# GOVERNMENT POLYTECHNIC NASHIK

(AN AUTONOMOUS INSTITUTE OF GOVT. OF MAHARASHTRA)

# CURRICULUM 2016

# DIPLOMA PROGRAMME
IN
# COMPUTER TECHNOLOGY

# INDEX

# PREFACE

Government Polytechnic, Nashik is established in 1980. The institute has been conferred an academic autonomous status in 1995 by Government of Maharashtra because of excellent performance.

The vision of the institute is to develop professionally competent engineers for sustainable, socio-economical and community development with harmonious blending. For this the institute is committed to provide Diploma in engineering and technology, continuing education, and skill development programmes. The institute is also committed to create dynamic learning environment to achieve academic excellence and to provide testing and consultancy services to industry, business and community at large. To achieve this continuous efforts are made to design the curriculum considering the latest development in the industrial sector and technology.

The three year Diploma Programme in Computer Technology is being offered since 2001 under academic autonomy, first curriculum was implemented in 2001 and subsequently it was revised and implemented in 2007 and 2011. The curriculum revision is a regular activity and outcome based education approach is adopted for designing the curriculum. The revised outcome based curriculum is designated as "Curriculum 2016". The implementation of Curriculum 2016 will be effective from the academic year 2016- 17.

For designing the curriculum, the various domains have been identified. For Computer Technology Programme these domains are Software Development (Programming), Operating System and PC Architecture and maintenance, Software Testing and Engineering, Database Management System, Computer Network and Security, Embedded System, System Software and Computer Graphics. The questionnaire has been designed to get the responses from these domain areas from different stake holders i.e. industries, teachers and students. The feedback from different stake holders has been analysed and roles, functions, activities, tasks and attitudes necessary for Diploma Engineer in Computer Technology have been identified. The programme structure is finalised and the content detailing of individual course has been carried out by group of experts, and approved by Programme Wise Committee (PWC), Board of Studies (BOS) and Governing Body (GB).

In this Curriculum-2016, the student has to acquire 200 credits for successful completion of Diploma Programme. The courses of curriculum are structured at different 5 levels i.e. Foundation Courses, Basic Technology Courses, Allied Courses, Applied Technology Courses and Diversified Courses.

The minimum entry level is 10th. However, the curriculum provides "Multi Point Entry and Credit system (MPEC)" for the students opting admission after passing 12th, ITI, MCVC. At higher entry level, the students will get exemptions in certain courses as per the rules.

There is a flexibility for opting the courses as per the choice of students. The curriculum provides "Sample Path" as a guide line for selection of courses in each term for entry level as 10th.

The List of Courses for Award of Class after completion of Diploma Programme is prescribed separately in this curriculum.

The fulfilment of programme outcome as stated in the Curriculum-2016 will depend on its effective implementation. The teachers who are implementing the curriculum were also involved in the design process of curriculum, hence, I hope that the Curriculum-2016 will be implemented in effective way and the passouts will acquire the requisite knowledge and skills to satisfy the industrial needs.

(Prof. DNYANDEO PUNDALIKRAO NATHE)
Principal
Government Polytechnic, Nashik

# GOVERNMENT POLYTECHNIC NASHIK

## VISION

To be a premier technical institute developing professionally competent engineers for sustainable, socio-economical and community development with harmonious blending

## MISSION

Institute is committed to

- Provide Diploma in engineering and technology, continuing education and skill development programmes.
- Provide testing and consultancy services to industry, business and community at large.
- Create dynamic learning environment to achieve academic excellence.

## VALUES

- Professionalism and integrity
- Responsibility and accountability
- Continuous improvement
- Collaboration and team work

## COMPUTER TECHNOLOGY DEPARTMENT

### VISION

To achieve quality education to deal with rapidly changing technologies which produce creative manpower those who can address the global challenges and excel at an International level.

### MISSION

Department of Computer Technology is committed

M1. To make the student to Anticipate and respond effectively.
M2. To develop innovative skills and act robust and reliable ways to solve the engineering problems ethically with integrity.
M3. To secure technological and decision-support services and applications to inspire student.
M4. To empower employers, stake holders, and ultimately advance the state of education in the nation.
M5. To encourage student for employable, entrepreneurial, and life- long learning skill and develop leadership skills with social sensitivity.

## JOB PROFILE FOR COMPUTER TECHNOLOGY DIPLOMA PASSOUTS

A Diploma Engineer in Computer Technology has to carry out various activities in various areas during his implementation of engineering knowledge.

Computer Technology job opportunities are available in following domains:

a. Software Development (Programming)
b. Operating System and PC Architecture and Maintenance
c. Software Testing and Engineering
d. Database Management System
e. Computer Network and Security
f. Embedded System
g. System Software
h. Computer Graphics

In above domain areas Diploma Engineer in Computer Technology has to perform following duties.

1 Computer Programmer.
2 Web Designer.
3 Network administrator.
4 Data base administrator.
5 Software consultant.
6 Customer support engineer.
7 Hardware engineer.
8 Computer tutor and operator.
9 Technical Lab Assistant
10 Desktop Engineer.

# DIPLOMA PROGRAMME IN COMPUTER TECHNOLOGY

# RATIONALE

Now a day Computer Technology is having a high potential in Industries. It has got prime importance not only in India but worldwide. India is developing as a I.T. super power in today's world. With a great potential for employment in industries, the requirement for computer technocrats by industry is increasing rapidly. Computer industry also contributes to largest foreign currency income to government resulting in economic growth. A Diploma Engineer in Computer Technology has also got worldwide employment opportunities.

In today's world, all organizations are adapting computerization for improving quality economically. So, software development is going to be major activity in future leading to requirement of software developers along with need of Hardware and Software maintenance engineers.

## PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

I. To produce innovative technical leaders those are able to contribute towards achievement of computer technology.
II. Students will be able to lead a team of diversified professionals with good communication skills, leadership virtues and professional ethics.
III. Students will have the capability to identify social issues or crisis or problems or calamities and will be able to find solutions by applying concepts of computer technology.
IV. Students will able to apply mathematics and scientific concepts for formulating analyzing and solving real world problems of engineering.

## PROGRAMME OUTCOMES (POs)

On Successful Completion, Diploma Passouts will be able to

a. **Basic knowledge:** An ability to apply knowledge of mathematics, science and engineering fundamentals to solve real world problems using computer technology.

b. **Discipline knowledge:** An ability to indentify, formulate, and solve real world problems by applying fundamentals of computer technologies.

c. **Experiments & Practice:** Ability to undertake, analyze, interpret and solve a specific real world problem by applying various domains like database, Networking, programming methodologies and Operating System principles.

d. **Engineering Tools:** An ability to identify and use various programming Frameworks, IDE's, Plugin's, Networking tools, Web platform tools for development and maintenance of software's and network.

e. **The Engineer & Society:** Ability to understand society troubles and resolve them by applying IT technologies.

f. **Environment & Sustainability:** Understand the impact of professional engineering solutions in societal and environmental context, and demonstrate the knowledge of, and need for sustainable development.

g. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of computer engineering practices in managing computer technology resources and in providing computer solutions and services.

h. **Individual & Team Work:** Function effectively, individually and in multidisciplinary team to accomplish common goals with leadership qualities.

i. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.

j. **Project Management & Finance:** Demonstrate knowledge and understanding engineering and management principles to manage projects in multidisciplinary environment

k. **Lifelong Learning:** Recognize the need and be adaptable for independent and life-long learning in the context of technological changes.

## MAPPING OF MISSION AND PROGRAMME EDUCATIONAL OBJECTIVES

| Sr. No. | Mission | Component of Mission Statement | PEO/s |
|---|---|---|---|
| 1 | M1 | To make the student to Anticipate and respond effectively. | I, II, IV |
| 2 | M2 | To develop innovative skills and act robust and reliable ways to solve the engineering problems ethically with integrity. | II, IV |
| 3 | M3 | To secure technological and decision-support services and applications to inspire student. | III |
| 4 | M4 | To empower employers, stake holders, and ultimately advance the state of education in the nation. | I, II, |
| 5 | M5 | To encourage student for employable, entrepreneurial, and life- long learning skill and develop leadership skills with social sensitivity. | III |

## MAPPING OF PROGRAMME EDUCATIONAL OBJECTIVES AND PROGRAMME OUTCOMES

| Sr. No. | Programme Educational Objectives (PEOs) | Programme Outcomes (POs) |
|---|---|---|
| 1 | I. To produce innovative technical leaders those are able to contribute towards achievement of computer technology. | a, b, j, i |
| 2 | II. Students will be able to lead a team of diversified professionals with good communication skills, leadership virtues and professional ethics. | e, f, g, h, j |
| 3 | III. Students will have the capability to identify social issues or crisis or problems or calamities and will be able to find solutions by applying concepts of computer technology. | c, d, e, i, k, h, |
| 4 | IV. Students will able to apply mathematics and scientific concepts for formulating analyzing and solving real world problems of engineering. | a, b, c, d, i |

## MAPPING OF PROGRAMME OUTCOME AND COURSES

| Pos No. | Program Outcome (POs) | Course Name |
|---|---|---|
| **a** | **Basic knowledge:** An ability to apply knowledge of mathematics, science and engineering fundamentals to solve real world problems using computer technology | Basic Mathematics<br>Engineering Mathematics<br>Applied Physics<br>Applied Chemistry<br>Engineering Graphics<br>Applied Mathematics |
| **b** | **Discipline knowledge:** An ability to indentify, formulate, and solve real world problems by applying fundamentals of computer technologies. | Computer Fundamentals<br>Elements of Electronics<br>Fundamentals of Electrical Technology<br>Programming in C<br>Database Management systems<br>Microprocessor<br>Data Structure Using 'C'<br>PC Architecture and Maintenance |
| **c** | **Experiments & Practice:** Ability to undertake, analyze, interpret and solve a specific real world problem by applying various domains like database, Networking, programming methodologies and Operating System principles**.** | Java Programming<br>Advanced Java<br>ASP.NET<br>Advance Database Management system<br>PHP Programming<br>Object Oriented Programming<br>Microcontroller and Embedded Systems<br>Linux Operating System<br>Mobile Computing and Application Development |
| **d** | **Engineering Tools:** An ability to identify and use various programming Frameworks, IDE's, Plugin's, Networking tools, Web platform tools for development and maintenance of software's and network. | Software Engineering<br>Object Oriented Modeling and Design<br>Network Administration and Management<br>Computer Network<br>Software Testing<br>Web Page Designing<br>Scripting Technology<br>VB .NET |
| **e** | **The Engineer & Society:** Ability to understand society troubles and resolve them by applying IT technologies. | Software Engineering<br>Object Oriented Modeling and Design<br>Software Testing<br>Computer Graphics |

| Pos No. | Program Outcome (POs) | Course Name |
|---|---|---|
| | | Computer Security<br>Project<br>Seminar<br>Operating System<br>System Software<br>Digital Techniques |
| **f** | **Environment & Sustainability:** Understand the impact of professional engineering solutions in societal and environmental context, and demonstrate the knowledge of, and need for sustainable development. | Environmental Studies<br>Software Testing |
| **g** | **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of computer engineering practices in managing computer technology resources and in providing computer solutions and services | Professional Practices<br>Industrial Organization and Management |
| **h** | **Individual & Team Work:** Function effectively, individually and in multidisciplinary team to accomplish common goals with leadership qualities. | Professional Practices<br>Entrepreneurship Development<br>Project<br>Seminar |
| **i** | **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write | Communication Skills<br>Development of Life Skills<br>Computer Fundamentals and Organization<br>Seminar |

| Pos No. | Program Outcome (POs) | Course Name |
|---|---|---|
| | effective reports and design documentation, make effective presentations and give and receive clear instructions. | |
| **j** | **Project Management & Finance:** Demonstrate knowledge and understanding engineering and management principles to manage projects in multidisciplinary environment. | Project<br>E-Commerce<br>Industrial Organization and Management<br>Marketing Management |
| **k** | **Lifelong Learning:** Recognize the need and be adaptable for independent and life-long learning in the context of technological changes. | Professional Practices<br>Seminar and Project synopsis<br>Entrepreneurship Development<br>Project |

**PROGRAMME - DIPLOMA IN COMPUTER TECHNOLOGY**
**PROGRAMME STRUCTURE**

**SCHEME AT A GLANCE**

| Level | Name of Level | Total Number of Courses offered | Number of Courses to be completed | TH | TU | PR | Total Credits | Marks |
|---|---|---|---|---|---|---|---|---|
| Level-1 | Foundation courses | 11 | 11 Compulsory | 30 | 02 | 24 | 56 | 1150 |
| Level-2 | Basic Technology Courses | 09 | 09 Compulsory | 26 | -- | 28 | 54 | 1300 |
| Level-3 | Allied courses | 07 | 05 (03 Compulsory +02 Electives) | 10 | -- | 04 | 14 | 400 |
| Level-4 | Applied Technology Courses | 09 | 09 Compulsory | 17 | -- | 22 | 39 | 850 |
| Level-5 | Diversified Courses | 12 | 06 Electives | 17 | -- | 20 | 37 | 800 |
| **TOTAL** | | **48** | **32 Compulsory +08 Electives -- 40** | **100** | **02** | **98** | **200** | **4500** |

**Abbreviations:**
TH: Theory, TU: Tutorial, PR: Practical.

**PROGRAMME - DIPLOMA IN COMPUTER TECHNOLOGY**
**PROGRAMME STRUCTURE**
**LEVEL – 1**
**FOUNDATION COURSES**

| Sr No | Course Code | Course Title | Course Abbr | TEACHING SCHEME | | | | EXAMINATION SCHEME | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | TH | TU | PR | Total Credits | Theory Paper | | Test | PR | OR | TW | Total |
| | | | | | | | | Hrs | Mark | | | | | |
| 01 | 6101 | Communication Skills | CMS | 03 | -- | 02 | 05 | 03 | 80 | 20 | -- | -- | 50 | 150 |
| 02 | 6102 | Development of Life Skills | DLS | 01 | -- | 02 | 03 | -- | -- | -- | -- | -- | 50 | 50 |
| 03 | 6103 | Basic Mathematics | BMT | 03 | 01 | -- | 04 | 02 | 80# | 20# | -- | -- | -- | 100 |
| 04 | 6104 | Engineering Mathematics | EMT | 03 | 01 | -- | 04 | 02 | 80# | 20# | -- | -- | -- | 100 |
| 05 | 6105 | Applied Physics | PHY | 04 | -- | 02 | 06 | 02 | 80# | 20# | -- | -- | 50 | 150 |
| 06 | 6106 | Applied Chemistry | CHY | 04 | -- | 02 | 06 | 02 | 80# | 20# | -- | -- | 50 | 150 |
| 07 | 6107 | Engineering Graphics | EGR | 02 | -- | 04 | 06 | -- | -- | -- | 25 | -- | 25 | 50 |
| 08 | 6113 | Fundamentals of Electrical Technology | FET | 04 | -- | 02 | 06 | 03 | 80 | 20 | -- | -- | 50 | 150 |
| 09 | 6117 | Computer Fundamentals and Organization | CFO | 02 | -- | 04 | 06 | -- | -- | -- | -- | -- | 50 | 50 |
| 10 | 6118 | Elements of Electronics | EOE | 04 | -- | 02 | 06 | 03 | 80 | 20 | -- | -- | 50 | 150 |
| 11 | 6119 | Computer Workshop Practice | CWP | -- | -- | 04 | 04 | -- | -- | -- | -- | -- | 50 | 50 |
| **TOTAL** | | | **--** | **30** | **02** | **24** | **56** | **--** | **560** | **140** | **25** | **--** | **425** | **1150** |

**Level: 1**

Total Courses : 11
Total Credits : 56
Total Marks : 1150

**Abbreviations:**

Abbr : Course Abbreviation, TH: Theory, TU: Tutorial, PR: Practical, OR: Oral, TW: Term Work, #: Online Examination

**Course code Indication :**

First digit : Indicates last digit of Year of Implementation of Curriculum
Second digit : Indicates Level.
Third & Fourth digit : Indicates Course Number.

**Assessment of PR / OR / TW :**

1) All orals & practicals are to be assessed by external & internal examiners.
2) * Indicates TW to be assessed by external & internal examiners.
3) Other TW are to be assessed by internal examiners.
4) # indicates Online theory Examination

**PROGRAMME - DIPLOMA IN COMPUTER TECHNOLOGY**
**PROGRAMME STRUCTURE**
**LEVEL – 2**
**BASIC TECHNOLOGY COURSES**

| Sr No | Course Code | Course Title | Course Abbr | TEACHING SCHEME | | | | EXAMINATION SCHEME | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | TH | TU | PR | Total Credits | Theory Paper | | Test | PR | OR | TW | Total |
| | | | | | | | | Hrs | Mark | | | | | |
| 01 | 6234 | Microprocessor | MPO | 04 | -- | 02 | 06 | 03 | 80 | 20 | -- | -- | 25 | 125 |
| 02 | 6235 | Data Structures Using 'C' | DST | 03 | -- | 04 | 07 | 03 | 80 | 20 | 50 | -- | 25 | 175 |
| 03 | 6236 | Database Management Systems | DBM | 03 | -- | 04 | 07 | 03 | 80 | 20 | 25 | -- | 25 | 150 |
| 04 | 6237 | Programming in C | PIC | 03 | -- | 04 | 07 | 03 | 80 | 20 | 25 | -- | 25 | 150 |
| 05 | 6238 | Object Oriented Programming | OOP | 03 | -- | 04 | 07 | 03 | 80 | 20 | 50 | -- | 25 | 175 |
| 06 | 6239 | PC Architecture and Maintenance | PCM | 03 | -- | 02 | 05 | 03 | 80 | 20 | -- | 25 | 25 | 150 |
| 07 | 6241 | Web Page Designing | WPD | 01 | -- | 04 | 05 | -- | -- | -- | 50 | -- | 50 | 100 |
| 08 | 6242 | Operating System | OPS | 03 | -- | 02 | 05 | 03 | 80 | 20 | -- | -- | 25 | 125 |
| 09 | 6243 | Computer Network | CPN | 03 | -- | 02 | 05 | 03 | 80 | 20 | -- | 25 | 25 | 150 |
| **TOTAL** | | | **--** | **26** | **-** | **28** | **54** | **--** | **640** | **160** | **200** | **50** | **250** | **1300** |

**Level: 2**

Total Courses : 09
Total Credits : 54
Total Marks : 1300

**Assessment of PR / OR / TW:**

1) All orals & practical's are to be assessed by external & internal examiners.
2) * Indicates TW to be assessed by external & internal examiners.
3) Other TW are to be assessed by internal examiners.

**PROGRAMME - DIPLOMA IN COMPUTER TECHNOLOGY**
**PROGRAMME STRUCTURE**
**LEVEL – 3**
**ALLIED COURSES**

| Sr No | Course Code | Course Title | Course Abbr | TEACHING SCHEME | | | | EXAMINATION SCHEME | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | TH | TU | PR | Total Credits | Theory Paper | | Test | PR | OR | TW | Total |
| | | | | | | | | Hrs | Mark | | | | | |
| 01 | 6301 | Applied Mathematics | AMT | 03 | -- | -- | 03 | 03 | 80 | 20 | -- | -- | -- | 100 |
| 02 | 6302 | Environmental Studies | EVS | -- | -- | 02 | 02 | -- | -- | -- | -- | -- | 50 | 50 |
| 03 | 6303 | Industrial Organization and Management | IOM | 03 | -- | -- | 03 | 03 | 80 | 20 | -- | -- | -- | 100 |
| **Elective I** : Any **ONE** of the following | | | | | | | | | | | | | | |
| 04 | 6305 | Supervisory Skills | SSL | 03 | -- | -- | 03 | 03 | 80 | 20 | -- | -- | -- | 100 |
| | 6306 | Marketing Management | MKM | 03 | -- | -- | 03 | 03 | 80 | 20 | -- | -- | -- | 100 |
| **Elective I** : Any **ONE** of the following | | | | | | | | | | | | | | |
| 05 | 6309 | Entrepreneurship Development | EDP | 01 | -- | 02 | 03 | -- | -- | -- | -- | -- | 50 | 50 |
| | 6315 | E-Commerce | ECM | 01 | -- | 02 | 03 | -- | -- | -- | -- | -- | 50 | 50 |
| **TOTAL** | | | -- | **10** | -- | **04** | **14** | **--** | **240** | **60** | -- | -- | **100** | **400** |

**Level: 3**

Total Courses : 05 / 07
Total Credits : 14
Total Marks : 400

**Assessment of PR / OR / TW:**

1) All orals & practical's are to be assessed by external & internal examiners.
2) * Indicates TW to be assessed by external & internal examiners.
3) Other TW are to be assessed by internal examiners.

**PROGRAMME - DIPLOMA IN COMPUTER TECHNOLOGY**
**PROGRAMME STRUCTURE**
**LEVEL – 4**
**APPLIED TECHNOLOGY COURSES**

| Sr No | Course Code | Course Title | Course Abbr | TEACHING SCHEME | | | | EXAMINATION SCHEME | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | TH | TU | PR | Total Credits | Theory Paper | | Test | PR | OR | TW | Total |
| | | | | | | | | Hrs | Mark | | | | | |
| 01 | 6410 | Professional Practices | PPR | -- | -- | 04 | 04 | -- | -- | -- | -- | -- | 50 | 50 |
| 02 | 6411 | Seminar | SEM | -- | -- | 02 | 02 | -- | -- | -- | -- | -- | 50 | 50 |
| 03 | 6412 | Project | PRO | -- | -- | 04 | 04 | -- | -- | -- | -- | 50 | 50* | 100 |
| 04 | 6434 | Software Engineering | SWE | 03 | -- | -- | 03 | 03 | 80 | 20 | -- | -- | -- | 100 |
| 05 | 6436 | Digital Techniques | DTE | 03 | -- | 02 | 05 | 03 | 80 | 20 | -- | -- | 25 | 125 |
| 06 | 6437 | Java Programming | JPR | 03 | -- | 04 | 07 | 03 | 80 | 20 | 25 | -- | 25 | 150 |
| 07 | 6438 | Software Testing | STG | 03 | -- | 02 | 05 | 03 | 80 | 20 | -- | -- | 25 | 125 |
| 08 | 6439 | Scripting Technology | SPT | 02 | -- | 04 | 06 | -- | -- | -- | 25 | -- | 25 | 50 |
| 09 | 6440 | System Software | SSW | 03 | -- | -- | 03 | 03 | 80 | 20 | -- | -- | -- | 100 |
| **TOTAL** | | | -- | **17** | -- | **22** | **39** | -- | **400** | **100** | **50** | **50** | **250** | **850** |

**Level: 4**

Total Courses : 09
Total Credits : 39
Total Marks : 850

**Assessment of PR / OR / TW :**

1) All orals & practical's are to be assessed by external & internal examiners.
2) Other TW are to be assessed by internal examiners.
3) * Indicates TW to be assessed by external & internal examiners.

**PROGRAMME - DIPLOMA IN COMPUTER TECHNOLOGY**
**PROGRAMME STRUCTURE**
**LEVEL – 5**
**DIVERSIFIED COURSES**

| Sr No | Course Code | Course Title | Course Abbr | TEACHING SCHEME | | | | EXAMINATION SCHEME | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | TH | TU | PR | Total Credits | Theory Paper | | Test | PR | OR | TW | Total |
| | | | | | | | | Hrs | Mark | | | | | |
| **Elective III**: Any **ONE** of the following | | | | | | | | | | | | | | |
| 01 | 6537 | Object Oriented Modeling and Design | OOM | 03 | -- | 02 | 05 | 03 | 80 | 20 | -- | 25 | 25 | 150 |
| 02 | 6539 | Advance Database Management | ADM | 03 | -- | 02 | 05 | 03 | 80 | 20 | -- | 25 | 25 | 150 |
| 03 | 6549 | Computer Security | CSC | 03 | -- | 02 | 05 | 03 | 80 | 20 | -- | 25 | 25 | 150 |
| **Elective IV**: Any **FOUR** of the following | | | | | | | | | | | | | | |
| 04 | 6540 | ASP.NET Technology | ASP | 03 | -- | 04 | 07 | 03 | 80 | 20 | -- | 25 | 25 | 150 |
| 05 | 6541 | PHP Programming | PHP | 03 | -- | 04 | 07 | 03 | 80 | 20 | -- | 25 | 25 | 150 |
| 06 | 6542 | Mobile Computing and Application Development | MCD | 03 | -- | 04 | 07 | 03 | 80 | 20 | -- | 25 | 25 | 150 |
| 07 | 6544 | Advanced Java | ADJ | 03 | -- | 04 | 07 | 03 | 80 | 20 | -- | 25 | 25 | 150 |
| | 6545 | Linux Operating System | LOS | 03 | -- | 04 | 07 | 03 | 80 | 20 | -- | 25 | 25 | 150 |
| | 6550 | Microcontroller and Embedded Systems | MCE | 03 | -- | 04 | 07 | 03 | 80 | 20 | -- | 25 | 25 | 150 |
| **Elective V**: Any **ONE** of the following | | | | | | | | | | | | | | |
| 08 | 6546 | Network Administration and Management | NAM | 02 | -- | 02 | 04 | -- | -- | -- | -- | 25 | 25 | 50 |
| | 6548 | VB. NET Technology | VBN | 02 | -- | 02 | 04 | -- | -- | -- | -- | 25 | 25 | 50 |
| | 6551 | Computer Graphics | CGR | 02 | -- | 02 | 04 | -- | -- | -- | -- | 25 | 25 | 50 |
| **TOTAL** | | | -- | **17** | **--** | **20** | **37** | **--** | **400** | **100** | **--** | **150** | **150** | **800** |

**Level: 5**

Total Courses : 08 / 12
Total Credits : 37
Total Marks : 800

**Assessment of PR / OR / TW:**

1) All orals & practical's are to be assessed by external & internal examiners.
2) * Indicates TW to be assessed by external & internal examiners.
3) Other TW are to be assessed by internal examiners.

**PROGRAMME - DIPLOMA IN COMPUTER TECHNOLOGY**
**Courses for Award of Class**

| Sr No | Course Code | Course Title | Course Abbr | TEACHING SCHEME | | | | EXAMINATION SCHEME | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | TH | TU | PR | Total Credits | Theory Paper | | Test | PR | OR | TW | Total |
| | | | | | | | | Hrs | Mark | | | | | |
| 01 | 6235 | Data Structures Using 'C' | DST | 03 | -- | 04 | 07 | 03 | 80 | 20 | 50 | -- | 25 | 175 |
| 02 | 6236 | Database Management Systems | DBM | 03 | -- | 04 | 07 | 03 | 80 | 20 | 25 | -- | 25 | 150 |
| 03 | 6243 | Computer Network | CPN | 03 | -- | 02 | 05 | 03 | 80 | 20 | -- | 25 | 25 | 150 |
| 04 | 6303 | Industrial Organization and Management | IOM | 03 | -- | -- | 03 | 03 | 80 | 20 | -- | -- | -- | 100 |
| 05 | 6411 | Seminar | SEM | -- | -- | 02 | 02 | -- | -- | -- | -- | -- | 50 | 50 |
| 06 | 6412 | Project | PPR | -- | -- | 04 | 04 | -- | -- | -- | -- | 50 | 50* | 100 |
| 07 | 6437 | Java Programming | JPR | 03 | -- | 04 | 07 | 03 | 80 | 20 | 25 | -- | 25 | 150 |
| 08 | 6438 | Software Testing | STG | 03 | -- | 02 | 05 | 03 | 80 | 20 | -- | -- | 25 | 125 |
| Any **FOUR** from **Elective IV** | | | | | | | | | | | | | | |
| 09<br>10<br>11<br>12 | 6540 | ASP.NET Technology | ASP | 03 | -- | 04 | 07 | 03 | 80 | 20 | | 25 | 25 | 150 |
| | 6541 | PHP Programming | PHP | 03 | -- | 04 | 07 | 03 | 80 | 20 | | 25 | 25 | 150 |
| | 6542 | Mobile Computing and Application Development | MCD | 03 | -- | 04 | 07 | 03 | 80 | 20 | | 25 | 25 | 150 |
| | 6544 | Advanced Java | ADJ | 03 | -- | 04 | 07 | 03 | 80 | 20 | | 25 | 25 | 150 |
| | 6545 | Linux Operating System | LOS | 03 | -- | 04 | 07 | 03 | 80 | 20 | | 25 | 25 | 150 |
| | 6550 | Microcontroller and Embedded Systems | MCE | 03 | -- | 04 | 07 | 03 | 80 | 20 | -- | 25 | 25 | 150 |
| **TOTAL** | | | -- | **30** | -- | **38** | **68** | -- | **800** | **200** | **100** | **175** | **325** | **1600** |

**# For project registration student must have acquired 100 credits at the time of registration.**

Total Courses : 12
Total Credits : 68
Total Marks : 1600

**PROGRAMME - DIPLOMA IN COMPUTER TECHNOLOGY**
**SAMPLE PATH**
**ENTRY LEVEL 10+**

| Nature of Course | First Year | | Second Year | | Third Year | | Total |
|---|---|---|---|---|---|---|---|
| | **Odd Term** | **Even Term** | **Odd Term** | **Even Term** | **Odd Term** | **Even Term** | |
| **Compulsory** | 6102 (03) DLS | 6101 (05) CMS | 6301 (03) AMT | 6238 (07) OOP | 6440 (03) SSW | 6412 (04) PRO | |
| | 6103 (04) BMT | 6104 (04) EMT | 6235 (07) DST | 6243 (05) CPN | 6411 (02) SEM | | |
| | 6105 (06) PHY | 6106 (06) CHY | 6236 (07) DBM | 6239 (05) PCM | 6438 (05) STG | | |
| | 6107 (06) EGR | 6118 (06) EOE | 6436 (05) DTE | 6234 (06) MPO | 6242 (05) OPS | | |
| | 6117 (06) CFO | 6237 (07) PIC | 6241 (05) WPD | 6303 (03) IOM | 6437 (07) JPR | | |
| | 6119 (04) CWP | 6113 (06) FET | 6410 (04) PPR | 6439 (06) SPT | | | |
| | 6302 (02) EVS | | | 6434 (03) SWE | | | |
| **Total credits** | **31** | **34** | **31** | **35** | **22** | **04** | **157** |
| **Elective** | --- | -- | Any **ONE** from **Elective: I**: 1. 6305 SSL(3) 2. 6306 MKM(3) **:(03)** | -- | Any **ONE** from **Elective: III**: 1. 6537 OOM (5) 2. 6549 CSC (5) 3. 6539 ADM (5) **:(05)** | Any **ONE** from **Elective: II**: 1. 6309 EDP(3) 2. 6315 ECM(3) **:(03)** | |
| | | | | | Any **ONE** from **Elective: V**: 1. 6546 NAM (4) 2. 6551 CGR (4) 3. 6548 VBN (4) **:(04)** | Any **FOUR** from **Elective : IV** : 1. 6540 ASP (7) 2. 6541 PHP (7) 3. 6542 MCD (7) 4. 6544 ADJ (7) 5. 6545 LOS (7) 6. 6550 MCE (7) **(28)** | |
| **Total Credits (Elect.)** | **---** | **---** | **03** | **--** | **09** | **31** | **43** |
| **Total Courses** | **07** | **06** | **07** | **07** | **07** | **06** | **40** |
| **Total Credits (Comp+Elect.)** | **31** | **34** | **34** | **35** | **31** | **35** | **200** |
| **Grand Total of Credits** | | | | | | | **200** |

**Note: Figures in bracket indicates total credits.**

**PROGRAMME** : Diploma Programme in CE / ME / PS / EE / IF / CM / EL / AE / DD / ID
**COURSE** : Communication Skills (CMS) **COURSE CODE** : 6101

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 03 | -- | 02 | 05 | 03 | Max. | 80 | 20 | 100 | -- | -- | 50 | 150 |
| | | | | | Min. | 32 | -- | 40 | -- | -- | 20 | -- |

## 1.0 RATIONALE:

Proficiency in English is one of the basic needs of technical students hence this curriculum aims at developing the functional and communicative abilities of the students. As Communication skills play a decisive role in the career development and entrepreneurship this course will guide and direct to develop a good personality and effective communication too. This course is compiled with an aim of shaping minds of engineering students while catering to their needs.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Understand & use basic concepts of Communication in an organisation and social context.
2. Use reasonably and grammatically correct English language with reading competency.
3. Utilise the skills to be a competent communicator.
4. Develop comprehension skills, improve vocabulary and acquire writing skills.
5. Overcome language and communication barriers with the help of effective communication techniques.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Apply the process and identify types of Communication for being an effective communicator
2. Identify the barriers in the communication process and apply ways to overcome them
3. Observe and interpret graphical information precisely
4. Acquire formal written skills for business correspondence.
5. Enhance listening & reading skills for improving competencies in communication.
6. Pronounce English sounds with correct stress and intonation in day to day conversations.
7. Construct correct grammatical sentences in oral and written communication.

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Communication** | 1a. Define communication & objectives<br>1b. Describe the process of Communication<br>1c. Differentiate between types of communication | 1.1 Meaning of communication: definition, objectives and Importance of communication<br>1.2 Elements/Process of communication<br>1.3 Types of communication: Formal, Informal, Verbal, Nonverbal, vertical, Horizontal, Diagonal | 04 |
| **Unit-II** | 2a. Explain types of barriers | 2.1 Barriers to Communication<br>a) Physical Barrier | 04 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Communication Barriers** | 2b. Describe the principles of effective communication<br>2c. Discuss ways to overcome barriers.<br>2d. Identify various barriers | • Environmental(time, noise, distance and surroundings)<br>• Personal(deafness, stammering, ill-health, spastic, bad handwriting, temporary physical disabilities)<br>b) Mechanical: Machines/means oriented<br>c) Psychological : Day dreaming prejudice, emotional, blocked mind, generation gap, status, inactiveness, perception<br>d) Language: Difference in language, technical jargons pronunciation and allusion<br>2.2 Ways to overcome barriers<br>2.3 Principles of effective communication | |
| **Unit-III**<br><br>**Nonverbal & Graphical communication** | 3a. Explain use of body language in oral conversations<br>3b. Label and interpret the graphical information correctly<br>3c. Describe the importance of graphical and nonverbal methods in technical field. | 3.1 Non-verbal codes:<br>• Proxemics<br>• Chronemics<br>• Artefacts<br>3.2 Aspects of body language(Kinesics)<br>3.3 Graphical communication<br>• Advantages and disadvantages of graphical communication<br>• Tabulation of data and its depiction in the form of bar graphs and pie charts. | 06 |
| **Unit-IV**<br><br>**Formal Written Communication** | 4a. Develop notices, circulars and emails<br>4b. Draft letters on given topics<br>4c. Prepare technical reports.<br>4d. Develop various types of paragraphs. | 4.1 Office Drafting :Notice, Memo, Circulars and e-mails<br>4.2 Job application and resume<br>4.3 Business correspondence : Enquiry, Reply to an enquiry order, complaint, adjustment,<br>4.4 Technical Report Writing : Accident report, Fall in Production / survey, progress Investigation / maintenance<br>4.5 Paragraph writing -Types of paragraphs<br>• Descriptive<br>• Technical<br>• Expository | 12 |
| **Unit-V**<br><br>**Listening skills** | 5a. Differentiate between hearing and listening.<br>5b. Apply techniques of effective listening. | 5.1 Listening versus hearing<br>5.2 Merits of good listening<br>5.3 Types of listening<br>5.4 Techniques of effective listening | 02 |
| **Unit-VI**<br><br>**Reading Skills** | 6a. Describe various methods to develop vocabulary<br>6b. Develop reading competencies. | 6.1 Reading for comprehension<br>6.2 Reading styles<br>6.3 Developing vocabulary<br>6.4 Methods of word formation: prefixes, suffixes, collocations, synonyms, | 06 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | 6c. Explain steps to comprehend passage | antonyms, Homophones, Homonyms.<br>6.5 Comprehension of unseen passages | |
| **Unit-VII**<br><br>**Speaking Skills** | 7a. Demonstrate Correct Pronunciation, stress and intonation in everyday conversation<br>7b. Develop formal conversational techniques.<br>7c. Deliver different types of speech | 7.1 Correct Pronunciation -Introduction to sounds vowels, consonants, stress, intonation<br>7.2 Conversations :<br>• Meeting & Parting<br>• Introducing & influencing requests<br>• Agreeing & disagreeing<br>• Formal enquiries<br>7.3 Speech-Types of speech<br>• Welcome Speech<br>• Farewell speech<br>• Vote of thanks | 06 |
| **Unit-VIII**<br><br>**Language Grammar** | 8a. Use grammatically correct sentence in day to day oral and written communication<br>8b. Distinguish between determiners & apply correctly in communicative use<br>8c. Use correct verb for given course.<br>8d. Use appropriate preposition as per time, place and direction.<br>8e. Transform the sentences. | 8.1 Tense<br>• Present Tense(Simple, Continuous, perfect, perfect Continuous)<br>• Past Tense(Simple, Continuous, perfect, perfect Continuous)<br>• Future Tense(Simple)<br>8.2 Determiners<br>• Articles (A, An, The)<br>• Some, Any, Much, Many, All, Both, Few, A few, The few, Little, A little, The little, Each, Every.<br>8.3 Modal Auxiliaries<br>Can, Could, May, Might, Shall, Should, Will, Would, Must, Have to, Need, ought to<br>8.4 Sentence Transformation<br>• Voice<br>• Degree<br>• Affirmative, Negative, Assertive,<br>8.5 Prepositions<br>• Time<br>• Place<br>• Direction<br>8.6 Conjunctions | 08 |
| | | **TOTAL** | **48** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

| Unit No. | Unit Title | Distribution of Theory Marks | | | |
|---|---|---|---|---|---|
| | | R Level | U Level | A and above Levels | Total Marks |
| I | Communication | -- | 02 | 04 | 06 |
| II | Communication Barriers | 02 | 02 | 02 | 06 |
| III | Nonverbal & Graphical communication | -- | 02 | 08 | 10 |
| IV | Formal Written Communication | -- | 04 | 18 | 22 |
| V | Listening Skills | -- | -- | 04 | 04 |
| VI | Reading Skills | -- | 02 | 06 | 08 |
| VII | Speaking Skills | 02 | 02 | 04 | 08 |
| VIII | Language Grammar | **--** | 04 | 12 | 16 |

| Unit No. | Unit Title | Distribution of Theory Marks | | | |
|---|---|---|---|---|---|
| | | R Level | U Level | A and above Levels | Total Marks |
| | **TOTAL** | **04** | **18** | **58** | **80** |

**Legends:** R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignment/task should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the desired programme outcome/course outcome.

***Note**: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in the mapping matrix for this course. Faculty should ensure that students also acquire Programme Outcomes/Course Outcomes related to affective domain.*

| Sr. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Hours |
|---|---|---|---|
| 1 | I | Communicate on the given topic/situation. | 02 |
| 2 | II | Identify communication barriers | 02 |
| 3 | III | Non-verbal communication | 02 |
| 4 | IV | Business letter writing &job application | 02 |
| 5 | IV | Draft official letter | 02 |
| 6 | IV | Technical report writing on given topic | 04 |
| 7 | V | Attend a seminar and preparing notes | 02 |
| 8 | VI | Vocabulary building with different methods | 02 |
| 9 | VII | Language lab Experiment for correct pronunciation of sounds | 04 |
| 10 | VII | Write & present conversations on given situations | 02 |
| 11 | VIII | Grammar application-various exercises on grammar | 04 |
| 12 | I to VIII | Mini project (on given topic) | 04 |
| | | **TOTAL** | **32** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Prepare charts on types of communication.
2. Convert language information in graphical or nonverbal codes.
3. Maintaining own dictionary of difficult words, words often confuse, homophones & homonyms.
4. Listening daily English news on television or radio & to summarise it in their language.

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Use audios of correct pronunciations.
2. Show videos about use of body language in oral formal conversations

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Effective English Communication | Krishna Mohan and Meenakshi Raman | Tata McGraw Hill Publishing Co. Ltd. |
| 2 | English for practical purpose | Z. N. Patil | Macmillan |
| 3 | Spoken English | Basal and Harrison | Orient Longman |
| 4 | Contemporary English Grammar | R. C. Jain, David Green | Macmillan |
| 5 | Business correspondence and Report writing | R. C. Sharma and Krishna Mohan | Tata McGraw Hill Publishing |
| 6 | English Communication for Polytechnics | S. Chandrashekhar & others | Orient Black Swan |
| 7 | Active English Dictionary | S. Chandrashekhar & others | Longman |

### B) Software/Learning Websites

1. http://www.communicationskills.co.in
2. http://www.mindtools.com
3. http://www.communication.skills4confidence
4. http://www.goodcommunication skills.net
5. http://www.free-english-study.com/
6. http://www.english-online.org.uk/
7. http://www.englishclub.com
8. http://www.learnenglish.de
9. http://www.talkenglish.com/
10. http://www.englishgrammarsecrets.com
11. http://www.myenglishpages.com/
12. http://www.effective-business-letters.com/
13. http://www.englishlistening.com/
14. http://www.class-central.com

### C) Major Equipment/ Instrument with Broad Specifications

1. Digital English Language Laboratory.
2. Computers for language laboratory software
3. Headphones with microphone

## 10.0 MAPPING MATRIX OF PO'S AND CO'S:

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i | j | k |
| CO1 | | | | | | | | | H | | M |
| CO2 | | | | | | | | | H | | M |
| CO3 | M | | | | | | | | H | | M |
| CO4 | | M | | | | | | | H | | M |
| CO5 | M | | | | | | | | H | | M |
| CO6 | | M | | | | | | | H | | |
| CO7 | M | | | | | | | | H | | M |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME :** Diploma Programme in CE / ME / PS / EE / IF / CM / EL /AE / DD / ID
**COURSE :** Development of Life Skills (DLS) **COURSE CODE :** 6102

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 01 | -- | 02 | 03 | -- | Max. | --- | -- | -- | -- | -- | 50 | 50 |
| | | | | | Min. | -- | -- | -- | -- | -- | 20 | -- |

## 1.0 RATIONALE:

This course will develop the student as an effective member of the team in the organization. It will develop the abilities and skills to perform at highest degree of quality. It enhances his/her capabilities in the field of searching, assimilating information, handling people effectively and solving challenging problems.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Develop the abilities and skills to perform at highest degree of quality as an individual as well as a member of core group or team.
2. Enhance capabilities in the field of searching, assimilating information, managing the given task, handling people effectively and solving challenging problems.
3. Understand and use personal management techniques.
4. Analyse their strengths, weaknesses, opportunities and threats.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Analyse self attitude and behaviour.
2. Acquire self learning techniques by using various information sources
3. Identify personal strengths to get future opportunities.
4. Develop presentation skills with the help of effective use of body language.
5. Enhance leadership traits and recognise the importance of team work.
6. Face interview without fear
7. Resolve conflict and solve problems by appropriate methods.
8. Set the goal for personal development.

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Self Analysis** | 1a. Explain types of Motivation.<br>1b. Differentiate between types of attitude.<br>1c. Describe types of behaviour<br>1d. Analyse SWOT of an individual | 1.1 Motivation-types, need<br>1.2 Attitude-types, tips for developing positive attitude<br>1.3 Behaviour-types-passive, assertive, aggressive<br>1.4 Confidence building-need, importance<br>1.5 SWOT analysis-(significance) | 02 |
| **Unit-II**<br><br>**Self Learning Techniques** | 2a. Explain the self learning techniques by enhancing memory and | 2.1 Need & importance of SLT<br>2.2 Information source-Primary, secondary, tertiary<br>2.3 Enhancing Memory and concentration | 02 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **( SLT**) | concentration<br>2b. Apply practical skills for effective learning<br>2c. Identify the information sources | 2.4 Learning Practical Skills- need of Practical Skills types of practical skills-technical, organisational, human Domains of learning 1)cognitive 2)Affective 3)psychomotor<br>2.5 information search techniques-library search, internet search | |
| **Unit-III**<br><br>**Self Development & management** | 3a. Explain the Need of self Management<br>3b. Set the goals for personal development | 3.1 Stress management-remedies to avoid, minimize stress<br>3.2 Health management –importance of Diet & exercise<br>3.3 Time management-time planning, tips for effective time management<br>3.4 Goal setting-need and importance<br>3.5 Creativity | 03 |
| **Unit-IV**<br><br>**Emotions** | 4a. Explain nature and types of human emotions<br>4b. Differentiate between cognitive and emotional intelligence | 4.1 Basic emotions-<br>4.2 Emotional intelligence<br>4.3 Emotional stability/maturity | 01 |
| **Unit-V**<br><br>**Presentation skills** | 5a. Develop presentation skills with the help of body language<br>5b. Describe utilisation of voice quality in oral conversations | 5.1 Body Language – Codes, dress and appearance, postures, gestures Facial expressions<br>5.2 Voice and language<br>5.3 Use of aids:-OHP, LCD projector, white board | 02 |
| **Unit-VI**<br><br>**Group discussion and interview techniques** | 6a. Participate in group discussion<br>6b. Face interview without fear. | 6.1 introduction to group discussion<br>6.2 ways to carry group discussion<br>6.3 Parameters-analytical, logical thinking, Decision making<br>6.4 Interview techniques Necessity, tips for handling common questions | 02 |
| **Unit-VII**<br><br>**Team work** | 7a. Recognise the importance of team work<br>7b. Enhance leadership qualities | 7.1 stages of team development<br>7.2 Understand and work with dynamic group<br>7.3 Ingredients of effective teams.<br>7.4 leadership in teams, handling frustration in group | 02 |
| **Unit-VIII**<br><br>**Conflicts & Problem Solving** | 8a. Describe sources of conflicts and resolve conflicts<br>8b. Develop lateral thinking abilities<br>8c. Identify innovative methods in solving Problems. | 8.1 sources of conflict<br>8.2 Resolution of conflict<br>8.3 ways to enhance interpersonal relation<br>8.4 Steps in problem solving<br>8.5 Problem solving techniques-trial, error & brainstorming | 02 |
| | | **TOTAL** | **16** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):-

Not Applicable

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

***Note**: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

| Sr. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. required |
|---|---|---|---|
| 1 | I | Self Introduction-giving personal details for introducing self | 02 |
| 2 | II | SLT-Access the book on biography of scientist/industrialist/invention from the library or internet | 02 |
| 3 | I | Deliver a seminar for 10 minutes using presentation aids. | 02 |
| 4 | IV | Prepare PowerPoint slides on given topic and make presentation | 02 |
| 5 | VII | Case study for problem solving in an organisation | 04 |
| 6 | V | Discuss a topic in a group & prepare minutes of discussion. | 02 |
| 7 | VI | Prepare questionnaire for your friend or any person in the organisation to check emotional intelligence. | 02 |
| 8 | VII | Goal setting for achieving the success-SMART goal. | 02 |
| 9. | I | SWOT Analysis for yourself with respect to your Strength, Weakness, Opportunities & Threats | 04 |
| 10 | III | Attend a seminar or a guest lecture and note down the important points and prepare a report of the same. | 02 |
| 11 | VIII | Undertake any social activity in a team and prepare a report about it(i.e. tree plantation, blood donation, environment protection, rain water harvesting) | 04 |
| 12 | III | Management of self-stress management, time management, health management | 04 |
| | | **TOTAL** | **32** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Preparing personal time table.
2. Performing YOGA as a routine part of daily life.
3. Practicing breathing exercises.
4. Improving concentration by chanting and meditation.
5. Focusing on behavior skills and mannerism
6. Searching information on internet and newspapers.
7. Concentrating on various aspects of personality development.

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Use of videos on personality development.
2. Use of power point presentation on health, time & stress management
3. Case study of an organization
4. Use of videos to show interviews of successful personalities.

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Make Every Minute Count | Marion E Haynes | Kogan Page India |
| 2 | Body language | Allen Pease | Sudha Publication Pvt. Ltd. |
| 3 | Presentation Skills | Michael Hatton | ISTE New Delhi |
| 4 | Organizational Behavior | Pearson Education Asia | Tata McGraw Hill |
| 5 | Working in Teams | Chakravarty, Ajanta | Orient Longman |
| 6 | Develop Your Assertiveness | Bishop, Sue | Kogan Page India |
| 7 | Adams Time Management | Marshall Cooks | Viva Books |
| 8 | Time Management | Chakravarty, Ajanta | Rupa and Company |
| 9 | Target setting & Goal Achievement | Richard hale, Peter whilom | Kogan page India |
| 10 | Creativity &problem solving | Lowe and Phil | Kogan page (I)P Ltd |
| 11 | Basic Managerial Skills for all | E. H. Mc Grah, S. J. | Prentice Hall of India, Pvt. Ltd. |

### B) Software/Learning Websites

1. http://www.mindtools.com
2. http://www.successconsciousness.com
3. http://www.studyhabits.com
4. http://www.motivateus.com
5. http://www.quickmba.com
6. http://www.success77.com
7. http://www.stress.org
8. http://www.topachievement.com
9. http://www.ethics.com
10. http://www.creativityforlife.com
11. http://www.motivation.com
12. http://www.queendom.com

### C) Major Equipment/ Instrument with Broad Specifications

Not Applicable

## 10.0 MAPPING MATRIX OF PO'S AND CO'S:

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i | j | k |
| CO1 | L | M | | | L | | L | M | H | | H |
| CO2 | M | M | | | L | L | H | | M | | H |
| CO3 | | | | | M | | M | M | H | | H |
| CO4 | L | L | | | L | M | M | | H | | M |
| CO5 | | | | | L | | M | M | H | M | L |
| CO6 | | L | | | L | M | | | H | | M |
| CO7 | L | | | | M | M | L | M | M | L | L |
| CO8 | L | L | | | L | M | L | L | H | | L |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME** : Diploma Programme CE / ME / PS / EE / IF / CM / EL / AE
**COURSE** : Basic Mathematics (BMT) **COURSE CODE** : 6103

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | Online Exam. Hrs. | Marks | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 03 | 01 | -- | 04 | 02 | Max. | 80# | 20# | 100 | -- | -- | -- | 100 |
| | | | | | Min. | 32 | -- | 40 | -- | -- | -- | -- |

**# indicates online examination**

## 1.0 RATIONALE:

This course is classified under foundation course and intends to teach the students basic facts, concepts and principles of Mathematics, as a tool to analyse the engineering problems and lay down the understanding of basic technology courses.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Acquire the knowledge of mathematical terms definitions, principles and procedure of algebra, trigonometry and co-ordinate geometry.
2. Develop the process of logical thinking.
3. Comprehend the principles of the other courses.
4. Solve problems by using analytical & systematic approach.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to apply mathematical definitions, principles and procedure to solve engineering and applied mathematical problem in

1. Logarithm
2. Determinant and matrix
3. Simultaneous equations in three variables
4. Partial fractions
5. Binomial theorem
6. Properties of triangle and solution of triangle
7. Coordinate geometry (straight lines and circle)

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Logarithm** | 1a. Define logarithm use it for conversion<br>1b. Apply laws of logarithm to solving problems<br>1c. Identify common logarithm and Naperian logarithm | 1.1 Concept and definition of Logarithm, conversion of exponential and logarithmic forms<br>1.2 Laws of logarithms and change of base formula<br>1.3 Common logarithm and **Naperian** logarithm definition and **notation only.** | 03 |
| **Unit-II**<br><br>**Determinant & Matrix Algebra** | 2a. Calculate determinant of order two and three and apply Cramer's Rule.<br>2b. Calculate area Of Triangle & condition of | 2.1 Determinant of order two and three, Cramer's Rule for Three Variables. Area of Triangle and Condition of Co linearity.<br>2.2 Definition of a matrix, types of matrix, algebra of matrices, equality of | 10 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | co linearity<br>2c. Define various types of matrices; solve problems using Algebra of matrix.<br>2d. Calculate Inverse of matrix | matrices, scalar multiplication, product of two matrices, Transpose of matrix.<br>2.3 Minor, cofactor and ad joint of matrix, Inverse of matrix by ad Joint matrix method. | |
| **Unit-III**<br>**Partial Fraction** | 3a. Identify proper & improper<br>3b. Resolve partial fraction method of Case I, Case II and Case III. | 3.1 Rational function, proper and Improper rational Functions<br>3.2 Concept of partial fraction.<br>Case-1 The denominator contains linear non repeated factors.<br>Case-2 the denominator contains linear but repeated factors<br>Case-3 the denominator contains quadratic irreducible factors | 05 |
| **Unit-IV**<br>**Binomial Theorem** | 4a. State Binomial Theorem for Positive integral Index.<br>4b. Use $T_{R+1}$ for finding middle term general term<br>4c. Use approximation Theorem for solving problems | 4.1 Binomial Theorem for positive integral index, formula for Tr+1, Middle term, particular term.<br>4.2 Binomial Theorem for rational and negative index (expansion up to four terms only), approximation theorem, simple problems | 04 |
| **Unit-V**<br>**Measurement Of Angle** | 5a. Conversion of sexagesimal systems & circular systems | 5.1 Measurement of angles, sexagesimal systems & circular systems, co-terminal angles, positive and negative angles, conversion of angle to radian to degree and degree to radians. | 02 |
| **Unit-VI**<br>**Trigonometric Ratios** | 6a. Calculate trigonometric ratios of any angle, Solve problem using fundamental Identities.<br>6b. Solving problem using allied, Compound, Multiple and Sub multiple forms. | 6.1 Trigonometric ratios of any angle, graph of trigonometric functions fundamental identities<br>6.2 Trigonometric ratios of allied, compound, multiple and sub multiple angles, sum &product forms. | 08 |
| **Unit-VII**<br>**Inverse Trigonometric Functions** | 7a. Convert & solving inverse trigonometry function<br>7b. Use of $\tan^{-1}x + \tan^{-1}y$ form to solve problem. | 7.1 Concept and definition of trig. Function, Relation between inverse trig. functions | 02 |
| **Unit-VIII**<br>**Properties Of Angle And Solution Of Triangle** | 8a. Use properties of triangle : Sine rule, Cosine rule to solve mathematical problems<br>8b. Solve any triangle problems | 8.1 Sine rule, cosine rule & law of tangent (simple problems)<br>8.2 solutions of triangle | 04 |
| **Unit-IX** | 9a. Calculate Slope, X and Y, intercept Use | 9.1 Slope and intercepts of straight line, various form of straight line, angle | 06 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Equation Of Straight Line** | various form of Straight line to solve problems. | between two lines, condition for two parallel or perpendicular lines, perpendicular distance formula, distance between two parallel lines. | |
| **Unit-X**<br><br>**Equation Of Circle** | 10a. Calculate Radius & Centre of general circle<br>10b. Apply various form of circle<br>10c. Calculate Equation of tangent & normal to the circle. | 10.1 Equation Of std. circle, center radius form, general form of circle, Diameter form of circle, equation of tangent and normal to the circle. | 04 |
| | | **TOTAL** | **48** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

| Unit No. | Unit Title | Distribution of Marks | | | |
|---|---|---|---|---|---|
| | | **R Level** | **U Level** | **A and above Levels** | **Total Marks** |
| I | Logarithm | 02 | 02 | 02 | 06 |
| II | Determinant And Matrix Algebra | 04 | 08 | 04 | 16 |
| III | Partial Fraction | 02 | 04 | 02 | 08 |
| IV | Binomial Theorem | 02 | 02 | 02 | 06 |
| V | Measurement Of Angle | 02 | 02 | -- | 04 |
| VI | Trigonometric Ratios | 04 | 04 | 04 | 12 |
| VII | Inverse Trigonometric Function | 02 | 02 | -- | 04 |
| VIII | Properties of Triangle And Solution Of Triangle | 02 | 02 | 04 | 08 |
| IX | Equation Of Straight Line | 02 | 04 | 04 | 10 |
| X | Equation Of Circle | 02 | 02 | 02 | 06 |
| | **TOTAL** | **24** | **32** | **24** | **80** |

## 6.0 ASSIGNMENTS/ TUTORIAL /TASKS

| Sr. No. | Unit No. | Batch wise Tutorial Exercises<br>**Tutorial:** Ten question of multiple choice with justification | Approx. Hrs. required |
|---|---|---|---|
| 1 | I | Logarithm | 01 |
| 2 | II | Determinant | 01 |
| 3 | II | Matrix Algebra | 02 |
| 4 | III | Partial Fraction | 01 |
| 5 | IV | Binomial Theorem | 02 |
| 6 | V | Measurement And Angle | 01 |
| 7 | VI | Trigonometric Ratios | 01 |
| 8 | VI | Trigonometric Ratios | 01 |
| 9 | VII | Inverse Trigonometric Ratios | 02 |
| 10 | VIII | Properties of Triangle And Solution Of Triangle | 01 |
| 11 | IX | Straight Line | 02 |
| 12 | X | Circle | 01 |
| | | **TOTAL** | **16** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Teacher guided self learning activities.
2. Applications to solve identified Engineering problems and use of Internet.

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any)::

Not Applicable

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Mathematics for polytechnic student (I) | S. P. Deshpande | Pune Vidyarthi Gruha |
| 2 | Trigonometry | S. L. Loney | S. Chand |
| 3 | Higher Engineering Mathematics | B. S. Grewal | Khanna |
| 4 | College Algebra | F.G. Valles | Charter Publication. |
| 5 | Higher Algebra | H. S. Halls & S.R. Night | |
| 6 | Matrices | F. Ayers | Schan Series. Metric Edition Book, Palace of India. |

### B) Software/Learning Websites

1. http://www.mathsisfun.com
2. http://mathinsight.org/logarithm_basics
3. http://www.mathportal.org/linear-algebra/determinants/determinant-of-a-matrix.php
4. http://www.math.hmc.edu/calculus/tutorials/matrixalgebra/
5. http://ibgwww.colorado.edu/~carey/p7291dir/handouts/matrix.algebra.pdf
6. http://www.purplemath.com/modules/binomial2.htm
7. http://www.themathpage.com/atrig/line.htm
8. http://i1.dainikbhaskar.com/web2images/education/maths_13659_13897.pdf
9. http://mathworld.wolfram.com/InverseTrigonometricFunctions.html
10. http://aieee.examcrazy.com/maths/formula-tips/Co-ordinate-Geometry-circle.asp

### C) Major Equipment/ Instrument with Broad Specifications

1. Scientific Calculator
2. Computer system with Printer and Internet system.
3. LCD Projector

## 10.0 MAPPING MATRIX OF PO'S AND CO'S::

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i | j | k |
| CO1 | H | | M | | | | | | | | L |
| CO2 | H | | M | | | | | | | | L |
| CO3 | H | | L | | | | | | | | L |
| CO4 | H | | L | | | | | | | | L |
| CO5 | H | | M | | | | | | | | L |
| CO6 | H | | M | | | | | | | | L |
| CO7 | H | | M | | | | | | | | L |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME** : Diploma Programme CE / ME / PS / EE / IF / CM / EL / AE
**COURSE** : Engineering Mathematics (EMT) **COURSE CODE** : 6104

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | Online Exam Hrs. | Marks | | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 03 | 01 | -- | 04 | 02 | Max. | 80# | 20# | 100 | -- | -- | -- | 100 |
| | | | | | Min. | 32 | -- | 40 | -- | -- | -- | -- |

**# indicates online examination**

## 1.0 RATIONALE:

The study of mathematics is necessary to develop in the students the skills essential new for the disciplines like Genetic Engineering, Biotechnology and Information Technology etc. This course is extension of Basic Mathematics and stepping to learn applied mathematics. Engineering mathematics lays down the foundation to understand and express principles and laws involved in other technology courses.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Acquire knowledge of differential calculus, vector algebra, statistics and probability, complex numbers.
2. Develop the ability to apply mathematical methods to solve engineering problem
3. Acquire sufficient mathematical techniques necessary for daily and practical problems.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate mathematical definitions, principles and procedure to solve engineering and applied mathematical problems in

1. Function and limit of function
2. Derivative and its application
3. Vector and its application
4. Statistics probability
5. Complex number

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Function** | 1a. Solve problem of functions, State even & odd function, identify various types of function. | 1.1 Definition of function, types of functions, Basic functions such as algebraic, exponential, logarithmic, trigonometric, inverse trigonometric functions, explicit, implicit, composite, inverse, parametric, exponential even & odd functions, simple problems | 03 |
| **Unit-II**<br><br>**Limits** | 2a. Apply limit of various types of Functions. | 2.1 Definition of limit, limit of Functions such as algebraic Functions, trigonometric functions, logarithm and exponential functions | 05 |
| **Unit-III**<br><br>**Derivatives** | 3a. Solve problems of derivative with the help of rules & formulae of derivative. | 3.1 Concept and definition of derivative, Notation, standard Formulae and rules of derivative<br>3.2 Methods of differentiation, derivative of | 10 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | 3b. Differentiate various types of functions<br>3c. Calculate second order of derivative. | composite functions, implicit function. Parametric function. Inverse function. Logarithmic Differentiation.<br>3.3 Second order derivatives, simple problems. | |
| **Unit-IV**<br><br>**Application Of Derivatives** | 4a. Apply geometrical meaning of derivative; solve the problem based on related rates, radius of curvature & maxima minima. | 4.1 Geometric meaning of derivative<br>4.2 Error theorem.<br>4.3 Related rates, radius of curvature<br>4.4 Maxima & Minima | 06 |
| **Unit-V**<br><br>**Vectors** | 5a. Apply algebra of vector<br>5b. Calculate scalar and vector products<br>5c. Apply vector algebra to find work done and moment of force, Area of parallelogram | 5.1 Definition of vector, position vector, algebra of vector (equality, addition, subtraction and scalar multiplication)<br>5.2 Dot (scalar) and vector (cross) product of two vectors.<br>5.3 Application of vectors, work done and moment of force about a point and line. | 08 |
| **Unit-VI**<br><br>**Statistics & Probability** | 6a. Calculate range, mean deviation, standard deviation for group and ungrouped data, coefficient of variance<br>6b. Apply the theory of probability to solve problem<br>6c. Apply addition and multiplication theorems | 6.1 Measure of dispersion such as range, mean deviation, standard deviation, variation and coefficient of variation.<br>6.2 Definition of random experiment, sample space event, occurrence of events and types of events (impossible, mutually exclusive, exhaustive and equally likely)<br>6.3 Definition of probability, addition and multiplication theorems of probability. | 08 |
| **Unit-VII**<br><br>**Complex Number** | 7a. Solve problem based on complex number(real and imaginary part, polar form)<br>7b. Apply Algebra of complex number to solve problem<br>7c. Solve problem of Euler's function & circular function, Hyperbolic function. | 7.1 Definition of complex number, Cartesian, polar and exponential forms of complex number.<br>7.2 Algebra of complex no. (equality, addition, subtraction multiplication and division)<br>7.3 De–Moiver's theorem (without proof) and simple problems.<br>7.4 Euler's form of circular functions, Hyperbolic functions and relation between them. | 08 |
| **TOTAL** | | | **48** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

| Unit No. | Unit Title | Distribution of Marks | | | |
|---|---|---|---|---|---|
| | | R Level | U Level | A and above Levels | Total Marks |
| I | Function | 02 | 02 | -- | 04 |
| II | Limits | 02 | 04 | 02 | 08 |
| III | Derivative | 06 | 08 | 06 | 20 |
| IV | Application Of Derivative | 02 | 04 | 06 | 12 |
| V | Vector | 04 | 06 | 02 | 12 |
| VI | Statistics And Probability | 04 | 04 | 04 | 12 |

| Unit No. | Unit Title | Distribution of Marks | | | |
|---|---|---|---|---|---|
| | | R Level | U Level | A and above Levels | Total Marks |
| VII | Complex Number | 04 | 04 | 04 | 12 |
| | **TOTAL** | **24** | **32** | **24** | **80** |

## 6.0 ASSIGNMENTS/TUTORIAL/TASKS:

| Sr. No. | Unit No. | **Batch wise Tutorial Exercises** (Outcomes in Psychomotor Domain) **Tutorial:** Ten question of multiple choice with justification | Approx. Hrs. required |
|---|---|---|---|
| 1 | I | Function | 01 |
| 2 | II | Limits I | 01 |
| 3 | II | Limits II | 01 |
| 4 | III | Derivative I | 01 |
| 5 | III | Derivative II | 01 |
| 6 | III | Derivative III | 02 |
| 7 | III | Second Order Derivative | 01 |
| 8 | IV | Application Of Derivative | 02 |
| 9 | V | Vector | 02 |
| 10 | VI | Statistics | 01 |
| 11 | VI | Probability | 01 |
| 12 | VII | Complex Number | 02 |
| | | **TOTAL** | **16** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Teacher guided self learning activities.
2. Applications to solve identified Engineering problems and use of Internet.
3. Learn graphical software: Excel, DPlot, Graph.

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any)::

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Mathematics for polytechnic student (II) | S. P. Deshpande | Pune Vidyarthi Gruha |
| 2 | Higher Engineering Mathematics | B. S. Grewal | Khanna |
| 3 | Advanced Engineering Mathematics | H.K. Das | Khanna Publication |
| 4 | Calculus of single variable | R.T. Smith | Tata McGraw Hill. |
| 5 | Engineering Mathematics | S.S. Shastrii | Prentice Hall Publication |

### B) Software/Learning Websites

1. http://schools.aglasem.com/1341
2. http://www.emathzone.com/tutorials/calculus/types-of-functions.html
3. http://www.mathsisfun.com/algebra/vectors.html
4. http://www.mathsisfun.com/data/
5. http://mathworld.wolfram.com/ComplexNumber.html

### C) Major Equipment/ Instrument with Broad Specifications

1. Scientific Calculator
2. Computer system with Printer and Internet system.
3. LCD Projector.

**10.0 MAPPING MATRIX OF PO'S AND CO'S::**

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **a** | **b** | **c** | **d** | **e** | **f** | **g** | **h** | **i** | **j** | **k** |
| CO1 | H | | M | | | | | | | | L |
| CO2 | H | | M | | | | | | | | L |
| CO3 | H | | M | | | | | | | | L |
| CO4 | H | | M | | | | | | | | L |
| CO5 | H | | M | | | | | | | | L |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME :** Diploma Programme in CE / ME / PS / EE / IF / CM / EL / AE
**COURSE :** Applied Physics (PHY) **COURSE CODE :** 6105

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | Online Exam Hrs. | Marks | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 04 | -- | 02 | 06 | 02 | Max. | 80# | 20# | 100 | -- | -- | 50 | 150 |
| | | | | | Min. | 32 | -- | 40 | -- | -- | 20 | -- |

**# Indicates online examination**

## 1.0 RATIONALE:

Physics is associated with our lives at every stage. A good scientific attitude is essential for every human being to increase his/her quality of life. Today learning Physics has become more challenging because it is no more a watertight compartment. The approach is now inter-disciplinary and integrated with emphasis on the principle with their application.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Understand and apply the laws of Physics in various contexts.
2. Apply their knowledge of basic physics to solve problems and present the solution in a clear and concise manner.
3. Acquire and develop experimental skills including the use of variety of laboratory instruments, taking of data for interpretation and its analysis.
4. Develop skill in the presentation of clear and concise written accounts of laboratory work.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Differentiate between various systems of measurement and identify proper unit of a physical quantity.
2. Identify the properties of Laser and Optical fibre as well as their engineering applications.
3. Acquire the knowledge about superconductors, indoor lighting.
4. Identify conductors & insulators of heat and analyse the relation between pressure, volume and temperature of gas.
5. Recognise elastic properties of materials and types of modulus of elasticity.
6. Identify the properties such as surface tension of liquids and viscosity of fluids.
7. Be aware of the propagation of sound and acoustics of building.
8. Distinguish between various effects produced by an electric charge.
9. Gain broad ideas about capacitors, semiconductors and p-n junction diode.
10. Discover the basics and applications of photoelectric cell and X rays.

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Units & Measurements** | 1a. Differentiate between fundamental &derived quantities/units. | 1.1 Need of measurements, units of measurements, systems of units, SI units, fundamental & derived units, fundamental & derived quantities. | 08 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | 1b. Determine dimension of a physical quantity.<br>1c. Calculate different types of errors in measurements.<br>1d. Illustrate use of vernier caliper and screw gauge for linear measurements. | 1.2 Dimension of physical quantity, dimensional analysis & its uses, order of magnitude & significant figures.<br>1.3 Accuracy & errors, instrumental, systematic and random error, estimation of error-average value, absolute error, relative error & percentage error, numerical.<br>1.4 Measuring instruments-vernier caliper and micrometer screw gauge. | |
| **Unit-II**<br><br>**Light** | 2.a. Calculate refractive index of material of prism.<br>2.b. Identify advantages of optical fibre over conducting wire.<br>2.c. Differentiate between types of optical fibre.<br>2.d. Recognise the principle of photometry.<br>2.e. Acquire knowledge about indoor lighting. | 2.1 Refraction of light, refractive index and its significance, Refraction through prism, Derivation of Prism formula.<br>2.2 Total internal reflection of light (TIR), Optical fibre, advantages and disadvantages, construction of optical fibre.<br>2.3 Transmission characteristics of Optical, fibre, types of optical fibre-step & graded index fibre, Application of optical fibre.<br>2.4 Luminous flux, luminous intensity, illumination, candela, lumen, illuminance, inverse square law of illuminance, principle of photometry.<br>2.5 Indoor lighting-direct, indirect, semi-indirect, utilization factor, efficiency of source, maintenance factor, space to height ratio, total luminous flux, numerical. | 08 |
| **Unit-III**<br><br>**Laser** | 3a. Describe the principle of laser.<br>3b. Acquire knowledge about He-Ne laser<br>3c. Identify applications of holography | 3.1 Laser, Properties of laser, spontaneous absorption, spontaneous emission and stimulated emission, population inversion, pumping, life time, meta-stable-state.<br>3.2 Construction, advantages & disadvantages of Helium-Neon Laser, applications of Laser.<br>3.3 Holography recording and Reconstruction of hologram, Application of holography. | 06 |
| **Unit-IV**<br><br>**Current Electricity** | 4a. Demonstrate ohm's law, use of metre bridge to find resistance.<br>4b. Use potentiometer to find internal resistance.<br>4c. Identify positive/ Negative temperature | 4.1 Ohm's law, Specific resistance, conductance, conductivity, Wheatstone's network, balancing condition, meter bridge.<br>4.2 Theory of shunt, fall of potential along wire, potentiometer.<br>4.3 Effect of temperature on resistance of metals, semiconductors & insulators, temperature coefficient of | 08 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | coefficient of resistance of material.<br>4d. Calculate electrical energy consumed in kWh.<br>4e. Distinguish between properties of conductor & superconductor. | resistance, positive& negative temperature coefficient of resistance.<br>4.4 Heating effect of electric current, electric power, electric energy, kilowatt hour.<br>4.5 Superconductivity, graph of temperature versus resistivity for mercury, superconductors, properties and application of superconductors, Numerical. | |
| **Unit-V**<br><br>**Transfer of Heat & Gas laws** | 5a. Illustrate conversion of temperature.<br>5b. Distinguish between good & bad conductors of heat on the basis of thermal conductivity.<br>5c. Calculate coefficients of expansion of solids.<br>5d. Identify the relation between pressure, volume & temperature of gas.<br>5e. Gain idea about specific heats of gases.<br>5f. Distinguish between isothermal, adiabatic, isobaric & isochoric process. | 5.1 Temperature & heat, Celsius & Fahrenheit scale, conduction, convection, radiation.<br>5.2 Conduction of heat –variable state, steady state and temperature gradient, law of thermal conductivity, coefficient of thermal conductivity, applications of thermal conductivity.<br>5.3 Expansion of solids, Coefficient of linear, areal and cubical expansion and relation between them.<br>5.4 Statement of Boyle's law, Charle's law, Gay Lussac's law, concept of absolute zero, Kelvin scale of temperature.<br>5.5 General gas equation, universal gas constant, Work done in expanding a gas at constant pressure, specific heats of a gases and relation between them (equation only).<br>5.6 Isothermal, isobaric and isochoric and adiabatic process, difference between these processes, numerical. | 08 |
| **Unit-VI**<br><br>**(ONLY For CE / ME / PS / AE)**<br><br>**Elasticity** | 6a. Differentiate between elasticity, plasticity & rigidity<br>6b. Calculate moduli of elasticity of materials.<br>6c. Illustrate applications of elasticity. | 6.1 Deforming force, restoring force, elasticity, plasticity and rigidity.<br>6.2 Stress and strain with their types, elastic limit, Hooke's law, moduli of elasticity (Y, η, K) and their significance, Poisson's ratio.<br>6.3 Stress-strain diagram for wire under increasing load, factor of safety, applications of elasticity, Numericals. | 06 |
| **Unit-VII**<br><br>**(ONLY For CE / ME / PS / AE)**<br><br>**Surface Tension** | 7a. Acquire knowledge about surface tension of liquids & its effects.<br>7b. Recognise effects of impurities & temperature on surface tension of liquid.<br>7c. Calculate surface tension of liquid. | 7.1 Cohesive and adhesive force, range of molecular forces surface, sphere of influence, surface energy, Surface tension, molecular theory of surface tension.<br>7.2 Effect impurities and temperature on surface tension, relation between surface tension & surface energy<br>7.3 Angle of contact, capillary action relation between surface tension, | 06 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | | capillary rise, radius of capillary, application of surface tension, numericals. | |
| **Unit-VIII**<br><br>**(ONLY For CE / ME / PS / AE)**<br><br>**Viscosity** | 8a. Identify applications of Pascal's law.<br>8b. Gain knowledge about viscosity of fluids.<br>8c. Find viscosity of fluids using Stokes law<br>8d. Distinguish between types of flow of fluid.<br>8e. Identify significance of Reynolds number. | 8.1 Pressure, pressure due to liquid column, hydrostatic paradox, Pascal's law and its applications.<br>8.2 Viscosity, velocity gradient, Newton's law of viscosity, coefficient of viscosity and its unit.<br>8.3 Stoke's law, expression for relation between coefficient of viscosity and terminal velocity.<br>8.4 Types of flow, Streamline and turbulent flow, advantages of streamline flow.<br>8.5 Critical velocity, Reynolds's number and its significance, Bernoulli's principle & its applications, application of viscosity, Numericals. | 06 |
| **Unit-IX**<br><br>**(ONLY For CE / ME / PS / AE)**<br><br>**Sound and acoustic** | 9a. Recognise frequency of audible & other sound waves.<br>9b. Calculate sound intensity in decibel scale.<br>9c. Illustrate properties & applications of Ultrasonic waves.<br>9d. Calculate reverberation time using Sabine formula.<br>9e. Plan acoustical planning of a hall. | 9.1 Introduction to sound, frequency of sound and limits of Audibility, intensity of sound.<br>9.2 Reflection of sound, absorption coefficient, transmission coefficient, reflection coefficient, Loudness and intensity level, threshold of hearing & pain, Decibel scale.<br>9.3 Ultrasonic waves-properties & applications.<br>9.4 Echo, Reverberation, standard reverberation time, Sabine's formula.<br>9.5 Condition for good Acoustics, factors affecting acoustical planning of auditorium. Numericals. | 08 |
| **Unit-VI**<br><br>**(only for EE / IF / CM / EL)**<br><br>**Electrostatics** | 6a. Calculate force between two charges using Coulomb's law.<br>6b. Illustrate different properties of electric lines of force.<br>6c. Calculate electric potential due an electric charge.<br>6d. Identify importance of potential of earth. | 6.1 Coulomb's inverse square law, permittivity of medium, unit charge, electric field, electric field intensity.<br>6.2 Electric lines of force and their properties, electric flux, Electric flux density and relation between them, Electric flux associated with charge.<br>6.3 Electric potential, potential difference, potential gradient, dielectric strength, breakdown potential, expression for PD between two points due to point charge, expression for absolute potential at point.<br>6.4 Potential due to charged sphere. (three cases), potential of earth, numerical. | 08 |
| **Unit-VII** | 7a. Illustrate charging | 7.1 Capacitor, Capacitance and its unit, | 06 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **(only for EE / IF / CM / EL)**<br><br>**Capacitance** | &discharging of capacitor.<br>7b. Calculate effective capacitance of combination of capacitors.<br>7c. Identify types of capacitors.<br>7d. Calculate energy stored by a capacitor. | dielectric, effect of dielectric, dielectric constant, dielectric breakdown, Principle of capacitor.<br>7.2 Charging and discharging of Capacitor, Capacitor in series and parallel.<br>7.3 Types of capacitor- fixed & variable.<br>7.4 Expression for capacitance of parallel plate capacitor, capacitance of spherical and cylindrical capacitor equation only, energy stored by charged capacitor (equation only), numerical. | |
| **Unit-VIII**<br><br>**(only for EE / IF / CM / EL)**<br><br>**Photo electricity and X-rays** | 8a. Acquire knowledge about photoelectric effect.<br>8b. Identify characteristics of Photoelectric effect.<br>8c. Calculate KE of photoelectrons using Einstein's equation.<br>8d. Recognise production of x-rays.<br>8e. Illustrate properties & applications of x- rays. | 8.1 Planck's quantum theory, Photo electric effect, experiment to study photoelectric effect.<br>8.2 Characteristics of photoelectric effect, threshold frequency, threshold-wavelength, photoelectric work function, stopping potential.<br>8.3 Einstein's photoelectric equation, photoelectric Cell and types, applications of photoelectric cell.<br>8.4 Origin of x-rays, production of X-rays using Coolidge's x-ray tube, minimum wavelength of X-ray.<br>8.5 Properties of X-rays, applications of x- rays, numerical. | 06 |
| **Unit-IX**<br><br>**(only for EE / IF / CM / EL)**<br><br>**Band Theory of Solids** | 9a. Classify solids on the basis of band theory.<br>9b. Classify Semiconductors.<br>9c. Illustrate forward & reverse bias of P-N Junction diode. | 9.1 Energy bands in solids-valence band, conduction band and forbidden energy gap, classification of solids on the basis of band theory : conductor, insulator and semiconductor.<br>9.2 Properties of semiconductor, classification of semiconductors intrinsic & extrinsic, P type & N type semiconductors.<br>9.3 P-N junction diode, forward & reverse bias characteristics of P-N junction diode, advantages of semiconductor devices. | 06 |
| | | **TOTAL** | **64** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

| Unit No. | Unit Title | Distribution of Theory Marks | | | |
|---|---|---|---|---|---|
| | | R Level | U Level | A and above Levels | Total Marks |
| **Units common for all programmes** | | | | | |
| I | Units and measurements | 04 | 02 | 04 | 10 |
| II | Light | 02 | 04 | 04 | 10 |
| III | Laser | 02 | 04 | 02 | 08 |
| IV | Current electricity | 02 | 04 | 04 | 10 |
| V | Transfer of heat & gas laws | 02 | 04 | 04 | 10 |
| **Units ONLY FOR CE/ME/PS/AE** | | | | | |
| VI | Elasticity | 02 | 04 | 02 | 08 |
| VII | Surface tension | 02 | 04 | 02 | 08 |
| VII | Viscosity | 02 | 02 | 04 | 08 |
| IX | Sound and Acoustics | 02 | 02 | 04 | 08 |
| **Units ONLY FOR EE/IF/CM/EL** | | | | | |
| VI | Electrostatics | 02 | 04 | 02 | 08 |
| VII | Capacitance | 02 | 04 | 02 | 08 |
| VIII | Photo electricity & X-rays | 02 | 02 | 04 | 08 |
| IX | Band theory of solids | 02 | 02 | 04 | 08 |
| | **TOTAL** | **20** | **30** | **30** | **80** |

**Legends:** R = Remembrance (Knowledge); U= Understanding; A= Application and above levels (Revised Bloom's taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

***Note****: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of* ***Programme Outcomes/Course Outcomes in affective domain*** *as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

| Sr. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. Required |
|---|---|---|---|
| | | **Common practicals** | |
| 1 | I | Measure the dimensions of different objects using Vernier caliper | 02 |
| 2 | I | Measure the dimensions of different objects using micrometer screw gauge | 02 |
| 3 | II | Determine the refractive index of material of prism using spectrometer | 02 |
| 4 | IV | Verify ohm's law and determine resistivity of material of given wire. | 02 |
| 5 | IV | Verify law of resistance in series & parallel using meter bridge. | 02 |
| 6 | V | Determine coefficient of linear expansion using Pullinger's apparatus. | 02 |
| 7 | V | Verify Boyle's law | 04 |
| 8 | IV | Verify principle of potentiometer. | 02 |
| | | **Practicals for CE/ME/PS/AE** | 0 |

| Sr. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. Required |
|---|---|---|---|
| 1 | VI | Verify Hooke's law of elasticity and determine Young's modulus of material of wire using Searle's apparatus. | 04 |
| 2 | VII | Determine surface tension of water using capillary rise method. | 02 |
| 3 | VIII | Verify Stoke's law of viscosity and determine coefficient of viscosity of given fluid. | 04 |
| 4 | IX | Determine coefficient of absorption of sound of given acoustical material. | 04 |
| | | **Practicals for EE/IF/CM/EL** | |
| 1 | VII | Verify law of capacitance in series/parallel. | 02 |
| 2 | VII | Charging & discharging of capacitor and determine its time constant. | 04 |
| 3 | VIII | To study I-V characteristic of photoelectric cell. | 04 |
| 4 | IX | To study I-V characteristics of PN junction diode in forward/reverse biased condition. | 04 |
| | | **TOTAL** | **32** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Prepare charts of Vernier caliper, screw gauge, travelling microscope, spherometer & spectrometer for lab demonstration.
2. Study acoustical planning of institute's auditorium hall.
3. Study lighting system of institute's conference hall.

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Show videos based on topics in the curriculum (total internal reflection, population inversion, different laws of physics) for better understanding of the concepts.
2. Show videos of practical demonstration before performance of practical for better understanding of practical.

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Engineering Physics | R K Gaur & S L Gupta | Dhanpat Rai Pub. |
| 2 | Applied Physics | Prof. Arthur Beiser | Tata McGraw hill Pub. |
| 3 | Engineering Physics | D K Bhattacharya | Oxford University press |
| 4 | Physics | Halliday & Resnick | Wiley India |

### B) Software/Learning Websites

1. www.physicsclassroom.com
2. www.physics.org
3. www.physics.brown.edu
4. http://scienceworld.wolfram.com/physics/
5. http://hyperphysics.phy-astr.gsu.edu/hbase
6. www.msu.edu/~brechtjo/physics
7. http://www.rp-photonics.com/laser_applications.html
8. http://webphysics.davidson.edu/alumni/jimn/He-Ne/Pages/Theory.htm
9. http://physix_jun.tripod.com/fibres_4.htm
10. http://www.suite101.com/content/optics-total-internal-reflection-a51310
11. http://teachers.web.cern.Ch/teachers/archive/HST2001/accelerators/superconductivity/superconductivity.htm
12. http://en.wikipedia.org/wiki/Acoustics

**C) Major Equipment/ Instrument with Broad Specifications**

1. Vernier Caliper (LC = 0.02mm)
2. Micrometer screw gauge ( LC = 0.01mm)
3. Aneroid barometer
4. Digital stop watch
5. Travelling Microscope
6. Regulated power supply
7. Apparatus to verify Boyles law
8. Stoke's App to measure viscosity
9. Meter bridge
10. Searle's apparatus for Young's modulus
11. Pullinger's apparatus
12. Gas burner with regulator, LPG gas cylinder and lighter
13. Spectrometer
14. Bunsen's photometer.
15. Ammeter, voltmeter, galvanometer, rheostat, resistance box
16. Potentiometer.

## 10.0 MAPPING MATRIX OF PO'S AND CO'S:

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **a** | **b** | **c** | **d** | **e** | **f** | **g** | **h** | **i** | **j** | **k** |
| CO1 | H | | M | M | L | | | H | L | | L |
| CO2 | H | | M | L | L | | | M | L | | |
| CO3 | H | | M | L | L | | | M | | | |
| CO4 | H | M | M | L | M | L | | M | | | L |
| CO5 | H | M | M | L | M | | | M | | | |
| CO6 | H | M | L | L | M | | | M | | | |
| CO7 | H | | L | L | M | L | | M | L | | L |
| CO8 | H | | M | L | M | | | L | L | | |
| CO9 | H | | M | L | M | | | M | L | | |
| CO10 | H | | L | L | M | L | | L | L | | L |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME** : Diploma Programme in CE / ME / PS / EE / IF / CM / EL / AE
**COURSE** : Applied Chemistry (CHY) **COURSE CODE** : 6106

**TEACHING & EXAMINATION SCHEME**

| Teaching Scheme | | | | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | Online Exam. Hrs. | Marks | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 04 | - | 02 | 06 | 02 | Max. | 80# | 20# | 100 | -- | -- | 50 | 150 |
| | | | | | Min. | 32 | -- | 40 | -- | -- | 20 | -- |

**# indicates online examination**

## 1.0 RATIONALE:

Chemistry is the basic science course which is essential to all engineering programmes. The basic aim of teaching science is to develop in the students the habit of scientific inquiry, ability to establish the cause and effect. The study of basic concepts of chemistry like atomic structure, water treatment, metals and alloys, corrosion, lubricants, non metallic materials, fuels, environmental effects etc. will help the students to understand engineering courses where the emphasis is laid on the application of these concepts. Teaching of chemistry should be aimed at developing the right type of aptitude in the students and the ability to predict the result under given conditions.

Thus good foundation in basic science will help the students in their self development to cope up with continuous flow of innovation.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Develop scientific attitude in students.
2. Apply knowledge of chemistry in engineering situations.
3. Develop in students the habit of scientific enquiry, ability to establish cause and effect.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Apply the principles of chemistry to engineering situations.
2. Apply knowledge to correlate the properties of materials, their engineering uses and protection.
3. Write electronic configuration of various elements.
4. Apply various applications of electrolysis in engineering situations.
5. Illustrate various methods of softening of hard water.
6. Use the appropriate metals and alloys for different engineering applications.
7. Differentiate various types of corrosion and gain knowledge on control measures associated with corrosion
8. Select lubricants for machines.
9. Enlist the various characteristics of good fuel.

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics & subtopics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Atomic Structure** | 1a. Describe structure of an atom<br>1b. Explain Bohr's theory and distinguish between orbit and orbital | 1.1 Structure of an atom, fundamental particles of an atom, concept of atomic number, mass number.<br>1.2 Bohr's theory, orbit, orbital, shapes of orbital, energy level, sub energy level | 06 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics & subtopics | Hours |
|---|---|---|---|
| | 1c. Describe rules for arrangement of electrons<br>1d. Give electronic configuration<br>1e. Describe the different types of compounds<br>1f. Explain the formation of various electrovalent and covalent compounds | 1.3 Hund's rule, Aufbau principle, Rules for distribution of electrons in shell and sub shells.<br>1.4 Electronic configuration of atoms having atomic number 1-30<br>1.5 Electrovalent and covalent compounds, electrovalency and covalency<br>1.6 Formation of covalent compound e.g. $H_2O$, $CH_4$, $O_2$, $N_2$, $C_2H_2$<br>1.7 Formation of electrovalent compound e.g. NaCl, $CaCl_2$, $AlCl_3$ | |
| **Unit-II**<br><br>**Electro chemistry** | 2a. Explain basic concepts of electrochemistry.<br>2b. Explain theory of ionization and factors affecting it<br>2c. Explain mechanism of electrolysis with examples.<br>2d. Describe faraday's first and second laws and solve numerical.<br>2e. Explain the applications of electrolysis<br>2f. Describe the construction and working of cells | 2.1 Definition of electrochemistry, atom, ion, electrode, cell, electrolysis, electrolytes, non-electrolytes, anode, cathode etc.<br>2.2 Arrhenius theory of ionization, degree of ionization, factors affecting degree of ionization.<br>2.3 Electrolysis, mechanism, electrolysis of fused NaCl, aqueous NaCl using platinum electrode, $CuSO_4$ solution using Copper<br>2.4 Faraday's first and second law,<br>2.5 Numericals on Faraday's laws.<br>2.6 Process of electroplating and electro refining<br>2.7 Types of cell- e.g. Dry cell, Ni-Cd cell, introduction to solar cell | 08 |
| **Unit-III**<br><br>**Water** | 3a. Explain sources, impurities, properties of water.<br>3b. Differentiate between hard and soft water<br>3c. Describe the ill effect of hard water in domestic and industrial field<br>3d. Explain the different methods for removal of hardness of water.<br>3e. Describe the different treatments of drinking water<br>3f. Explain the concept of pH and pOH numerical related with it, applications of pH in engineering. | 3.1 Sources of water- Rain, surface, underground water. Impurities in water- suspended, colloidal, dissolved, biological<br>3.2 Physical and chemical properties of water.<br>3.3 Hard and soft water. Types of hardness of water, Salts producing hardness of water, Units of hardness of water.<br>3.4 Domestic field- cooking, washing, bathing, drinking. Industrial field- paper, textile, dye, sugar industry.<br>3.5 Temporary hardness- boiling, Clark's method.<br>3.6 Permanent hardness- Permutit's method, ion exchange method.<br>3.7 Methods of purification of water: Screening, Sedimentation, coagulation, | 10 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics & subtopics | Hours |
|---|---|---|---|
| | | filtration, Sterilization of water.<br>3.8 Definition of pH and pOH, pH scale and numerical.<br>3.9 Applications of pH in engineering. -city water supply, corrosion, effluent treatment, electroplating. | |
| **Unit-IV**<br><br>**Metals** | 4a. Explain the basic concepts of metallurgy.<br>4b. Describe different characteristics of metal.<br>4c. Explain the metallurgy of iron.<br>4d. Describe the physical properties and applications of metals. | 4.1 Definition of ore, mineral, gangue<br>4.2 Hardness, toughness, brittleness, tensile strength, malleability, ductility, machinability, weldability<br>4.3 Flow sheet of metallurgy<br>4.4 Steps of metallurgy :<br>a. Concentration: physical, chemical.<br>b. Reduction: smelting, alumino thermic process.<br>c. Refining: poling, liquation, distillation, electrorefining.<br>4.5 Physical properties and applications of Fe, Cu, Al, Cr, Ni, Sn, P | 08 |
| **Unit-V**<br><br>**Alloys** | 5a. Describe the meaning of alloy, its preparation and its purposes of formation.<br>5b. Explain the classification of alloys and their applications | 5.1 Definition of alloy, different methods of preparation of alloy,<br>5.2 Purposes of formation of an alloy.<br>5.3 Classification of alloys<br>• Ferrous alloy- alloys steel and its applications.<br>• Non ferrous alloy-Copper alloy-brass, bronze, gun metal, Monel metal Aluminum alloy-Duralumin<br>• Solder alloy and its types. | 06 |
| **Unit-VI**<br><br>**Corrosion** | 6a. Describe magnitude of corrosion, meaning of corrosion, types of corrosion<br>6b. Explain the factors affecting the atmospheric and immersed corrosion<br>6c. Explain different methods of protection of metal from corrosion | 6.1 Magnitude of corrosion, definition of corrosion, types of corrosion-<br>a) Atmospheric corrosion- definition, types –<br>b) corrosion due to oxygen, mechanism of corrosion due to oxygen, nature of film and its role in corrosion process<br>c) Corrosion due to other gases<br>6.2 Immersed corrosion- definition, it's mechanism, galvanic and concentration cell corrosion<br>6.3 Factors affecting atmospheric and immersed corrosion<br>6.4 Methods of protection of metal from corrosion- hot dipping, metal spraying, sherardizing, electroplating of metal cladding, organic coating-paints and varnish | 10 |
| **Unit-VII** | 7a. Describe lubricants, its function and | 7.1 Definition of lubricant, function of lubricants, classification of lubricants. | 08 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics & subtopics | Hours |
|---|---|---|---|
| **Lubricants** | classification of lubricants.<br>7b. Explain lubrication and it's types<br>7c. Describe physical and chemical properties of lubricants<br>7d. Explain selection of lubricants for various machines | 7.2 Definition of lubrication, types of lubrication<br>7.3 Physical properties- viscosity, viscosity index, oiliness, flash and fire point, volatility, cloud and pour point.<br>7.4 Chemical properties- acid value, saponification value, emulsification.<br>7.5 Properties and names of lubricants used for various machines like delicate instruments, heavy load and low speed machine, gears, cutting tools, I.C. Engine, steam engine | |
| **Unit-VIII**<br><br>**Fuels** | 8a. Describe fuels, characteristics of good fuel, types of fuel<br>8b. Describe solid fuel-e.g. coal in detail<br>8c. Describe liquid fuel e.g. -petroleum<br>8d. Describe gaseous fuel their advantages<br>8e. Distinguish between solid liquid and gaseous fuels | 8.1 Definition of fuel, characteristics of good fuel, classification of fuel<br>8.2 Solid fuel-e.g. coal, it's types, properties of good coal, selection of coal, analysis of coal, determination of C and H in coal<br>8.3 Liquid fuel-e.g. petrol, classification of petrol, refining of petrol<br>8.4 Gaseous fuel e.g. LPG, natural gas, biogas<br>8.5 Advantages of gaseous fuel over solid and liquid fuels<br>8.6 Comparison between solid, liquid and gaseous fuels | 08 |
| | | **TOTAL** | **64** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

| Unit No | Unit title | Distribution of Theory marks | | | |
|---|---|---|---|---|---|
| | | **R level** | **U level** | **A level** | **Total** |
| 1 | Atomic Structure | 04 | 02 | 02 | 08 |
| 2 | Electrochemistry | 04 | 04 | 04 | 12 |
| 3 | Water | 04 | 04 | 04 | 12 |
| 4 | Metals | 04 | 02 | 04 | 10 |
| 5 | Alloys | 02 | 02 | 02 | 06 |
| 6 | Corrosion | 04 | 02 | 06 | 12 |
| 7 | Lubricants | 04 | 02 | 04 | 10 |
| 8 | Fuels | 04 | 02 | 04 | 10 |
| | **TOTAL** | **30** | **20** | **30** | **80** |

**Legends:** R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignment/task should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the desired programme outcome/course outcome.

***Note**: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in the mapping matrix for this course. Faculty should ensure that students also acquire Programme Outcomes/Course Outcomes related to affective domain.*

| Sr. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. required |
|---|---|---|---|
| 1 to 5 | I | Inorganic qualitative analysis of any five solutions | 10 |
| 6 | II | Determination of electrochemical equivalent of copper. | 02 |
| 7 to 8 | III | Strength of given acidic solution using standard base solution. | 04 |
| 9 | III | Determination of pH of different unknown solutions. | 02 |
| 10 | III | Determination of chloride content in given water sample. | 02 |
| 11 to 12 | III | Determination of hardness of water | 04 |
| 13 | V | Determination of % of Fe in given ferrous alloy sample. | 02 |
| 14 | VI | To find relation between decrease in weight due to corrosion of metal and time. | 02 |
| 15 | VII | Determination of viscosity of given lubricating oil. | 02 |
| 16 | VIII | Determination of % of moisture in given coal sample by proximate analysis. | 02 |
| | | **TOTAL** | **32** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Draw structures and write electronic configurations of atoms having atomic number 1-30.
2. Testing of water samples.
3. Sampling and collection of coal.

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. CAI package, video demonstration, charts, models, visits and expert seminar/lecture.

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Books | Author | Publication |
|---|---|---|---|
| 1 | Engineering Chemistry | Jain & Jain | Dhanpat Rai and Sons |
| 2 | A Text Book of Polytechnic Chemistry | V. P. Mehta | Jain Brothers |
| 3 | Engineering Chemistry | S. S. Dara | S. Chand Publication |
| 4 | Industrial Chemistry | B. K. Sharma | Goel Publication |
| 5 | Environmental Chemistry & Pollution control | S. S. Dara | S. Chand Publication |
| 6 | Engineering Chemistry | M. M. Uppal | Khanna Publisher New Delhi |

### B) Software/Learning Websites

1. http://chemistry.osu.edu/~woodward/ch121/ch2_atoms.htm
2. http://www.nyu.edu/pages/mathmol/textbook/atoms.html
3. www.chemguide.co.uk/atoms/properties/gcse.html
4. http://www.water-research.net/index.php/water-treatment/tools/hard-water-hardness
5. http://www.unitedutilities.com/documents/WaterhardnessFactSheet.pdf
6. http://www.explainthatstuff.com/alloys.html
7. http://www.gordonengland.co.uk/xcorrosion.htm
8. http://cuiet.info/notes/chemistry/Lubricants.pdf
9. http://www.ignou.ac.in/upload/unit-3.pdf

**C) Major Equipment/ Instrument with Broad Specifications**

1. Muffle furnace
2. Distillation Plant
3. Computer lab with 20 Computers for online theory exam.
4. Digital pH meter
5. Ostwald's viscometer
6. Electronic weighing balance (0 to 100gm capacity).
7. Digital Stop watch.
8. Lovibond comparator
9. Regulated DC power supply
10. Rheostat
11. Ammeter

**10.0 MAPPING MATRIX OF PO'S AND CO'S:**

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **a** | **b** | **c** | **d** | **e** | **f** | **g** | **h** | **i** | **j** | **k** |
| CO1 | H | M | M | | L | | | L | | | L |
| CO2 | H | | M | M | L | | | | | | L |
| CO3 | H | | | M | | | | | | | L |
| CO4 | H | | | M | | | | | | | L |
| CO5 | H | M | L | | M | | | L | | | |
| CO6 | H | M | | M | M | | | | | | L |
| CO7 | H | | | M | M | | | | | | L |
| CO8 | H | | | M | M | | | | | | L |
| CO9 | H | | | | | | | | | | L |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME** : Diploma Programme in CE / ME / EE / IF / CM / EL / AE
**COURSE** : Engineering Graphics (EGR) **COURSE CODE** : 6107

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 02 | -- | 04 | 06 | -- | Max. | -- | -- | -- | 25 | -- | 25 | 50 |
| | | | | | Min. | -- | -- | -- | 10 | -- | 10 | -- |

## 1.0 RATIONALE:

Engineering Graphics is the language of engineers. The concepts of Engineering Graphics are used to develop & express the ideas and convey the instructions, which are used to carry out jobs in the Engineering field. This preliminary course aims at building a foundation for the further course in drawing and other allied courses.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Understand the use of drawing tools and equipments.
2. Understand the significance of engineering curves for various applications.
3. Understand the projections of point and line inclined to one reference plane.
4. Interpret the pictorial view and understand orthographic projection of the simple object.
5. Interpret the orthographic projection and understand pictorial view of the simple object.
6. Understand the significance of sectional view in the drawing.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Draw the engineering curves for given engineering applications.
2. Draw the projections of point and lines inclined to one reference plane only.
3. Draw and dimension orthographic projections of given object.
4. Interpret orthographic projections of object and draw isometric view.
5. Draw sectional view of simple objects as per IS convention.

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Drawing instruments and their uses** | 1a. Use Instruments for drawing, Scales, Lines, & their applications. | 1.1 Letters and numbers (single stroke vertical)<br>1.2 Convention of lines and their applications.<br>1.3 I.S. codes for planning and layout.<br>1.4 Scale (reduced, enlarged & full size) plain scale and diagonal scale.<br>1.5 Sheet layout.<br>1.6 Geometrical constructions and drawing polygons | 04 |
| **Unit-II**<br><br>**Engineering curves** | 2a. Draw Conic curves, involutes, Cycloid.<br>2b. State the applications of engineering curves. | 2.1 Methods for drawing an ellipse concentric circle, directrix focus and arc of circle method.<br>2.2 Methods for drawing parabola by directrix focus and rectangular method. | 08 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | | 2.3 Methods for drawing a hyperbola by directrix focus and rectangular method.<br>2.4 Procedure for drawing involutes of circle and polygon (up to hexagon)<br>2.5 Procedure for drawing cycloid, epicycloid and hypocycloid | |
| **Unit-III**<br><br>**Projections of Point and Line** | 3a. Draw the projection of point<br>3b. Draw projection of line | 3.1 Projection of point in the different quadrants.<br>3.2 Projection of line parallel to one plane and inclined to another reference plane only. | 04 |
| **Unit-IV**<br><br>**Orthographic Projections** | 4a. Interpret & draw orthographic views from given pictorial view. | 4.1 Concept of Orthographic projections.<br>4.2 Conversion of pictorial view into Orthographic views only first angle projection method for simple objects. | 06 |
| **Unit-V**<br><br>**Isometric Projections** | 5a. Interpretation of isometric view.<br>5b. Draw isometric view from given orthographic views | 5.1 Use of Isometric scale.<br>5.2 Comparison of true scale with isometric scale<br>5.3 Conversion of orthographic views into isometric View / projection | 06 |
| **Unit-VI**<br><br>**Sectional View** | 6a. Draw sectional view of simple drawing | 6.1 Representation of sectional plane<br>6.2 Conversion of orthographic views into sectional View | 04 |
| | | **TOTAL** | **32** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Not Applicable

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignment/task should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the desired programme outcome/course outcome.

***Note**: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in the mapping matrix for this course. Faculty should ensure that students also acquire Programme Outcomes/Course Outcomes related to affective domain.*

| Sr. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. required |
|---|---|---|---|
| 1 | I | Two sheet on letters, numbers and representation of lines and redraw the figures. | 08 |
| 2 | II | Sheet on six engineering curves | 12 |
| 3 | III | Sheet on projections of line. ( 04 problems) | 12 |
| 4 | IV | Sheet on orthographic projection.( 02 problems) | 12 |
| 5 | V | Sheet on isometric views and projection. ( 04 problems) | 12 |
| 6 | VI | Sheet on sectional view. ( 02 problems) | 08 |

| Sr. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. required |
|---|---|---|---|
| | | **TOTAL** | **64** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Collect the information about application of engineering curves.
2. Sketch the orthographic views of simple engineering product in sketch book.
3. Sketch isometric view of simple engineering product in sketch book.
4. Sketch sectional view of simple engineering product in sketch book.

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Show Three Dimensional models of different objects.
2. Use software's, CAI packages for better imagination.

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Engineering Drawing | N. D. Bhatt | Charotar Publishing House |
| 2 | Engineering Drawing | P. J. Shaha | S. Chand |
| 3 | Engineering Drawing and Graphics | K. Venugopal | New Age International |

### B) Software/Learning Websites

1. AutoCAD
2. Solid works.

### C) Major Equipment/ Instrument with Broad Specifications

Not applicable

## 10.0 MAPPING MATRIX OF PO'S AND CO'S:

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **a** | **b** | **c** | **d** | **e** | **f** | **g** | **h** | **i** | **j** | **k** |
| CO1 | H | H | H | | | | | | | | L |
| CO2 | H | H | | | | | | | | | |
| CO3 | H | M | M | M | | | | | L | | L |
| CO4 | H | M | M | M | | | | | L | | |
| CO5 | H | M | | H | | | | | | | |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME** : Diploma Programme in IF / CM / EL
**COURSE** : Fundamentals of Electrical Technology (FET) **COURSE CODE** : 6113

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 04 | -- | 02 | 06 | 03 | Max. | 80 | 20 | 100 | -- | -- | 50 | 150 |
| | | | | | Min. | 32 | -- | 40 | -- | -- | 20 | -- |

## 1.0 RATIONALE:

This course is introduced in the curriculum of Information technology, Computer technology and Electronics & Telecommunication Engineering to understand basic principles of electric devices & circuits & also to understand the operations of electrical drives. Student can apply knowledge to solve the electrical problems in their field.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Understand basics of electrical power.
2. Know various laws of AC and DC circuits.
3. Derive various terms of related to electrical circuits and machines
4. Understand construction, working and applications of various types of motor.
5. Describe need and circuit operations of UPS and stabilizers
6. Understand safety precautions while working with electrical installations
7. Understand Battery construction and maintenance
8. Understand wiring system for installations

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Apply basic terms and laws of electricity to understand an electric circuit operation.
2. Identify and state type of induced emf.
3. Derive and calculate various electrical parameters related to electrical circuit.
4. Explain transformer working principle and calculate its parameter.
5. Identify applications of DC motor and stepper motor.
6. State various single phase induction motor, know its applications
7. Compare Online and Offline state of UPS and know specification of batteries.
8. List various component with specifications used for electrical installation
9. Practise safety precaution while working with electrical installation.

**4.0 COURSE DETAILS:**

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Fundamentals of Electricity** | 1a. State Ohm's law<br>1b. Define various terms of electricity<br>1c. Solve series and parallel resistive network.<br>1d. Understand and apply Kirchhoff's laws<br>1e. Describe temperature coefficient of resistance<br>1f. State definitions of work, power and energy and its SI units<br>1g. Apply various effect of electric current<br>1h. Apply various rules. | 1.1 Electrical potential, current resistance, ohm's law<br>1.2 Electrical circuits, series & parallel resistance, current & voltage distribution, Kirchhoff's laws & its applications<br>1.3 Temperature coefficient of resistance<br>1.4 Work, power, energy, the SI units<br>1.5 Effects of electric current – magnetic chemical, heating effect. Fleming's rules, rights hand gripping rule. | 08 |
| **Unit-II**<br><br>**Electromagnetic induction** | 2a. Describe and apply Faradays law of Electromagnetic induction.<br>2b. Distinguish between static and dynamically induced emf<br>2c. Define self and mutually induced emf.<br>2d. State Lenz's law<br>2e. Explain and calculate energy stored in magnetic field. | 2.1 Faradays laws of electromagnetic induction Flaming right hand rule<br>2.2 Static & dynamically induced emf, Lenz's law, self & mutual inductance.<br>2.3 Energy stored in magnetic field | 06 |
| **Unit-III**<br><br>**AC fundamentals** | 3a. Differentiate between single phase and three phase AC supply<br>3b. Define terms related to alternating quantity.<br>3c. Differentiate between RMS and average values of alternating quantity.<br>3d. Elaborate concept of reactance and impedance &power factor.<br>3e. Solve simple numerical on AC circuit.<br>3f. Differentiate between Star and Delta network. | 3.1 Single phase & three phase AC supply<br>3.2 Concept of Cycle, Time period, Frequency, amplitude, RMS & average values of an Alternating quantity<br>3.3 Voltage & current relationship for pure resistive, inductive & capacitive circuits [No derivation]<br>3.4 Concept of reactance impedance, power factor, simple AC circuits & simple numerical based on it.<br>3.5 Current, voltage & power relationship for balanced three phase star & delta connected systems. | 10 |
| **Unit-IV**<br><br>**Single phase transformer** | 4a. State Principle and function of the transformer<br>4b. Identify parts and types of transformer<br>4c. Derive emf and transformation ratio equation of transformer<br>4d. Describe various losses of transformer<br>4e. Calculate regulation and | 4.1 Single Phase Transformer: Function & principle of operation, construction, classification of transformer according to construction and Voltage level.<br>4.2 EMF equation, voltage ratio, turns ratio, Current ratio, kVA rating. (Simple numerical)<br>4.3 Regulation, losses in | 06 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | efficiency of transformer<br>4f. Explain Isolation and pulse transformer. | transformer, efficiency. (Simple numerical)<br>4.4 Isolation transformer and pulse transformer. | |
| **Unit-V**<br><br>**DC Motor** | 5a. Explain constructional details of DC shunt motor.<br>5b. Describe working of DC shunt motor.<br>5c. Explain types and working of Stepper motor.<br>5d. Know applications of motors. | 5.1 DC Shunt motor: Working principle, construction, operation, applications.<br>5.2 Stepper motor : types, working, applications | 08 |
| **Unit-VI**<br><br>**Single Phase Induction motor** | 6a. Enlist types of single phase induction motor<br>6b. Explain working of single phase induction motor<br>6c. Know applications of single phase induction motor. | 6.1 Single phase induction motor :Construction, Classification, working and its applications | 06 |
| **Unit-VII**<br><br>**UPS & stabilizers** | 7a. Elaborate necessity of UPS<br>7b. Differentiate between online and offline UPS<br>7c. Draw block diagram of UPS<br>7d. Write function of each part of UPS<br>7e. Describe use and types of batteries used in UPS<br>7f. Define charging and discharging of batteries<br>7g. State meaning of Tickle charging<br>7h. Define Ampere hour capacity of battery, Specification of UPS.<br>7i. Elaborate maintenance need and schedule of batteries.<br>7j. Explain need of stabilizers<br>7k. Describe function of each part of stabilizers. | 7.1 UPS: necessity of UPS for computers,<br>7.2 Concept of on line and off line UPS,<br>7.3 Block diagram of simple UPS, function of each block in short,<br>7.4 Concept of cell/ battery, Types of batteries in PS,<br>7.5 Meaning of charging, discharging, & Tickle charging of battery. Ampere--hours capacity of battery<br>7.6 Maintenance of lead acid cell<br>7.7 Specification related with UPS & their meaning.<br>7.8 Stabilizers -- (Servo): necessity of stabilizers for computers, block diagram, functions of each block. | 07 |
| **Unit-VIII**<br><br>**Electrical Wiring** | 8a. Identify types of wires<br>8b. Explain types of wiring system used for computer room<br>8c. Differentiate between light and power circuit. | 8.1 Electrical wiring: Types of wires, meaning of 1\18, 3\20, 7\20 wires,<br>8.2 Simple wiring system like casing capping, Conduit wiring.<br>8.3 Meaning of power & lighting circuits used in computer room by giving layout of wiring diagram of small computer room. | 07 |
| **Unit-IX**<br><br>**Electrical Safety** | 9a. Enlist types of fuses<br>9b. Describe Function of earthing, MCCB, ELCB<br>9c. Explain types of earthing<br>9d. Elaborate Safety precautions. | 9.1 Necessity of Fuses, MCCB, ELCB, Types of fuses,<br>9.2 Necessity of Earthing, Earthing types, plate & pipe earthings. | 06 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | | 9.3 Safety practices and Precautions to be taken while working with electrical installation. | |
| | | **TOTAL** | **64** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

| Unit No. | Unit Title | Distribution of Theory Marks | | | |
|---|---|---|---|---|---|
| | | R Level | U Level | A and above Levels | Total Marks |
| I | Fundamentals of Electricity | 04 | 04 | 04 | 12 |
| II | Electromagnetic induction | 02 | 06 | 02 | 10 |
| III | AC fundamentals | 02 | 04 | 04 | 10 |
| IV | Single phase transformer | 02 | 04 | 02 | 08 |
| V | DC Motor | 02 | 04 | 02 | 08 |
| VI | Single Phase Induction Motor | 02 | 04 | 02 | 08 |
| VII | UPS & stabilizers for computers | 02 | 06 | -- | 08 |
| VIII | Electrical Wiring | 02 | 06 | -- | 08 |
| IX | Electrical Safety | 04 | 04 | -- | 08 |
| | **TOTAL** | **22** | **42** | **16** | **80** |

**Legends:** R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

**Note**: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.

| Sr. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. required |
|---|---|---|---|
| 1 | I | Verification of ohm's law | 02 |
| 2 | I | Measurement of current & voltage in series resistive circuits. | 02 |
| 3 | I | Measurement of current & voltage in parallel resistive circuits. | 02 |
| 4 | I | Verification of Kirchhoff's current law and Kirchhoff's voltage law. | 04 |
| 5 | III | Verification of Resistance with temperature. | 02 |
| 6 | III | Verification of current & voltage relationships for. I ) star connection II) Delta connection. | 06 |
| 7 | IV | Voltage & current ratio of a single--phase transformer. | 04 |
| 8 | V | Study of D.C machines parts. | 02 |
| 9 | VII | Demonstration of different parts of UPS, servo stabilizers, writing down of specification of UPS & their meaning. | 04 |
| 10 | VIII | Demonstration of different types of wires, wiring systems, switches & accessories by visiting to computer laboratory in institute. (Report | 04 |

| Sr. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. required |
|---|---|---|---|
| | | should be written on it) | |
| | | **TOTAL** | **32** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Study of Panel wiring for IT panels & racks by observation through visits.
2. Collect at least one example of electrical Equipment/ Machines representing types of induced emf.
3. Collect information of domestic appliances which driven by single phase induction motor.
4. Observe and enlist use of stepper motor in computer peripherals.
5. Measure gauge of electrical wire find its current carrying capacity.

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

Not applicable

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Basics of electrical Engineering | V. N. Mittal | Tata McGraw Hill |
| 2 | Electrical Technology Vol. I &II | B.L. Theraja | S. Chand & Co. |
| 3 | Fundamentals of Electrical Engineering | M.N. Mittal | Everest Publishers House |
| 4 | A Course in Electrical & Electronic Measurement & Instrumentation | A.K. Sawhney | Tata McGraw Hill |
| 5 | Electrical Technology | Edward Hughes | E.L.B.S. |

### B) Software/Learning Websites

1. http://www.howstuffworks.com

### C) Major Equipment/ Instrument with Broad Specifications

1. Three phase Auto transformer
2. Single Phase Transformer
3. Resistive load bank
4. Demo model of DC Machine
5. UPS

## 10.0 MAPPING MATRIX OF PO'S AND CO'S:

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **PO1** | **PO2** | **PO3** | **PO4** | **PO5** | **PO6** | **PO7** | **PO8** | **PO9** | **PO10** | **PO11** |
| CO1 | H | | L | | | | | | | | |
| CO2 | H | | | | L | | | | | | |
| CO3 | | | H | H | | | | | | | |
| CO4 | H | | | H | L | | | | | | |
| CO5 | H | | | | H | | | | | | |
| CO6 | H | | | | L | | | | | | |
| CO7 | | H | | | M | L | | | | | |
| CO8 | H | | | | M | L | | H | | | |
| CO9 | | | H | | | | | M | | M | |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME :** Diploma Programme in Information Technology(IF) / Computer Technology(CM)
**COURSE :** Computer Fundamentals and Organization (CFO) **COURSE CODE :** 6117

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 02 | -- | 04 | 06 | 03 | Max. | -- | -- | -- | -- | -- | 50 | 50 |
| | | | | | Min. | -- | -- | -- | -- | -- | 20 | -- |

## 1.0 RATIONALE:

This course provides a broad foundation for students so that they will get basic knowledge of using personal computers and internet. It describes the structure of computer and basic operations on computer as well as its peripherals. It provides a brief introduction to computer concepts, introduction of operating system and practical hands on office packages and uses of internet.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Use a computer system that has hardware and software components, which controls and makes them useful.
2. Use and handle the operating system as the interface to the computer system.
3. Set the parameter required for effective use of hardware combined with and application software's.
4. Use file mangers, word processors, spreadsheets, presentation software's and Internet.
5. Have hands on experience on operating system and different application software.
6. Use the Internet to send mail and surf the World Wide Web.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Describe a computer system and hardware and software components.
2. Recognize the use of different operating systems.
3. Use Microsoft Office and DTP package
4. Use the Internet
5. Use the computer system in various domains

## 4.0 COURSE DETAILS:

| Units | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Introduction to Computers** | 1a. Introduction to computers<br>1b. Types & Applications of computers<br>1c. Concept of hardware<br>1d. The system Unit<br>1e. Components of computer | 1.1 Generations & classification of computers<br>1.2 Micro, Mini, Mainframes and Super—Computers Applications of computers<br>1.3 Concept of hardware & Architecture of computer<br>1.4 Input unit, output unit, system unit--Computer peripherals--motherboards, memory, daughter cards, SMPS, connectors<br>1.5 Monitor, Mouse, Keyboard, Disk, CPU, Printer, Scanner, Modem, Video, Sound cards, Speakers. | 06 |

| Units | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-II**<br><br>**Introduction to OS** | 2a. Concept of windows accessories. | 2.1 Introduction to OS GUI<br>2.2 Concepts of single user & multiuser OS with examples.<br>2.3 Windows-Concepts, Basic Operation of windows, windows accessories:<br>2.4 Notepad, Word Pad, Paint.<br>2.5 Linux Os – Concepts, Open office & their application.<br>2.6 Comparison of Windows & Linux. | 04 |
| **Unit-III**<br><br>**Office & DTP Package** | 3a. Introduction to MS-OFFICE<br>3b. 3b.Introduction to Desktop Publishing (DTP) Software<br>3c. 3c GUI Based Editing, Spreadsheets, Tables & Presentation<br>3d. Open Office in Linux | 3.1 Word<br>3.2 Excel<br>3.3 PowerPoint<br>Access<br>3.4 PageMaker<br>3.5 Application Using MS Office 2000 & Open Office.Org Menus<br>3.6 Opening of menus, Toolbars: standard toolbars, formatting toolbars & closing of menus Quitting Document, Editing & designing your document<br>3.7 Spreadsheets<br>a. Word Processor<br>b. Spreadsheet<br>Presentation | 08 |
| **Unit-IV**<br><br>**Introduction to Internet** | 4a. Internet | 4.1 Concept of Internet<br>4.2 Hardware and software requirement for internet--setup<br>4.3 Internet Services & application<br>4.4 Internet Security<br>4.5 Search Engines<br>E-commerce | 06 |
| **Unit-V**<br><br>**Usage of Computer System in various Domains** | 5a. Computer application | 5.1 Offices, books publication, data analysis, accounting, investment, inventory control, graphics, database management, Instrumentation, Airline and railway ticket reservation, robotics, artificial intelligence, military, banks, design and research work, real-time, point of sale terminals, financial transaction terminals. | 08 |
| | | **TOTAL** | **32** |

**Legends:** R = Remembrance (Knowledge); U= Understanding; A= Application and above levels (Revised Bloom's taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 5.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

**Note**: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.

| Sr. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. Required |
|---|---|---|---|
| 1 | I, II | Assignments on computer system and its Architecture, peripherals. | 04 |
| 2 | II | Installation of Operating System like Windows XP/Vista/Windows 7, Linux. | 04 |
| 3 | II | Working with Windows desktop, start icon, taskbar, Recycle Bin, My Computer icon, The<br>Recycle Bin and deleted files Creating shortcuts on the desktop, concept of folders and files?<br>Folder selection techniques, Folder creation<br>Moving or copying files, Renaming, Deleting files and folders. | 04 |
| 4 | II | Introduction to Window Operating System & its Accessories-- Paint, Explorer, WordPad,<br>Notepad, The Calculator, Clock | 04 |
| 5 | II | Introduction to Linux OS & its accessories. | 04 |
| 6 | III | Implementation of features like auto correct, auto format, spells check, insert, table handling etc in Ms--Word. | 04 |
| 7 | III | Page formatting What is page formatting? Page margins Page size and orientation<br>Page breaks, Headers and footers | 04 |
| 8 | III | Implements Formulas, functions and named ranges in MS-EXCEL. | 04 |
| 9 | III | Design a worksheet in MS-- Excel for Employee payroll system with conditional formatting. | 04 |
| 10 | III | Design presentations with Microsoft Power Point.<br>Slides and presentations, Opening an existing presentation, Saving a presentation and design slide show giving animation effect. | 04 |
| 11 | III | Creation of tables using DBMS tools – MS Access.<br>(Teachers should frame their own assignments for above tools which covers maximum features provided by respective software's) | 04 |
| 12 | III | Design Business card, Wedding Invitation Card using Adobe page maker(DTP) software | 04 |
| 13 | II, III | Working with Linux open office – word, excel & presentation (openoffice.org). | 04 |
| 14 | II, III | Surfing the Internet<br>Surfing the web via Microsoft Internet Explorer<br>Surfing the Internet using Google chrome, mozilla<br>Searching the Internet using Yahoo<br>Commonly used search engines | 04 |
| 15 | IV | Generate your Email--ID using Email Service. Chatting on internet, searching and retrieval of information's using tools like Google. | 02 |
| 16 | IV | Using electronic mail<br>Starting Outlook Express<br>Using the Outlook Express window<br>Changing the window layout<br>Reading file attachment<br>Taking action on message-deleting, forwarding, replying,<br>Email & newsgroups<br>Creating and sending emails | 02 |

| Sr. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. Required |
|---|---|---|---|
| | | Attached files | |
| 17 | V | Introduction to e-commerce and related websites.<br>Railway reservations, electricity bill, telephone/mobile bill payments.<br>1 Visit to MSBTE, DTE websites.<br>2 Visit to Software/Hardware brand Company's websites such as - Lenova<br>Website, Intel website.<br>3 Search for latest configuration of Desktop Computer or laptop websites. | 04 |
| | | **TOTAL** | **64** |

## 6.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Compare and use working of different types of operating systems.
2. Assemble one system

## 7.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

Not Applicable

## 8.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Introduction to Computers | 1 Peter Norton | Tata McGraw Hill |
| 2 | Computer Fundamentals Architecture | B. Ram | New Age International |
| 3 | Windows 7 Inside Out | 3 Ed Bott Carl Siechert | Microsoft Press |
| 4 | Windows 7 or Windows XP For Dummies | Andy Rathbone | Wiley Publishing Inc |
| 5 | Structured computer Organization | Andrew S. Tanenbaum | Prentice Hall |
| 6 | Computer Fundamentals | V. Rajaraman | Prentice Hall |

### B) Software/Learning Websites

1. http://www.introductiontocomputers.org/
2. http://www.functionx.com/windows/index.htm
3. http://en.wikiversity.org/wiki/Introduction_to_Computers

### C) Major Equipment/ Instrument with Broad Specifications

1. **Hardware: Desktop Computer P-IV processor or higher**
2. Software: MSOFFICE 10/13

## 9.0 MAPPING MATRIX OF PO'S AND CO'S:

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **a** | **b** | **c** | **d** | **e** | **f** | **g** | **h** | **i** | **j** | **k** |
| CO1 | H | H | M | H | | | M | | | | M |
| CO2 | | H | M | L | | | L | | | | M |
| CO3 | | | | | | | L | | | | L |
| CO4 | L | M | | | | | | | | | H |
| CO5 | | M | H | H | | | | | | L | H |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME :** Diploma Programme in Information Technology(IF) / Computer Technology(CM)
**COURSE :** Elements of Electronics (EOE) **COURSE CODE :** 6118

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 04 | -- | 02 | 06 | 03 | Max. | 80 | 20 | 100 | -- | -- | 50 | 150 |
| | | | | | Min. | 32 | -- | 40 | -- | -- | 20 | -- |

## 1.0 RATIONALE:

This Course deals with fundamental devices used in all electronic circuits. The foundation for the working of computer or any of its peripherals is electronics. An Element of Electronics is a core Course which will help to students in understanding Digital Techniques, Microprocessors, Computer Architecture and Maintenance.

Students will develop proficiency in construction, working principle, characteristics and applications of electronic devices. On completion of learning of this Course, the student will have an insight to identify, classify different electronic devices assemble and troubleshoot simple electronic circuits.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Appreciate the importance of electronics in computer systems.
2. Compare and categorize Active and Passive Components.
3. Understand the construction and characteristic of semiconductor devices.
4. Understand the working of basic circuits such as rectifiers, Filters, amplifiers etc.
5. Build and test simple circuit.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes**:**

1. Identify the different Active and Passive Elements.
2. Illustrates the principle of working of simple electronic circuits.
3. Assemble Simple electronic circuits.
4. Troubleshoot the fault in a given circuit.
5. Identify faulty component/s in a given circuit.

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes<br>Course Outcomes | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Passive Circuit Elements** | 1a. Classify different Active and passive Components.<br>1b. Compare Active and Passive Components<br>1c. Estimate resistance value of Resistors using color code method.<br>1d. State the Specifications of a Resistor, Capacitor and an Inductor.<br>1e. Draw the sketch of different types of Resistors, Capacitors and Inductors and state their principle of | 1.1 Definition and application areas of Electronics.<br>1.2 Types of Electronic Components: Active & Passive-Definition and comparison.<br>1.3 Types of passive components: Resistor, Inductors and Capacitors<br>1.4 Resistors: Resistance, Definition, Symbol, Unit, Specifications Classification of Resistors – Fixed, Variable Resistor color coding<br>1.5 Capacitors: Capacitance, | 10 |

| Unit | Major Learning Outcomes<br>Course Outcomes | Topics and Sub-topics | Hours |
|---|---|---|---|
| | working. | Definition, Symbol, Unit, Specifications Classification – Fixed and Variable<br>1.6 Inductors: Inductance, Definition, Symbol, unit, specifications, Classification: Fixed and Variable | |
| **Unit-II**<br><br>**Semiconductor diodes** | 2a. Draw Symbols of different kinds of diodes.<br>2b. Draw constructional sketch of different diodes and state working principle.<br>2c. Draw circuit and explain operation of different types of diodes in forward and reverse biased condition.<br>2d. Draw & Explain VI Characteristics of Diodes.<br>2e. State applications of various diodes. | 2.1 P-N Junction Diode: Symbol, construction, Working Principle, Formation of depletion layer in PN junction, Barrier Voltage. Biasing of the P-N Junction diode: Forward Bias, Reverse bias, VI characteristics(Forward and Reverse characteristics), Diode specifications: Forward voltage, Peak Inverse voltage, Reverse Saturation Current<br>2.2 Types of Diodes<br>• Zener Diode- Symbol, Operating Principle, V-I Characteristics, Zener Breakdown Voltage, Zener diode as a voltage regulator<br>• Optical diodes: Symbol, operating Principle, V-I Characteristics, applications of LED | 12 |
| **Unit-III**<br><br>**Regulated Power Supply** | 3a. State Necessity of Regulated power supply and Draw Block diagram of it.<br>3b. Define rectifiers and state its necessity.<br>3c. Categorize and compare different rectifiers.<br>3d. Draw circuit diagram and explain operation of Half and full wave rectifiers with input and output waveforms.<br>3e. Define various terms related to rectifiers like Ripple Factor, Efficiency and PIV.<br>3f. Define filter and state its necessity.<br>3g. Draw circuit diagram and explain operation L, C, LC and CLC filters with Input-Output Waveforms.<br>3h. Define Voltage regulator and state its necessity. | 3.1 D.C Power Supply: Types- Regulated and Unregulated, Need of Regulated Power Supply, Basic Block Diagram of Regulated Power Supply<br>3.2 Rectifiers: Definition, Need for Rectification.<br>3.3 Types of Rectifiers- Half wave Rectifier, Full Wave Rectifier (Centre Tapped and Bridge )– Circuit diagram, Operation and input- output Waveforms(No derivations), Definition of Ripple Factor, Efficiency, PIV, Comparison of Rectifiers<br>3.4 Filters: Definition, Necessity of Filters. Types of Filters – L, C, LC, CLC- Circuit Diagram, working with Input- Output Waveform. Comparison of Filters<br>3.5 Voltage regulators: Necessity, IC Regulators: 78XX, 79XX. | 12 |
| **Unit-IV** | 4a. Compare between Unipolar and bipolar junction | 4.1 Introduction to Unipolar and Bipolar junction Transistors | 14 |

| Unit | Major Learning Outcomes<br>Course Outcomes | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Transistors** | transistor.<br>4b. Explain working principle of NPN and PNP transistor.<br>4c. Draw the circuit diagram and Input/output Characteristics of CE Configuration of transistor.<br>4d. Identify and label different regions of operation of transistor on output characteristics.<br>4e. Draw construction diagram of N and P channel JFET and Draw Drain, Transfer characteristics of N Channel JFET.<br>4f. Compare between BJT and JFET<br>4g. state various applications of BJT and JFET | 4.2 Bipolar junction Transistors: Definition, Types (PNP, NPN) Symbol, Working Principle of NPN transistor, Types of Transistor Configurations: CE, CB (Only circuit Diagrams), Characteristics of CE configuration: Input /Output Characteristics. Identification of Cut off, Active and Saturation Region, Input resistance, Output Resistance, Current gain ($\alpha$ and $\beta$).<br>• Transistor Biasing- Need for biasing, DC load line, Q-point, Types of biasing – Voltage divider bias Transistor as a switch- circuit Diagram, Operation, application<br>4.3 Unipolar junction Transistors: Types ( JFET and MOSFET)<br>• JFET:N Channel and P channel – Symbol, Construction and working principle, Characteristics of N Channel JFET – Drain and Transfer Characteristics,<br>4.4 Comparison of JFET and BJT<br>4.5 Applications of BJT and FET. | |
| **Unit-V**<br><br>**BJT Amplifiers and Oscillators** | 5a. Define an amplifier and oscillator.<br>5b. Draw circuit diagram of single stage CE amplifier and explain working of CE amplifier.<br>5c. Define various terms Bandwidth, Current gain, Voltage gain and Power gain.<br>5d. State necessity of multistage amplifier& types of Coupling used in design of multistage amplifier.<br>5e. Draw circuit diagram of RC coupled, Direct coupled CE amplifier and state function of each component of circuit.<br>5f. List applications of each type of multistage amplifier.<br>5g. State the necessity of Oscillators. | 5.1 BJT as an amplifier- Single Stage CE amplifier, Circuit Diagram, function of components, working and frequency response of an amplifier<br>5.2 Definition of terms Bandwidth, Current gain, Voltage Gain and Power Gain<br>5.3 Multistage amplifiers: Need for multistage amplifier Types of Coupling: RC coupled, Direct Coupled- Two stage amplifiers(CE)-Circuit Diagram, Frequency response and Function of each component Application of each type of multistage Amplifiers<br>5.4 Oscillators: Definition, Need for oscillators<br>5.5 Crystal Oscillator: Circuit Diagram, Operating principle and application | 14 |

| Unit | Major Learning Outcomes<br>Course Outcomes | Topics and Sub-topics | Hours |
|---|---|---|---|
| | 5h. Draw circuit diagram of Crystal Oscillator circuit and explain its working principle. | | |
| **Unit-VI Integrated Circuits** | 6a. Classify Integrated circuits.<br>6b. State advantages and Disadvantages of ICs.<br>6c. state various IC packages | 6.1 Integrated Circuits: Definition, Advantages and Disadvantages<br>6.2 Classification – Analog and Digital ICs.<br>6.3 IC Packing's: DIP, Metal can, plastic | 02 |
| | | **TOTAL** | **64** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

| Unit No. | Unit Title | Distribution of Theory Marks | | | |
|---|---|---|---|---|---|
| | | R Level | U Level | A Level | Total Marks |
| I | Passive Circuit Elements | 02 | 02 | 02 | 06 |
| II | Semiconductor diodes | 06 | 08 | 02 | 16 |
| III | Regulated Power Supply | 04 | 10 | 04 | 18 |
| IV | Transistors | 04 | 12 | 04 | 20 |
| V | BJT Amplifiers and Oscillators | 04 | 08 | 04 | 16 |
| VI | Integrated Circuits | 02 | 02 | -- | 04 |
| | **TOTAL** | **22** | **42** | **16** | **80** |

**Legends:** R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

***Note**: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

| S. No. | Unit No. | Practical Exercises<br>(Outcomes in Psychomotor Domain) | Approx. Hrs. required |
|---|---|---|---|
| 1 | I | Describe different tools and equipments used in basic electronic laboratory<br>• Identify different Active and Passive circuit Elements. | 04 |
| 2 | I | Test and measure values of resistors and capacitors. | 02 |
| 3 | II | Plot VI characteristics of PN-Junction Diode and infer from it. | 02 |
| 4 | II | Assemble forward and reverse characteristics circuit of zener Diode on breadboard and plot VI Characteristics. | 04 |
| 5 | III | Observe the input/output waveforms of HWR rectifier on CRO<br>• Without filter.<br>• With filter and infer from it. | 04 |
| 6 | III | Observe the input/output waveforms of FWR rectifier on CRO | 04 |

| S. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. required |
|---|---|---|---|
| | | • Without filter.<br>• With filter and infer from it. | |
| 7 | IV | Plot Input & output characteristics of transistor in CE mode and infer from it. | 04 |
| 8 | IV | Assemble and study the circuit of transistor as switch on breadboard. | 02 |
| 9 | V | Plot Frequency response of single stage RC coupled amplifier and calculate Bandwidth and infer from it. | 02 |
| 10 | V | Plot Frequency response of Two stages RC coupled amplifier (CE mode) and calculate Bandwidth and infer from it. | 02 |
| 11 | VI | Identify and test different ICs. | 02 |
| **TOTAL** | | | **32** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like:

1. Download data sheets of Diodes (IN4001-IN4007), Transistors (BC546 BC547 BC548) and Voltage regulator ICs like 78xx, 79xx.
2. Market survey to collect data about Prices of different electronic Components and devices.
3. Assemble small/simple electronic circuit on breadboard.
4. Prepare layout and artwork of HWR and FWR circuit using PCB making software.
5. Visit to PCB making or assembling industry and collect data.

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Show animation videos to demonstrate the working principles and constructional features of different types of electronic devices and circuits.
2. Arrange expert lecture of an Industry Person/Trained Faculties in the area of core electronics.
3. Arrange an Industrial visit to PCB Making/ Assembling industry.

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Principles of Electronics | V.K. Mehta | S. Chand ISBN:8121924502, 9788121924504 |
| 2 | A textbook of Applied Electronics | R.S. Sedha | S. Chand, 1st Edition |
| 3 | Basic Electronics and Linear Circuits | Bhargava (N.N.), Kulshreshtha (D.C.) and Gupta (S.C.) | Tata McGraw-Hill Education Pvt. Ltd. ISBN 10- 0074519654 /13 : 9780074519653 |
| 4 | Electronic Principles | Albert Malvino | Tata McGraw-Hills |

### B) Software/Learning Websites

1. http://www.alldatasheet.com
2. http://www.electronicstheory.com
3. http://www.electronictutorial.com
4. http://www.allaboutcircuit.com

**C) Major Equipment/ Instrument with Broad Specifications**

1. Multimeters, Ammeters, Analog Voltmeters
2. Cathode ray oscilloscope
3. Regulated power supply
4. Breadboards
5. V-I Characteristics of PN junction diode – Experimental kit
6. HWR and FWR – Experimental kit
7. Input/output Characteristics of CE mode Transistor – Experimental kit
8. single stage RC coupled amplifier – Experimental kit
9. Two stages RC coupled amplifier (CE mode) – Experimental kit
10. IC Tester

**10.0 MAPPING MATRIX OF PO'S AND CO'S:**

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **a** | **b** | **c** | **d** | **e** | **f** | **g** | **h** | **i** | **j** | **k** |
| CO1 | H | L | L | | | | | | | | L |
| CO2 | L | | H | | | | | | | | L |
| CO3 | L | | H | | | | | | | M | |
| CO4 | L | L | | | | | | | | M | |
| CO5 | L | L | | | | | | | | M | |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME** : Diploma Programme in Information Technology(IF) / Computer Technology(CM)
**COURSE** : Computer Workshop Practice (CWP) **COURSE CODE** : 6119

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| -- | -- | 04 | 04 | -- | Max. | -- | -- | -- | -- | -- | 50 | 50 |
| | | | | | Min. | -- | -- | -- | -- | -- | 20 | -- |

**1.0 RATIONALE:**

To make student aware with the use of various peripherals used in computer and how to connect them so that student can understand overall computer system.

**2.0 COURSE OBJECTIVES:**

The student will be able to,

1. Installed windows and Linux Operation System.
2. Explain and Use External Peripheral Devices.
3. Explain and Use Internal Peripheral Devices.
4. Connect different Peripheral Devices.
5. Setup Local Area Network.

**3.0 COURSE OUTCOMES:**

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Installation of various Operating Systems
2. Understand and use internal peripheral devices.
3. Understand and use external peripheral devices.
4. Connect different Peripheral Devices.
5. Setup Local Area Network.

**4.0 COURSE DETAILS:**

**Note: The related theoretical contents be taught during practical**

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics |
|---|---|---|
| **Unit-I**<br><br>**Operating System Installation** | 1a. Describe Windows 7/8/10 OS or latest Installation<br>1b. Describe Ubuntu Linux OS Installation | 1.1 Introduction and Features of windows OS<br>• Installation<br>• Hard disk partition<br>1.2 Introduction and Features of Linux OS<br>• Installation<br>• Hard disk Partition |
| **Unit-II**<br><br>**Introduction to Various External Peripheral Devices** | 2a. Describe different types of hardware<br>2b. Use of different types of hardware. | 2.1 Different types of keyboards<br>2.2 Different types of Mouse<br>2.3 Different types of Scanners<br>2.4 Different types of Modems<br>2.5 Different types of printers<br>2.6 CD writers, speakers, CD read /write drive<br>2.7 Microphones, LCD projectors, Pen drives, DVD drive Different types of Monitors |
| **Unit-III**<br><br>**Introduction to Various Internal** | 3a. Describe Internal Devices | 3.1 Different makes of hard disks<br>3.2 Different types of network Interface cards<br>3.3 Different types of cables such as data cables, printer cables, network cables, power cables etc. |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics |
|---|---|---|
| **Devices** | | 3.4 Motherboard Installation<br>3.5 Graphics Card Installation<br>3.6 Network Interface Card (NIC) Installation |
| **Unit-IV**<br><br>**Physical Connections of different peripheral Devices** | 4a. Describe Connecting different peripheral devices | 4.1 Connection of Mouse to different ports<br>4.2 Connection of keyboards to different ports<br>4.3 Connection of Monitors<br>4.4 Connection of Printers (installation of printers).<br>4.5 Different switch settings of printers<br>4.6 Printer's self test<br>4.7 Jumper settings of hard disks<br>4.8 Attaching HDD and CD drives<br>4.9 Attaching Pen Drives and DVDs<br>4.10 Attaching Scanners |
| **Unit-V**<br><br>**Networking** | 5a. Describe Types of Networks<br>5b. Observe Network devices<br>5c. Identify and use of networking tool | 5.1 Introduction to LAN, MAN, WAN<br>5.2 Setup LAN<br>5.3 Use of router<br>5.4 connection to switch<br>5.5 connecting RJ 45 connector to cat 6 cable |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Not Applicable

**Legends:** R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignment/task should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the desired programme outcome/course outcome.

***Note**: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in the mapping matrix for this course. Faculty should ensure that students also acquire Programme Outcomes/Course Outcomes related to affective domain.*

| S. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Hours |
|---|---|---|---|
| 1 | I | Installation of windows operating system | 07 |
| 2 | I | Installation of Ubuntu Linux operating system | 07 |
| 3 | II, III | Observe all the peripheral devices available in the lab. Describe them in detail. | 16 |
| 4 | IV, V | Study of different ports such as serial, parallel, PS/2, RJ 45, USB ports. | 11 |
| 5 | IV | Observe different printer settings on different types of printers available in your lab. | 11 |
| 6 | V | Crimp cat 6 cable with RJ 45 connector | 12 |
| **TOTAL** | | | **64** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Discuss features of different Operating Systems.
2. Collect specification of latest internal and external peripheral devices.
3. Dismantle all the connections of computer and try to connect them.

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Arrange expert seminar of industry person in the area of hardware and maintenance.

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Troubleshooting Your PC | Mr. David Stone & Alfred Poor | Prentice Hall India |
| 2 | A+ Complete | David Groth | BPB Publication |
| 3 | Computer Installation and Servicing | Balasubramaniam | Tata McGraw Hill |
| 4 | Reference Manuals of PC troubleshooting and maintenance | Manuals | -- |

### B) Software/Learning Websites

1. http://www.tutorialspoint.com/computer_fundamentals/computer_hardware.htm
2. http://www.tutorialspoint.com/computer_fundamentals/computer_networking.htm
3. http://windows.microsoft.com/en-us/windows/installing-reinstalling-windows#1TC=windows-7.
4. http://www.wikihow.com/Install-Ubuntu-Linux

### C) Major Equipment/ Instrument with Broad Specifications

| Sr.No. | Equipment | Specification |
|---|---|---|
| 1 | Desktop Computer | Processor: intel core i5, Memory: at least 4GB RAM<br>Hard drive: at least 320GB hard disk |
| 2 | LCD Projector | Display Type: LCD, Light Output: 3200 Lumens |
| 3 | Network Printer | Printing Type: Black and White<br>Printing Technology: Laser<br>Print Resolution: 1200x1200 DPI |
| 4 | Switch | 24 port switch |
| 5 | Router | Wireless standard: IEEE 802.11, 802.3<br>SSID Support : Yes, Frequency: 2.48 GHz<br>WAN Type: RJ-45, DHCP: Yes |
| 6 | Scanner | Document Flatbed Scanner |
| 5 | Networking tool | Networking tool kit |

## 10.0 MAPPING MATRIX OF PO'S AND CO'S:

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i | j | k |
| CO1 | L | H | H | H | M | | | | | M | L |
| CO2 | | H | M | H | M | | | | | M | L |
| CO3 | L | | | H | | | M | | | | |
| CO4 | | H | M | M | | L | | | L | M | L |
| CO5 | | M | M | L | | | M | L | L | H | H |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME :** Diploma Programme in Information Technology(IF) / Computer Technology(CM)
**COURSE :** Microprocessor (MPO) **COURSE CODE :** 6234

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 04 | -- | 02 | 06 | 03 | Max. | 80 | 20 | 100 | -- | -- | 25 | 125 |
| | | | | | Min. | 32 | -- | 40 | -- | -- | 10 | -- |

## 1.0 RATIONALE:

Microprocessor is the heart of embedded system and computers. This course will provide basic knowledge of microprocessor architecture and programming in assembly language.
The student will be able to apply logics to various given problems and develop programs using assembly language construct that would help them to develop real time microprocessor based application programs.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Describe architecture and Operation of 8085 and 8086 microprocessor.
2. Recognize the function of various blocks of microprocessor, different types of Instructions, addressing modes of the 8085 and 8086 microprocessor.
3. Understand different steps involved and tools used in program development.
4. Write an assembly language program for desired application using 8086 microprocessor.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, Psychomotor and affective domain to demonstrate following course Outcomes:

1. Compare between basic and advanced Microprocessor.
2. Select a Microprocessor chip/IC for specific application.
3. Develop assembly language program for simple application.
4. Debug, test and execute various assembly language programs.

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Microprocessor Basics** | 1a. Define microprocessor and Differentiate between types of microprocessor<br>1b. State the Features of 8085 CPU.<br>1c. Describe the function of pins in the pin diagram of 8085 microprocessor with a sketch<br>1d. Describe the 8085 microprocessor architecture diagram with its functioning. | 1.1 Concept of Microprocessor, Evolution of Microprocessor and types.<br>1.2 Microprocessor Bus organization: Data Bus, Address Bus and Control Bus.<br>1.3 8085 Microprocessor: Salient features, Pin diagram and description, Architecture (Block diagram), Register organization, (Accumulator, Flag Register, Program Counter).<br>1.4 Concept of Stack, stack pointer | 10 |
| **Unit-II** | 2a. State the Features of | 2.1 Features of 8086 Microprocessor. | 12 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **8086 Microprocessor** | 8086 CPU.<br>2b. Describe pin diagram of 8086 microprocessor with a sketch.<br>2c. Describe the 8086 microprocessor architecture diagram with its functioning.<br>2d. Explain the instruction pipelining and memory segmentation.<br>2e. Explain the function of minimum and maximum mode signals of 8086 CPU.<br>2f. Compare various Microprocessors | 2.2 8086 CPU-Pin Diagram and description.<br>2.3 Architecture of 8086-Block diagram and description.<br>2.4 Register organization.<br>2.5 Concepts of pipelining, memory segmentation and Physical memory address generation.<br>2.6 Minimum and Maximum Mode operation (Signal Description).<br>2.7 Comparison of 8085 & 8086 CPU.<br>2.8 Comparison of 8088 & 8086 CPU | |
| **Unit-III**<br><br>**8086 Instruction Set** | 3a. State and explain different addressing modes of 8086 CPU.<br>3b. Classify instruction set of 8086 microprocessor.<br>3c. Explain with the help of syntax function of various 8086 CPU instructions. | 3.1 Machine Language Instruction format.<br>3.2 Addressing modes<br>3.3 8086 Instruction Set<br>• Arithmetic Instructions<br>• Logical Instructions<br>• Data transfer instructions<br>• Bit manipulation instructions<br>• String Operation Instructions<br>• Program control transfer or branching Instructions<br>• Processor Control Instructions | 12 |
| **Unit-IV**<br><br>**Basics of Assembly Language Programming** | 4a. Describe various program development steps.<br>4b. Write algorithm and draw flowchart for given program statement.<br>4c. State and explain the function of various program development tools.<br>4d. Illustrate the functions of assembler directive and operators. | 4.1 Program Development Steps<br>• Defining problem<br>• Writing Algorithms<br>• Flowchart<br>• Initialization checklist<br>• Choosing instructions<br>• Converting algorithms to assembly language programs<br>4.2 Program Development Tools<br>• Editor<br>• Assembler<br>• Linker<br>• Debugger<br>4.3 Assembler directives and Operators. | 08 |
| **Unit-V**<br><br>**8086 Programming** | 5a. Develop Basic assembly language program using basic instruction for the given program statement.<br>5b. Run program using | 5.1 Model of 8086 assembly language programs.<br>5.2 Simple assembly language programs - Addition, Subtraction, Multiplication, Division, series addition, 1's & 2's Complement, BCD addition, finding largest /Smallest number in array, | 14 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | assembler and linker.<br>5c. Debug program using debugger. | finding even & odd numbers in array, Finding Positive and Negative Numbers in array, String Related Programs- Block transfer, Reverse the string | |
| **Unit-VI**<br><br>**Procedure and Macro** | 6a. Define procedure and macros<br>6b. State and explain various types of Procedure<br>6c. Develop simple Assembly language Program using Procedure and macros | 6.1 Procedure<br>• Defining Procedure - Directives used, FAR and NEAR<br>• CALL and RET instructions.<br>• Reentrant and Recursive procedures.<br>6.2 Defining Macros.<br>6.3 Simple Assembly Language Programs using Procedure and Macros | 08 |
| | | **TOTAL** | **64** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

| Unit No. | Unit Title | Distribution of Theory Marks | | | |
|---|---|---|---|---|---|
| | | R Level | U Level | A Level | Total Marks |
| I | Microprocessor Basics | 04 | 08 | -- | 12 |
| II | 8086 Microprocessor | 04 | 08 | 04 | 16 |
| III | 8086 Instruction Set | 04 | 06 | 06 | 16 |
| IV | Basics of Assembly Language Programming | 02 | 06 | -- | 08 |
| V | 8086 Programming | 04 | 06 | 10 | 20 |
| VI | Procedure and Macro | -- | 04 | 04 | 08 |
| | **TOTAL** | **18** | **38** | **24** | **80** |

**Legends:** R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

**Note**: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.

| S. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. required |
|---|---|---|---|
| 1 | II | To study Pin Diagram and Architecture of 8086 Microprocessor. | 02 |
| 2 | V | Develop and Execute assembly language program for addition/subtraction of two 16 bit numbers. | 04 |

| S. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. required |
|---|---|---|---|
| 3 | V | Develop and Execute assembly language program to find sum of series of numbers. | 02 |
| 4 | V | Develop and Execute assembly language program to obtain 1's and 2's Complement of 8 bit number. | 02 |
| 5 | V | Develop and Execute assembly language program for multiplication of two 16 bit unsigned numbers. | 02 |
| 6 | V | Develop and Execute assembly language program for division of two unsigned numbers (16/8, 32/16). | 04 |
| 7 | V | Develop and Execute assembly language program for addition of two 8 bit BCD numbers. | 02 |
| 8 | V | Develop and Execute assembly language program to find smallest/ largest number from array of n numbers. | 04 |
| 9 | V | Develop and Execute assembly language program to find Odd/Even number from array of n numbers. | 04 |
| 10 | V | Develop and Execute assembly language program for moving string from one memory location to another (using string instruction). | 02 |
| 11 | V | Develop and Execute assembly language program to display the string in reverse order. | 02 |
| 12 | V | Develop and Execute assembly language program to Display the Message string on command prompt. | 02 |
| **TOTAL** | | | **32** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like:

1. Develop unit wise topics related programs in laboratory.
2. Prepare the charts of block diagram & pin diagram of 8085 and 8086 Microprocessor.
3. Prepare the charts of Instruction set of 8086 Microprocessor.
4. Collect data about prices, specifications of 8085 & 8086 Microprocessor from local market.
5. Prepare evolution chart for microprocessor families.

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Animation/Video presentation session.
2. Arrange expert lecture of an industry person.
3. Industrial visit to microprocessor based system manufacturing industry.

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Microprocessor Architecture Programming and Application | Ramesh Ganonker | Penram International |
| 2 | Advanced microprocessor & peripheral | A.K. Ray & K.M. Bhurchandi | Tata McGraw-Hill Edition ISBN: 0070606587 |
| 3 | Microprocessor & interfacing (programming & hardware) | Douglas Hall | Tata McGraw-Hill Edition ISBN:978007601673 |

### B) Software/Learning Websites

1. http://www.cpu-world.com/Arch/8085.html
2. http://www.cpu-world.com/Arch/8086.html
3. http://www.intel.com
4. www.nptel.iitm.ac.in

**C) Major Equipment/ Instrument with Broad Specifications**

1. Microprocessor 8086 Trainer kit
2. Computer Systems with minimum PIII processor (or equivalent) and 512 MB RAM.
3. Multimedia Projector
4. Simulation Software(Tasm/Masm)

**10.0 MAPPING MATRIX OF PO'S AND CO'S:**

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **a** | **b** | **c** | **d** | **e** | **f** | **g** | **h** | **i** | **j** | **k** |
| CO1 | M | L | | | | | | | | | |
| CO2 | L | H | L | | | | | | | L | |
| CO3 | L | | H | H | | | L | | | | L |
| CO4 | L | | H | H | | | L | | | M | L |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME :** Diploma Programme in Information Technology(IF) / Computer Technology(CM)
**COURSE :** Data Structure Using 'C' (DST) **COURSE CODE :** 6235

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 03 | -- | 04 | 07 | 03 | Max. | 80 | 20 | 100 | 50 | -- | 25 | 175 |
| | | | | | Min. | 32 | -- | 40 | 20 | -- | 10 | -- |

## 1.0 RATIONALE:

The primary objective of this course is to provide students ways of organizing data in computer so that it can be use efficiently. An emphasis on design and implementation of abstract data structures for solving complex problems.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Analyse data structure organization & classification.
2. Explain and apply sorting and searching techniques on data.
3. Apply the data structure stack, queue and link list in the application program.
4. Apply the data structure Trees and graphs in the application program.
5. Understand the use of data structure in real world applications.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Analyzed and used data structure organization & classification.
2. Used various Searching and sorting techniques for solving problems
3. Identified and applied abstract data types like stack, queue and Link List.
4. Select the appropriate data structure for real world applications.
5. Apply different searching and sorting techniques.
6. Apply different algorithms to solve the real world problem.

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Introduction to data structure:** | 1a. Define Basic Terminology<br>1b. List Operations on data structures<br>1c. Approaches to design an algorithm<br>1d. Estimate Complexity<br>1e. Interpret Big 'O' Notation | 1.1 Basic Terminology<br>• Elementary data structure organization<br>• Classification of data structure<br>1.2 Operations on data structures<br>• Traversing, Inserting, deleting<br>• Searching, sorting, merging<br>1.3 Different Approaches to designing an algorithm<br>• Top-Down approach<br>• Bottom-up approach<br>1.4 Complexity<br>• Time complexity<br>• Space complexity<br>1.5 Big 'O' Notation | 06 |
| **Unit-II** | 2a. Introduction to sorting<br>2b. Analysis Efficiency of | 2.1 Introduction<br>2.2 Efficiency of Sorting Algorithms | 10 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Searching & Sorting Methods** | sorting algorithms<br>2c. Explain and distinguish Sorting Techniques<br>2d. Explain Searching Techniques | 2.3 Searching Methods<br>• Linear search<br>• Binary search<br>2.4 Sorting techniques<br>• Bubble Sort,<br>• Selection Sort,<br>• Insertion Sort,<br>• Merge Sort,<br>• Radix Sort (only algorithm),<br>• Shell Sort (only algorithm),<br>• Quick Sort (only algorithm). | |
| **Unit-III**<br><br>**Stack and its Applications** | 3a. Introduction to stack<br>3b. Applications of Stack | 3.1 Introduction to Stack.<br>• Stacks as an Abstract Data Type<br>• Primitive operations of stacks<br>• Representation of Stack through arrays, linked list.<br>3.2 Application of Stack<br>• Reversing a list<br>• Polish notations<br>• Conversion of infix to postfix expression<br>• Evaluation of postfix expression<br>• conversion of infix to prefix expression<br>• Evaluation of prefix expression<br>• Recursion | 06 |
| **Unit-IV**<br><br>**Queue and its Applications** | 4a. Introduction to queue<br>4b. Types of queue<br>4c. Applications of Queues | 4.1 Introduction<br>• Queue as an Abstract Data Type<br>• Representation of Queues<br>• Operations on queue: Searching, Insertion, Deletion.<br>4.2 Types of Queue<br>• Circular Queues<br>• Double Ended Queue<br>• Priority Queue<br>4.3 Application of Queues | 06 |
| **Unit-V**<br><br>**Linked List** | 5a. Introduction to linked list<br>5b. Types of linked list<br>5c. Operations on linked list | 5.1 Introduction,<br>• Terminologies: Node, Address, Pointer, Information, Next, Null<br>• Pointer, Empty list etc.<br>5.2 Types of Linked list<br>• Linear list<br>• Circular list<br>• Doubly list<br>5.3 Operations on a singly linked list (only algorithm)<br>• Traversing a singly linked list<br>• Searching a linked list<br>• Inserting a new node in a linked list list at front, middle and end.<br>• Deleting a node from a linked list list from front, middle and end. | 06 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-VI**<br><br>**Trees** | 6a. Introduction to Trees<br>6b. Types of tree<br>6c. Expression tree | 6.1 Introduction<br>• Terminologies: tree, degree of a node, degree of a tree, level of<br>• a node, leaf node, Depth / Height of a tree, In-degree & out-Degree, Directed edge, Path, Ancestor & descendant nodes.<br>6.2 Tree Types and Traversal Methods<br>• Type of Trees<br>o General tree<br>o Binary tree<br>o Binary search tree (BST).<br>• Binary tree traversal (only algorithm)<br>o In order traversal<br>o Preorder traversal<br>o Post order traversal<br>6.3 Expression tree | 06 |
| **Unit-VII**<br><br>**Graph theory and its Applications** | 7a. Introduction to graphs.<br>7b. Graph Representation<br>7c. Explain Traversal of graphs<br>7d. Application | 7.1 Introduction<br>• Terminologies: graph, node (Vertices), arcs (edge), directed<br>• graph, in-degree, out-degree, adjacent, successor, predecessor,<br>• Relation, weight, path, length.<br>7.2 Representations of a graph<br>• Array Representation<br>• Linked list Representation<br>7.3 Traversal of graphs<br>• Depth-first search (DFS).<br>• Breadth-first search (BFS).<br>7.4 Applications of Graph | 08 |
| **TOTAL** | | | **48** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

| Unit No. | Unit Title | Distribution of Theory Marks | | | |
|---|---|---|---|---|---|
| | | **R Level** | **U Level** | **A and above Levels** | **Total Marks** |
| I | Introduction to data structure. | 04 | 04 | 02 | 10 |
| II | Searching & Sorting Methods. | 04 | 04 | 06 | 14 |
| III | Stack and its applications. | 04 | 04 | 04 | 12 |
| IV | Queue and its applications. | 04 | 04 | 04 | 12 |
| V | Linked List. | 04 | 04 | 02 | 10 |
| VI | Trees. | 02 | 04 | 04 | 10 |
| VII | Graph theory and its applications. | 02 | 04 | 06 | 12 |
| | **TOTAL** | **24** | **28** | **28** | **80** |

**Legends:** R = Remembrance (Knowledge); U= Understanding; A= Application and above levels (Revised Bloom's taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 7.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

***Note**: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

| S. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. Required |
|---|---|---|---|
| 1 | I | Implement various operations on one dimensional array. E.g. insertion and deletion. | 04 |
| 2 | II | Implement various sorting techniques. | 08 |
| 3 | II | Programs for implementing various searching techniques.<br>-Linear search<br>-Binary search | 08 |
| 4 | III | Implement PUSH and POP operations of stack using array | 04 |
| 5 | III | Implement recursive programs: factorial, Fibonacci series | 04 |
| 6 | III | Implement program to evaluate postfix expressions. | 04 |
| 7 | IV | Implement Program for demonstrating queue operations. | 08 |
| 8 | V | Implement Program based on singly Linked lists. | 08 |
| 9 | VI | Implement Program based on trees Creating a binary tree, in order, preorder and post order traversal of binary tree, deleting a node from binary tree. | 08 |
| 10 | VII | Assignment of Graph theory | 04 |
| 11 | I to VII | Compute the time and space complexity with Big 0 for following programs (Addition of 2 no's, Factorial of Number and Printing numbers from 1 to 10 using for loop) | 04 |
| | | **TOTAL** | **64** |

## 8.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Discuss various algorithms and its complexity.
2. Compare various searching and sorting methods.
3. Prepare seminars on various topics like stack, queue etc.

## 9.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Concept will be introduced in lectures using charts or ppt.
2. Arrange expert seminar of industry person in the area of data structure and algorithm.

## 10.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Fundamentals of data structure | Ellis Horowitz, Sartaj Sahni | TMH Publications |
| 2 | Data Structures | Tremble and Sorenson | TMH Publications |
| 3 | Teach Yourself data Structure and Algorithms in 24 Hours | Robert Lafore. | BPB Publication |
| 4 | Data Structures Using C | M. Radhakrishnan, V. Srinivasan | BPB Publications |

**B) Software/Learning Websites**

1. http://freevideolectures.com/Course/2519/C-Programming-and-Data-Structures
2. http://www.nptel.iitm.ac.in/video.php?subjectId=106102064
3. www-old.oberon.ethz.ch/WirthPubl/AD.Pdf
4. http://www.roseindia.net/tutorial/datastructure

**C) Major Equipment/ Instrument with Broad Specifications**

| Sr.No. | Equipment | Specification |
|---|---|---|
| 1 | Desktop Computer | PC Specifications to be followed:<br>Processor: i3 or i5<br>RAM: 4 GB or better<br>HDD: 1 TB SATA<br>Monitor: TFT LCD<br>OS: Genuine Windows 8 or 10 Professional or Home Premium or Windows 8 or 10 Ultimate<br>Antivirus: User License for three year |
| 2 | LCD Projector | Display Type: LCD<br>Light Output: 3200 Lumens |
| 3 | Turbo C | Turbo C 3 |
| 4 | C free 5 | C free 5 |

**11.0 MAPPING MATRIX OF PO'S AND CO'S:**

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i | j | k |
| CO1 | H | H | H | M | M | L | | L | M | | |
| CO2 | H | M | H | H | M | | L | L | | | M |
| CO3 | | M | H | H | M | | | L | | M | M |
| CO4 | | H | H | H | M | L | | L | M | | M |
| CO5 | | H | H | | H | L | M | L | | M | |
| CO6 | | H | H | M | | | | | | M | M |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME :** Diploma Programme in Information Technology(IF) / Computer Technology(CM)
**COURSE :** Database Management Systems (DBM) **COURSE CODE :** 6236

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 03 | -- | 04 | 07 | 03 | Max. | 80 | 20 | 100 | 25 | -- | 25 | 150 |
| | | | | | Min. | 32 | -- | 40 | 10 | -- | 10 | -- |

## 1.0 RATIONALE:

The aim of this course is to get broad understanding of the basic concepts of database management systems in particular relational database system. The student will also develop the skills to use Database base package as a backend for developing database application

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Create databases and maintain relation between the databases.
2. Explain concepts of database system with client server architecture.
3. Design database using normalization rules and the normalize database.
4. Write & execute SQL queries.
5. Apply and Develop concepts of data modelling, security and integrity constraints.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Explain Database concepts, client server architecture and database languages.
2. Draw ER diagram and Design database using Normalization.
3. Design and Maintain Database by using SQL queries.
4. Write PL/SQL Programme, Apply concept of views, trigger and Cursor on database
5. Apply security and Recovery concept on database

**4.0 COURSE DETAILS:**

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Basic Concept of DBMS and Data Models** | 1a. Explain the concept of a data, database and DBMS.<br>1b. Explain the concept of RDBMS.<br>1c. Describe the database languages and overall structure of DBMS.<br>1d. Describe architecture of Client server system | 1.1 Concept of Data, Database, database management System. Disadvantages of file Processing system, advantages of DBMS over file processing system, Application of Database.<br>1.2 What is RDBMS, Difference between DBMS and RDBMS, name various software of DBMS and RDBMS<br>1.3 Data abstraction, Database languages, Instance and schema, Data independence – Logical and Physical Independence<br>1.4 Components of DBMS and overall Structure of DBMS. Database Users, functions of Database Administrator.<br>1.5 Introduction to client server architecture. Two/Three tier Architecture. | 08 |
| **Unit-II**<br><br>**Relational Data Model and Database Security and Integrity Constraint** | 2a. Explain Relational and Key concept.<br>2b. Implement and Draw an ER diagram<br>2c. Explain various data constraint and need of data security<br>2d. Describe various database constraint | 2.1 Relational Model: - Basic Concepts Attributes and Domains. Key Concepts: - Candidate key, Primary key, Foreign key and Super key.<br>2.2 E-R model, Components of ER Model, Types of attributes, Role indicator, weak & strong entity set.<br>2.3 Database Security: introduction, Data security requirements.<br>2.4 Integrity Constraints: Domain Integrity Constraints, Entity Integrity Constraints, Referential Integrity Constraints & on delete Cascade<br>2.5 Relational Algebra and Relational Calculus. | 12 |
| **Unit-III**<br><br>**SQL and PL-SQL** | 3a. Write SQL queries to create relational database and apply data constraint<br>3b. Write SQL queries for data manipulation<br>3c. Implement the Queries using various operators and functions<br>3d. Design the Queries for controlling in Database<br>3e. State the features and components of the PL/SQL | 3.1 Introduction to SQL<br>3.2 Data Types in SQL<br>3.3 DDL Commands: CREATE, ALTER, DROP, TRUNCATE, DESC, RENAME, Truncate, Creating a User, Use of data Constraints<br>3.4 DML Commands: INSERT, UPDATE, DELETE, CALL<br>3.5 SQL Operators: Arithmetic Operators, Comparison Operators, Logical Operators, Set Operators, Range Searching operators-Between, Pattern matching operators-Like.<br>3.6 String functions and Date time functions<br>3.7 Queries using Group by, having and | 12 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | 3f. Write simple PL/SQ Code using control structure and handle various exceptions.<br>3g. Create stored procedures and implement functions and create database trigger using PL/SQL | Order by clause, Joins, Types of Joins, Sub queries.<br>3.8 DCL Commands: COMMIT, SAVEPOINT, ROLLBACK, GRANT, REVOKE.<br>3.9 PL/SQL Introduction, PL/SQL block structure, variables, SQL statements in PL/SQL, PL/SQL control Structures, Cursors, Triggers, Functions, Packages, procedures.<br>3.10 Error handling in PL/ SQL | |
| **Unit-IV**<br><br>**Relational Database Design, Storage and File structure** | 4a. Describe the process of Normalization & Design database Structure using various Normal forms to reduce redundancy.<br>4b. Explain the concept of file organization, organization of records in files and Indexing and Hashing | 4.1 Purpose of Normalization, Data redundancy and updating anomalies, Functional Dependencies and Decomposition,<br>4.2 Process of Normalization using 1NF, 2NF, 3NF, multivalued dependencies and BCNF.<br>4.3 File Organization, Organization of records in files, Storage of Object Oriented databases,<br>4.4 Basic concept of Indexing and Hashing. | 10 |
| **Unit-V**<br><br>**Query Processing and Transaction Processing** | 5a. Explain general strategies for query processing, Equivalence Expression and relations in the response<br>5b. Explain the concept of transaction and its ACID properties | 5.1 Query Processing<br>5.2 General Strategies for query processing<br>5.3 Equivalence expressions<br>5.4 Relations in the response<br>5.5 Concept of transaction, ACID Properties of transaction, States of transactions | 06 |
| **TOTAL** | | | **48** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

| Unit No. | Unit Title | Distribution of Theory Marks | | | |
|---|---|---|---|---|---|
| | | R Level | U Level | A and above Levels | Total Marks |
| I | Basic Concept of DBMS and Data Models | 08 | 06 | 06 | 20 |
| II | Relational Data Model and Database Security and Integrity Constraint | 08 | 04 | 04 | 16 |
| III | SQL and PL-SQL | 06 | 04 | 08 | 18 |
| IV | Relational Database Design, Storage and File structure | 08 | 04 | 04 | 16 |
| V | Query Processing and Transaction Processing | 04 | 04 | 02 | 10 |
| | **TOTAL** | **34** | **22** | **24** | **80** |

**Legends:** R = Remembrance (Knowledge); U= Understanding; A= Application and above levels (Revised Bloom's taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers.

The actual distribution of marks in the question paper may vary slightly from above table.

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

***Note**: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

| S. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. Required |
|---|---|---|---|
| 1 | I | Study and use of DBMS related software | 02 |
| 2 | II | Draw E. R. Diagrams for at least 8 different examples. (College management system, Banking system, Car Rental Co operation, hospital management system and so on) | 06 |
| 3 | III | Creation of table along with primary key and foreign key | 06 |
| 4 | III | Creating & Executing DDL and DML commands in SQL. | 06 |
| 5 | III | Executing Queries using the Select Command with Where, Having, Group by and order by clauses also execute the queries using aggregate functions. | 06 |
| 6 | III | Execute the queries for implementation of Inner, Outer and Cross Join. | 06 |
| 7 | III | Executing DCL commands in SQL. | 06 |
| 8 | III | Write the basic PL/SQL Programs and also Write a PL/SQL programs using if then else, for, while and nested loop. | 06 |
| 9 | III | Write a PL/SQL code to implement implicit and explicit cursors. | 06 |
| 10 | III | Write PL/SQL code for creating Procedures, functions and database triggers | 06 |
| 11 | IV | Demonstration of normalizations concept. | 04 |
| 12 | V | Study of Query processing and Transaction Procession | 04 |
| | | **TOTAL** | **64** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Develop a MINIPROJECT for management system
   a. Library management system
   b. College management
2. Draw an E-R Diagrams for database.
3. Organized random file data in tabular forms.
4. Study security and recovery of various database software's
5. Study transaction concurrency of various database software's

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Prepare database like student information, banking, library, insurance etc.
2. Arrange a visit to data entry and processing organization
3. Arrange expert seminar of industry person in the area of database management.

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Database system concept | Korth and Silberschatz | McGraw Hill |
| 2 | An introduction to database system | Bipin Desai | Galgotia Publications |
| 3 | An introduction to Database | C. J. Date | Pearson |
| 4 | Sql/Pl-SQL | Ivan Bayross | BPB |

### B) Software/Learning Websites

1. http://www.wiziq.com/tutorial/130692-dbms
2. http://www.nptel.iitm.ac.in/video.php?subjectId=106106093
3. http://www.getahead-direct.com/gw-er-diagram-tutorial.htm
4. http://msdn.microsoft.com/en-us/library/ms130214.Aspx
5. WWW.W3Schools.com

### C) Major Equipment/ Instrument with Broad Specifications

| Sr.No. | Equipment | Specification |
|---|---|---|
| 1 | Desktop Computer | PC Specifications to be followed:<br>Processor: i3 or i5<br>RAM: 4 GB or better<br>HDD: 1 TB SATA<br>Monitor: TFT LCD<br>OS: Genuine Windows 8 or 10 Professional or Home Premium or Windows 8 or 10 Ultimate<br>Antivirus: User License for three year |
| 2 | LCD Projector | Display Type: LCD<br>Light Output: 3200 Lumens |
| 3 | MS Sql Server | MS Sql Server 2008 or 2012 or higher |
| 4 | Oracle | Oracle 10 G 11G or Higher |
| 5 | MySql | MySQL Community Server 5.5 or higher |
| 6 | Ms-Access | Mc Access 2007 or Higher |

## 10.0 MAPPING MATRIX OF PO'S AND CO'S:

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i | j | k |
| CO1 | H | H | H | H | M | L | | L | M | | |
| CO2 | H | M | H | H | M | | M | L | | | M |
| CO3 | | M | H | M | M | | | L | | M | M |
| CO4 | | H | M | M | M | L | | L | M | | M |
| CO5 | | H | H | M | M | L | M | L | | M | |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME :** Diploma Programme in Information Technology(IF) / Computer Technology(CM)
**COURSE :** Programming in C (PIC) **COURSE CODE :** 6237

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 03 | -- | 04 | 07 | 03 | Max. | 80 | 20 | 100 | 25 | -- | 25 | 150 |
| | | | | | Min. | 32 | -- | 40 | 10 | -- | 10 | -- |

## 1.0 RATIONALE:

'C' is the most widely used computer language, which is being taught as a core course. C is general-purpose structural language that is powerful, efficient and compact, which combines features of high-level language and low-level language. It is closer to Man and Machine both. Due to this inherent flexibility and tolerance it is suitable for different development environments. Due to these powerful features C has not lost its importance and popularity in recently developed and advanced software industry. C can also be used for system level programming, C is still considered as first priority programming language.

This course will act as "programming concept developer" for students. It will also act as "Backbone "for courses like OOPS, VB, Windows Programming, JAVA, OOMD etc.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Develop logical skills to solve the basic computing problems
2. Learn the syntax and usage of C programming constructs.
3. Develop programs using different looping and branching statements.
4. Develop programs based on arrays and strings handling functions.
5. Use user-defined functions, structures and union.
6. Understand the concept of pointer in C Programming.
7. Develop programs using file handling.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Explain basic terminology used in C programming
2. Write, compile and debug program in C language.
3. Use basic element like control statements, array and strings
4. Design program by using decision structure, loops, functions and pointers.
5. Explain the basic concept of file handling.

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I** | 1a. Introduction and history of C | 1.1 Importance of integrated development environment(Turbo C) | 08 |
| **Basics of C** | 1b. Basics structure of "c" | 1.2 History of C<br>1.3 Basics of Algorithm and Flowchart in C, Steps for executing a C program<br>1.4 Character set, Trigraph Character tokens, constants, variables, keywords C operators, C expressions, data types in c, keywords, c operators | |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | | 1.5 Formatted input, formatted output<br>1.6 Structure of C program, Rules for writing a C program | |
| **Unit-II**<br><br>**Flow Control Statements** | 2a. Decision making and branching statements.<br>2b. Decision making and looping statements. | 2.1 if statement (if, if-else, else-if ladder, nested if-else)<br>2.2 Switch case statement, continue, break statement.<br>2.3 while, do, do-while, loop and for loop statements<br>2.4 for loop, continue statement | 12 |
| **Unit-III**<br><br>**Arrays And Strings** | 3a. Introduction of array<br>3b. Introduction of string and use of string library functions | 3.1 One dimensional, two Dimensional and character arrays, accessing array elements.<br>3.2 String handling functions from standard library (strlen (), strcpy(), strcat(), strcmp()). | 08 |
| **Unit-IV**<br><br>**Functions and Program Structure** | 4a. Introduction of Functions<br>4b. Implement the function call by value and call reference.<br>4c. Introduction to structure. | 4.1 Need of functions, scope and lifetime of variables, defining Functions.<br>4.2 function call (call by value, call by reference), return Values, storage classes, category of function( No argument No return value, No argument with return value, argument with return value), recursion<br>4.3 Structures, Defining structure, declaring and accessing structure, Members, initialization of structure, arrays of structure. | 08 |
| **Unit-V**<br><br>**Pointers** | 5a. Explain Basic Concepts of Pointers.<br>5b. Implement concept of pointers by call by value and call by reference | 5.1 Introduction, Understanding pointers, declaring and accessing Pointers, Pointers arithmetic, pointers and arrays.<br>5.2 concept of call by value & call by reference using pointers. | 08 |
| **Unit-VI**<br><br>**File Handling** | 6a. To learn basic file handling operations | 6.1 File operations –opening, reading, writing & closing file | 04 |
| | | **TOTAL** | **48** |

**5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):**

| Unit No. | Unit Title | Distribution of Theory Marks | | | |
|---|---|---|---|---|---|
| | | R Level | U Level | A and above Levels | Total Marks |
| I | Basics of C | 04 | 04 | 04 | 12 |
| II | Flow Control Statements | 05 | 10 | 05 | 20 |
| III | Arrays And Strings | 04 | 04 | 04 | 12 |
| IV | Functions and Program Structure | 05 | 06 | 05 | 16 |
| V | Pointers | 04 | 04 | 04 | 12 |
| VI | File Handling | 02 | 04 | 02 | 08 |
| | **TOTAL** | **24** | **32** | **24** | **80** |

**Legends:** R = Remembrance (Knowledge); U= Understanding; A= Application and above levels (Revised Bloom's taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

***Note**: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

| S. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. required |
|---|---|---|---|
| 1 | I | To Write an algorithm and flowchart in 'C' with sample example | 04 |
| 2 | I | Program which implement the formatted input and output statements in 'C' with sample example. | 04 |
| 3 | I | Program which contain various operators in 'C' with sample example. | 04 |
| 4 | II | Program for decision control statements (if, if-else, nested if-else with sample example for each type. | 06 |
| 5 | II | Program for decision control statement switch control statement in 'C'. | 06 |
| 6 | II | Program for Loop control statements in 'C'. | 06 |
| 7 | III | Program for single dimensional integer arrays in 'C'. | 04 |
| 8 | III | Program for multiple dimensional integer arrays in 'C'. | 04 |
| 9 | III | Program for string functions in 'C', by developing algorithm, flowchart & writing program for string comparison, copying and concatenation | 04 |
| 10 | IV | Program for functions in 'C' by developing algorithm, flowchart & writing program for finding factorial of a given no. | 06 |
| 11 | IV | Program to write the structure in 'C'. | 04 |
| 12 | V | Program to pointers in 'C', by developing algorithm, flowchart & writing program to print values of variables and their addresses and call by reference. | 04 |
| 13 | V | Program for array of pointers in 'C'. | 04 |
| 14 | VI | Program for basic file operations in c | 04 |
| | | **TOTAL** | **64** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Prepare Mini project which include all the content of course
2. Programming in "c".

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

Demo lectures with power point presentations using LCD projector should be arranged to develop programming concepts of students.

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Programming in 'C' | E. Balgurusamy | Tata McGraw Hill |
| 2 | Let us 'C' | Yashavant Kanetkar | BPB |
| 3 | Complete reference C | Herbert Shildt | Tata McGraw Hill |
| 4 | The C Programming Language | Brian Kernighan and Dennis Ritchie | Paperback |

### B) Software/Learning Websites

1. http://www.iu.hio.no/~mark/CTutorial/CTutorial.html
2. http://apex.vtc.com/c-programming.php
3. http://www.eskimo.com/~scs/cclass/cclass.html
4. http://www.cprogramming.com/tutorial/c/lesson1.html

### C) Major Equipment/ Instrument with Broad Specifications

1. Hardware-Desktop, Computer P-IV processor.
2. Software-Turbo C-Editor

## 10.0 MAPPING MATRIX OF PO'S AND CO'S:

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i | j | k |
| CO1 | L | M | H | M | L | | M | | | | L |
| CO2 | M | H | H | H | L | | L | | | | L |
| CO3 | L | H | M | L | | L | L | | | L | L |
| CO4 | M | H | H | L | | | | L | L | L | L |
| CO5 | L | H | | | L | | | | | | L |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME :** Diploma Programme in Information Technology(IF) / Computer Technology(CM)
**COURSE :** Object Oriented Programming (OOP) **COURSE CODE :** 6238

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 03 | -- | 04 | 07 | 03 | Max. | 80 | 20 | 100 | 50 | -- | 25 | 175 |
| | | | | | Min. | 32 | -- | 40 | 20 | -- | 10 | -- |

## 1.0 RATIONALE:

Object oriented programming has become the preferred approach for most software projects. Object oriented programming offers a new and powerful way to cope with complexity. Object oriented programming concepts are useful for constructing complex physical systems such as car, airplanes etc. Instead of viewing the program as a series of steps to be carried out, it views as a group of objects that have certain properties and can take appropriate actions. Among the Object oriented programming languages available C++ is most widely used language. Different programs based on Inheritance, polymorphism, encapsulation, overriding requires knowledge of C++. This course acts as a base for languages JAVA, VC++ & UML.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Write programs using objects & classes.
2. Develop programs to create and destroy the objects
3. Use existing operators for different meanings.
4. Using reusability concept.
5. Implement pointers for arrays, strings & object.
6. Describe polymorphism, virtual function & write program for same.
7. Apply formatted & unformatted console I/O operation & perform file related activities by using C++ streams.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Acquire the knowledge in the principal of object oriented languages.
2. Recognize the problem modeling approach with modularity using functions.
3. Develop the program by using object oriented techniques.
4. Develop the code reusability using the concept of inheritance and polymorphism.
5. Know the basics of File Operations.
6. Write the object oriented programs with template, complicated exception handling facilities and formatted/unformatted console.

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Principle of Object Oriented Programming** | 1a. History & features of c++ | 1.1 Basic concepts of object--oriented programming, Benefits of OOPs,<br>1.2 Object oriented languages, Application of OOPs, difference between oops and procedure oriented<br>1.3 Expressions and control structures | 04 |
| **Unit-II** | 2a. Concept of Classes and | 2.1 Specifying a class, Defining | 06 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Classes and Objects** | object | member functions, Private member function<br>2.2 Arrays within a class<br>2.3 Creating objects, memory allocation for objects,<br>2.4 Static data & member function,<br>2.5 Arrays of objects, objects as function argument | |
| **Unit-III**<br><br>**Functions in C++** | 3a. Introduction to functions<br>3b. Concept of Function overloading<br>3c. Concept of friend and virtual function | 3.1 Function Prototyping<br>3.2 Call by Value, Call by reference, Return by Reference<br>3.3 Inline function,<br>3.4 Default and constants arguments,<br>3.5 Function overloading<br>3.6 Friend and virtual functions,<br>3.7 Math library functions | 06 |
| **Unit-IV**<br><br>**Constructors and Destructors** | 4a. Concept of Constructor<br>4b. Introduction to destructor | 4.1 Concept of Constructor (Default, Parameterized, copy),<br>4.2 Overloaded Constructors,<br>4.3 Constructor with default argument<br>4.4 Destructors. | 04 |
| **Unit-V**<br><br>**Inheritance: Extending Classes** | 5a. Introduction to inheritance and types of inheritance | 5.1 Concepts of inheritance<br>5.2 Derived classes<br>5.3 Member declaration (Protected)<br>5.4 Types of inheritance (Single, multilevel, multiple, hierarchical, Hybrid inheritance),<br>5.5 Visibility Modes-- Private, Public and Protected<br>5.6 Virtual base classes, Abstract classes,<br>5.7 Constructors in derived Classes, Member classes. | 08 |
| **Unit-VI**<br><br>**Polymorphism** | 6a. Introduction to polymorphism and Types of Polymorphism<br>6b. Implement function overloading<br>6c. Implement operator overloading | 6.1 Concept of polymorphism<br>6.2 Types of polymorphism - Compile time, Run time polymorphism<br>6.3 Function Overloading<br>6.4 Operator overloading (overloading unary & binary operators)<br>6.5 rules for overloading operators | 06 |
| **Unit-VII**<br><br>**Pointers and Virtual Functions** | 7a. Introduction to Pointers<br>7b. Concept of Virtual function | 7.1 Pointers to objects<br>7.2 this pointers<br>7.3 Pointer to derived class,<br>7.4 virtual function, pure virtual functions<br>7.5 static and dynamic binding | 06 |
| **Unit-VIII**<br><br>**I/O and file Processing.** | 8a. Introduction to c++ stream and classes<br>8b. Implement file operations<br>8c. Introduction to | 8.1 C++ Stream, Stream Classes,<br>8.2 Formatting and manipulating I/O<br>8.3 file operations(open, close, read, write)<br>8.4 file pointer and manipulation and | 08 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | Template<br>8d. Concept and implementation of Exception handling | commend line arguments,<br>8.5 Templates<br>8.6 Class Templates<br>8.7 Member function templates.<br>8.8 Exception handling and its mechanism- throwing and catching. | |
| | | **TOTAL** | **48** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

| Unit No. | Unit Title | Distribution of Theory Marks | | | |
|---|---|---|---|---|---|
| | | **R Level** | **U Level** | **A Level** | **Total Marks** |
| I | Principle of Object Oriented Programming | 02 | 02 | 02 | 06 |
| II | Classes and Objects | 02 | 05 | 03 | 10 |
| III | Functions in C++ | 03 | 04 | 03 | 10 |
| IV | Constructors and Destructors | 02 | 03 | 03 | 08 |
| V | Inheritance: Extending Classes | 04 | 04 | 04 | 12 |
| VI | Polymorphism | 04 | 04 | 04 | 12 |
| VII | Pointers and Virtual Functions | 03 | 04 | 03 | 10 |
| VIII | I/O and file **Processing.** | 04 | 04 | 04 | 12 |
| | **TOTAL** | **24** | **30** | **26** | **80** |

**Legends:** R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

***Note****: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of* ***Programme Outcomes/Course Outcomes in affective domain*** *as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

| Sr. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. required |
|---|---|---|---|
| 1 | I, II | Programs to input & output data (Simple programs). | 04 |
| 2 | II | Programs to create object of class. | 04 |
| 3 | II | Programs to create arrays of objects. | 04 |
| 4 | II | Program to access static member variables. | 04 |
| 5 | III | Programs using object as function arguments to friend function. | 04 |
| 6 | IV | Programs to define Class using constructor & destructor. (Default constructor, Multiple constructor, Parameterized constructor) | 06 |
| 7 | V | Program using Types of inheritance & virtual base class. | 06 |
| 8 | VI | Program to overload unary & binary operator. | 04 |
| 9 | VI | Program to implement function overloading. | 06 |

| Sr. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. required |
|---|---|---|---|
| 10 | VII | Program for (virtual functions) runtime polymorphism. | 06 |
| 11 | VII | Program for this pointer. | 06 |
| 12 | VIII | Program for file processing | 06 |
| 13 | VIII | Program on templates. | 04 |
| | | **TOTAL** | **64** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Prepare a mini project by using Object Oriented Programming concepts.

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Demo lectures with power point presentations using LCD projector should be arranged to develop

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Object oriented programming with C++ | Balgurusamy | Tata McGraw Hill |
| 2 | Object oriented programming in Turbo C++ | Lafort Robert | Galgotia Publications Pvt. Ltd. |
| 3 | The C++ Programming Language | Bjarne Stroustrup, | Pearson publications. |

### B) Software/Learning Websites

1. www.cplusplus.com/doc/tutorial/
2. http://atomicobject.com/resources/handbook-of-software/introduction-objective-c
3. www.cprogramming.com/begin.html
4. www.cpp4u.com/c++/tutorial/c++_tutorials.html

### C) Major Equipment/ Instrument with Broad Specifications

1. Hardware: Desktop Computer P-IV processor or higher
2. Software: Turbo C-Editor

## 10.0 MAPPING MATRIX OF PO'S AND CO'S:

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i | j | k |
| CO1 | M | H | H | L | | | L | | | | L |
| CO2 | | H | M | | L | | L | | | | M |
| CO3 | | H | M | L | | | L | | | | M |
| CO4 | | H | M | | L | L | | | | | M |
| CO5 | | H | M | | | | | | | | M |
| CO6 | | H | M | | L | | L | | | | M |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME :** Diploma Programme in Information Technology(IF) / Computer Technology(CM)
**COURSE :** PC Architecture and Maintenance (PCM) **COURSE CODE :** 6239

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 03 | -- | 02 | 05 | 03 | Max. | 80 | 20 | 100 | -- | 25 | 25 | 150 |
| | | | | | Min. | 32 | -- | 40 | -- | 10 | 10 | -- |

## 1.0 RATIONALE:

The basic intention of this course is to introduce functionality and working of each component of computer system such as motherboard, processor, storage devices, I/O devices and other peripherals. Students will be able to select different components of computer system as per given specifications. It will help students to identify and troubleshoot different problems of peripherals of computer system.

Main intention of this course is to develop a troubleshooting skill of students regarding computer peripherals. This course will help our students to assemble computer system, install device drivers and software.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Install, configure operating system and Device drivers
2. Install, configure and maintain various components in computer system and peripheral devices.
3. Diagnose faults, repair and maintain computer system and its peripheral
4. Assemble the computer system

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Draw the various components of motherboard
2. Analyze the recording techniques and working of storage devices
3. Draw the construction and working of display devices like CRT, LCD
4. Explain the construction and working of Input/output Devices.
5. Explain the working of SMPS and power problems
6. Explain the ports of PC and interfacing technique of devices to ports

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Motherboard & Its Component** | 1a. Introduction to CPU and its features<br>1b. Draw Chipset Architecture of PIV<br>1c. Introduction to Different types of Processor<br>1d. Explain different Buses on motherboards of Pentium PIV<br>1e. Explain cache memory<br>1f. Describe features and | 1.1 Concept of address lines, data lines, internal registers, CPU slot<br>1.2 North / South Bridge architecture and Hub architecture<br>1.3 Core2Duo, i3, i5, i7 processors<br>1.4 Overview and features of ISA, PCI-X, PCI-X press, AGP, PCMCIA, AGP, Processor BUS (no pin description) PCI versus PCI Express<br>1.5 Internal cache, External cache (L1, 1 L2, L3 cache)<br>1.6 DDR1, DDR2, DDR3. | 10 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | types of SDRAM<br>1g. Identify different functions of BIOS. | 1.7 BIOS & CMOS Set Up | |
| **Unit-II**<br><br>**Storage Devices & Interfacing** | 2a. Explain Recording Technique Of HDD<br>2b. Explain working of Hard disk<br>2c. Explain working of USB Drive<br>2d. Explain working of CDROM and DVD drive | 2.1 FM, MFM, recording techniques.<br>2.2 Hard disk: construction and working<br>2.3 Track, Sector cylinder, cluster, landing zone, MBR, Zone recording, write precompensation<br>2.4 FAT basics: Low level formatting, High level formatting, partitioning<br>2.5 Introduction to file system FAT 16, FAT 32, NTFS<br>2.6 CDROM: Construction, Recording<br>2.7 DVD: Construction, Recording | 08 |
| **Unit-III**<br><br>**Display Devices & Interfacing** | 3a. Draw and describe block diagram of CRT color monitor<br>3b. Write down Characteristics of CRT monitor<br>3c. Introduction to LCD monitor and its working principles<br>3d. Explain video accelerator card | 3.1 Block diagram Of CRT and function of each block<br>3.2 Dot pitch, Resolution, Video bandwidth, Horizontal scanning frequency, vertical scanning frequency, Interlaced versus non interlaced monitor<br>3.3 Advantages of CRT display related to LCD display<br>3.4 Functional block diagram of LCD monitor, working principal, advantages and disadvantages Types: Passive matrix and Active matrix<br>3.5 Basic block diagram of a video accelerator card | 05 |
| **Unit-IV**<br><br>**Input and Output Devices** | 4a. Explain Keyboard types<br>4b. Describe different types of Mouse<br>4c. Explain types of Scanner<br>4d. Compare internal and external Modem<br>4e. Identify different types of Printers and their characteristics | 4.1 Keyboard and their types<br>4.2 Opto-mechanical, optical ( New design)<br>4.3 Flat-Bed, Sheet-fed, Hand-held: Block diagram of flat Bed and specifications<br>4.4 Internal and External Modem: Block diagram and specifications<br>4.5 Printer Characteristics, Inkjet, Laser, Thermal<br>4.6 Block diagram of inkjet and laser printer. | 08 |
| **Unit-V**<br><br>**Power Supplies** | 5a. Draw block diagram of SMPS<br>5b. Define Power supply and factors<br>5c. Describe different types of Power problem<br>5d. Draw block diagram of Uninterrupted Power | 5.1 Block diagram and working of SMPS<br>5.2 Poser supply form factor: AT, ATX<br>5.3 Rated wattage, Efficiency, Regulation, Ripple, Load regulation, Line regulation<br>5.4 Blackout, Brownout, surges and spikes.<br>5.5 Surge suppressor. | 04 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | Supply(UPS) | 5.6 Online and Offline UPS, working of UPS: Block diagram, advantages and disadvantages, | |
| **Unit-VI**<br><br>**Interfaces** | 6a. Describe different types of cables and connectors<br>6b. Identify different USB features.<br>6c. Explain RS 232 signal<br>6d. Introduction to Fire wire and Bluetooth | 6.1 SCSI, SCSI cables and connectors, SCSI drive configuration<br>6.2 USB Features<br>6.3 RS232(Voltages and signal description)<br>6.4 Firewire features<br>6.5 Introduction to Bluetooth | 05 |
| **Unit-VII**<br><br>**PC Troubleshooting Maintenance and Tools** | 7a. Explain POST in detail<br>7b. Explain Preventive maintenance of PC<br>7c. Draw and describe different type of Diagnostic Tools | 7.1 POST sequence, Beep codes<br>7.2 Active, Passive, periodic maintenance<br>7.3 Preventive maintenance of peripherals of PCs, logic Analyzer, logic probe.<br>7.4 Norton utilities, QAPlus, PC Tools | 08 |
| | | **TOTAL** | **48** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

| Unit No. | Unit Title | Distribution of Theory Marks | | | |
|---|---|---|---|---|---|
| | | R Level | U Level | A and above Levels | Total Marks |
| I | Motherboard & Its Component | 05 | 05 | 04 | 14 |
| II | Storage Devices & Interfacing | 04 | 06 | 04 | 14 |
| III | Display Devices & Interfacing | 02 | 04 | 04 | 10 |
| IV | Input and Output Devices | 04 | 05 | 05 | 14 |
| V | Power Supplies | 02 | 04 | 04 | 10 |
| VI | Interfaces | 02 | 04 | 02 | 08 |
| VII | PC Troubleshooting & Maintenance and Tools. | 04 | 04 | 02 | 10 |
| | **TOTAL** | **23** | **32** | **25** | **80** |

**Legends:** R = Remembrance (Knowledge); U= Understanding; A= Application and above levels (Revised Bloom's taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

***Note****: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of* ***Programme Outcomes/Course Outcomes in affective domain*** *as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

| S. No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. required |
|---|---|---|

| S. No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. required |
|---|---|---|
| 1 | Drawing the motherboard layout of Pentium IV and studying the chipset through data books or Internet. | 02 |
| 2 | CMOS setup of Pentium. | 02 |
| 3 | Hard Disk Partitioning. | 04 |
| 4 | Formatting the Partitions Using File Systems | 04 |
| 5 | Installation of OS (Windows, Linux). | 04 |
| 6 | Details of HDD: Identify various components of HDD and write their functions | 04 |
| 7 | Install and understand the working of printer. | 04 |
| 8 | Installation of Scanner and Modems | 04 |
| 9 | Fault findings:<br>(a) Problems related to monitor.<br>(b) Problems related to CPU. | 04 |
| | **TOTAL** | **32** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Visit to industry and collect data about PC and Hardware
2. Collect information about all hardware of PC and other resources
3. PC Assembling

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Show Computer hardware parts
2. Arrange visit to hardware industry
3. Arrange expert seminar of industry person in the hardware area.

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Managing & Troubleshooting PCs | Mike Meyers, Scott Jernigan | Tata McGraw Hill |
| 2 | Bigelow's Troubleshooting, Maintaining & Repairing PCs | Bigelow | Tata McGraw Hill |
| 3 | The Complete PC Upgrade & Maintenance Guide | Mark Minasi | BPB Publication |
| 4 | Computer Installation & Servicing | D. Balasubramanian | Tata McGraw Hill |
| 5 | Upgrading & Repairing PCs | Scott Muller | Techmedia |

### B) Software/Learning Websites

1. http://www.karbosguide.com/
2. http://www.karbosguide.com/books/pcarchitecture/start.Htm
3. http://en.wikipedia.org/wiki/Computer_hardware

### C) Major Equipment/ Instrument with Broad Specifications

| Sr.No. | Equipment | | Specification |
|---|---|---|---|
| 1 | Hardware: | Desktop Computer | Processor: intel core i5, Memory: at least 4GB RAM Hard drive: at least 320GB hard disk |
| 2 | | LCD Projector | Display Type: LCD, Light Output: 3200 Lumens |
| 3 | Software: | Windows | **Windows 7, 10 or Higher** |
| 4 | | Linux | Linux |
| 5 | | Drivers | Drivers for Desktop Computers |

**10.0 MAPPING MATRIX OF PO'S AND CO'S:**

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **a** | **b** | **c** | **d** | **e** | **f** | **g** | **h** | **i** | **j** | **k** |
| CO1 | H | | | H | | | | M | | | |
| CO2 | | H | | | M | L | | | | L | |
| CO3 | H | | | | | | M | M | | | |
| CO4 | | M | H | | L | | | | | | L |
| CO5 | | | H | | | M | | | L | | |
| CO6 | L | L | | | H | | | | | M | |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME** : Diploma Programme in Information Technology(IF) / Computer Technology(CM)
**COURSE** : Web Page Designing (WPD) **COURSE CODE** : 6241

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 01 | -- | 04 | 05 | -- | Max. | -- | -- | -- | 50 | -- | 50 | 100 |
| | | | | | Min. | -- | -- | -- | 20 | -- | 20 | -- |

## 1.0 RATIONALE:

As recent year saw rapid growth of internet, so it is essential for Computer /IT students to get familiar with Web technologies that are use for developing both web based educational and business applications. These technologies are required for developing applications of various domains. So it is significant that the students of diploma develop capability to use Hyper Text Markup Language (HTML) technologies for developing professional static web environment.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Interpret the web platform, Building blocks of web site and preliminary concepts of web.
2. Describe the Basic structure, tags of HTML
3. Design the static web pages using tables, frames, images. As well should be able to accept user input using HTML forms
4. Design web pages with different types of CSS
5. Use and Apply HTML 5 and CSS 3 tags for Web page design as well use XML to store data

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Explain the Difference between Static and Dynamic Web Pages.
2. Design web pages using Different types of HTML Tags.
3. Design web pages with tables, frames, images as well as HTML forms.
4. Development of a website using Cascading Style Sheet
5. Identify, use and Design HTML5 and CSS 3 tags for designing advanced web pages and use of XML documents for storing data.

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Introduction to Web** | 1a. Terminologies<br>1b. Basic Structure of Web Page<br>1c. Introduction to Web Server and Web Browsers<br>1d. Type of Web Pages | 1.1 Web, Web Site, WebPage, Web Server, Web Browser, Search Engine<br>1.2 Basic tags of HTML Page Structure like DOCTYPE, HTML, HEAD, TITLE, BODY tags<br>1.3 Web Server, Need of Web Server, User, Client, Role of Client, Communication between user and client<br>1.4 Static Web Pages, Dynamic Web Pages | 04 |
| **Unit-II**<br><br>**HTML Programming** | 2a. Components of HTML<br>2b. Basic Formatting Tags<br>2c. Lists<br>2d. Linking web pages<br>2e. Color and Backgrounds | 2.1 Tags, Open tag, close tag, attribute and end tag<br>2.2 Text Level Tags: and Block level tags, Adding comments in HTML<br>2.3 Ordered, Unordered and Nested List Definition Lists | 03 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | | 2.4 URL: Types of URLs, Absolute URLs, Relative URLs Internal and External, Anchor Tag.<br>2.5 Text Color, Background Color, Link color, Font color | |
| **Unit-III**<br><br>**Advanced HTML** | 3a. Forms<br>3b. Table<br>3c. Frames<br>3d. Images | 3.1 Form tag, action and method attribute. SELECT and OPTION tags Select Tag Submit, Reset, button<br>3.2 Table, TR, TD, TH tags, border, cell spacing, cell padding, width, align, bgcolor attributes, Caption Tag & is attributes, Spanning multiple rows and column<br>3.3 Concept of Frames, Frame tags and it's attribute, Frameset tags and it's attribute, Use of NOFRAMES tag, Frame targeting, concept of iframes<br>3.4 IMG tag and different Image formats, colors and backgrounds | 03 |
| **Unit-IV**<br><br>**Dynamic HTML** | 4a. Dynamic HTML<br>4b. Types of style sheets<br>4c. Selectors<br>4d. Style sheet properties | 4.1 Introduce Style Sheets with different types.<br>4.2 Adding style to the document: Linking to style sheets, Embedding style sheets, Setting margin, width, border width, color, style, padding<br>4.3 CLASS rules, ID rules.<br>4.4 font, text, box, color and background properties | 03 |
| **Unit-V**<br><br>**HTML5, CSS3 and XML** | 5a. Introduction to HTML5 & CSS3<br>5b. HTML5 form<br>5c. Introduction to XML | 5.1 Article, Fig. caption, Footer, Header, Mark Section Tags, CSS3: 2D &3D Transform<br>5.2 Color, Date, Datetime, Datetime-Local, Email, Month, Number, Range, Search, Tel, Time, Url, Week<br>5.3 Introduction To XML, HTML And XML Comparison, Document Type Definition, Components Of XML, Uses Of XML | 03 |
| **TOTAL** | | | **16** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Not Applicable

**Legends:** R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

***Note**: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

| S. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. required |
|---|---|---|---|
| 1 | I | Design Web page and apply some block level tags and some text level tags | 06 |
| 2 | II | Design Web page and include different lists. | 06 |
| 3 | II | Include various links in a Web page& set background color and document with text colour. | 06 |
| 4 | II | Design a web page with background image, different text colour for different paragraphs and set colours for links, active links and visited links. | 08 |
| 5 | III | Create HTML table, format contents in table cells and span the rows and columns. | 06 |
| 6 | III | Create basic frameset and format the frames within the frameset using different attributes. Also use frame targeting. | 08 |
| 7 | IV | Create a basic form using different input controls. | 06 |
| 8 | V | Create a web page and apply style sheet properties (font, text and box properties) with class and ID. | 06 |
| 9 | V | Design a web page to implement concept of CSS3 2D Transforms and CSS3 3D Transforms. | 06 |
| 10 | V | Create a XML file for storing basic information of student | 06 |
| **TOTAL** | | | **64** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Visit various static and dynamic web sites and understand the difference.
2. Understand and observe the structure of Web sites with Mozilla web browser tools like developer->inspect
3. Sketch the structure of web site on paper with each details

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Study any real time web site
2. Identify various aspects of Web development by analyzing various sites online.
3. Prepare a website using various templates available.

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | HTML and XHTML – The complete reference | Thomas Powell | Tata McGraw Hill, New Delhi. |
| 2 | HTML and Web Design – Tips and Techniques | Jamsa, King anderson | Tata McGraw Hill, New Delhi. |

### B) Software/Learning Websites

1. http://www.w3schools.com/html/
2. http://www.html.net/

**C) Major Equipment/ Instrument with Broad Specifications**

Not Applicable

**10.0 MAPPING MATRIX OF PO'S AND CO'S:**

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **a** | **b** | **c** | **d** | **e** | **f** | **g** | **h** | **i** | **j** | **k** |
| CO1 | H | H | M | | M | | M | M | M | | L |
| CO2 | | H | M | M | M | | | | | | L |
| CO3 | | M | M | M | M | | | | | | L |
| CO4 | | M | | M | | | M | | | | |
| CO5 | | M | M | M | M | | | | | | |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME :** Diploma Programme in Information Technology(IF) / Computer Technology(CM)
**COURSE :** Operating System (OPS) **COURSE CODE :** 6242

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Total Credits | TH Paper Hrs. | Marks | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 03 | -- | 02 | 05 | 03 | Max. | 80 | 20 | 100 | -- | -- | 25 | 125 |
| | | | | | Min. | 32 | -- | 40 | -- | -- | 10 | |

## 1.0 RATIONALE:

Operating system is the interface between the user and the computer system. It is the first piece of software to run on a computer system when it is booted. Its job is to co--ordinate and provide services for the execution of application software. This is core technology course and the knowledge of which is absolutely essential for Computer Engineers. It familiarizes the students with the concepts and functions of operating system. This course provides knowledge to develop systems using advanced operating system concepts.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Explore the various milestones in the history of Operating Systems and various generations of computers as well as the modern trends in Operating Systems
2. Provide a comprehensive introduction to understand the underline principles, techniques and approaches which constitute a coherent body of knowledge in operating system.
3. Outline the features and functions of operating systems provided by various system calls.
4. Differentiate various memory management and file management techniques.
5. Formulate the tools and the components of the operating system.
6. Design various algorithms for job scheduling.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Classify different types of operating Systems.
2. Identify services and functions of Operating Systems and explain the use system calls.
3. Implement a program for various process scheduling algorithms and evaluate problems based on scheduling algorithm.
4. Identify deadlock situation and apply preventive and corrective mechanism for handling deadlock.
5. Differentiate various Memory allocation methods and file accessing.

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Introduction** | 1a. Distinguish between various generations of computer.<br>1b. Verify different components of operating system.<br>1c. State services & functions of Operating Systems. | 1.1 Operating System: Batch operating system, Multi Programmed, Multitasking, Time Shared OS. Multiprocessor Systems, Distributed Systems, Cluster Systems, Real time systems.<br>1.2 Components of Operating systems: process management, main memory management, file management, system | 08 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | 1d. Explore system calls, types and uses.<br>1e. Distinguish between different kernel architecture | management.<br>1.3 Operating System Services<br>1.4 User-Operating System Interface<br>1.5 Virtual Machines<br>1.6 System Calls- Concept, Types and Uses<br>1.7 Simple Structure, Layered, Monolithic, Microkernel. | |
| **Unit-II**<br><br>**Processes Management & Thread overview.** | 2a. Outline Process, process scheduling, schedulers.<br>2b. Interpreter inter-process communication and synchronization.<br>2c. Formulate critical section problem and solution to ensure the consistency of shared data<br>2d. Evaluate thread, multithreading models. | 2.1 Process: Concept, process states, Process Control Block.<br>• Process Scheduling: Scheduling Queues, Schedulers, Context switch.<br>2.2 Inter-process communication: Introduction, shared memory system and message passing system, critical section problem, semaphores.<br>2.3 Threads: Benefits, users and kernel threads.<br>• Multithreading Models: Many to One, One to One, Many to Many. | 10 |
| **Unit-III**<br><br>**CPU scheduling and Process Synchronization** | 3a. Evaluate CPU scheduling, various CPU-scheduling algorithms.<br>3b. Solve problems based on scheduling algorithms.<br>3c. Explore process Synchronization | 3.1 Scheduling and its types: Objectives, concept, CPU and I/O burst cycles, Pre-emptive, Non- Pre-emptive Scheduling, Scheduling criteria.<br>3.2 Types of Scheduling algorithms: First come first served (FCFS), Shortest Job First (SJF), Shortest Remaining Time(SRTN), Round Robin (RR) Priority scheduling, multilevel queue scheduling<br>3.3 Process Synchronization :critical section problem,<br>• Semaphores and monitors. | 12 |
| **Unit-IV**<br><br>**Deadlock** | 4a. Identify Deadlock conditions and apply deadlock prevention algorithm.<br>4b. formulate deadlock recovery | 4.1 Deadlock - System Models, Necessary Conditions leading to Deadlocks<br>4.2 Deadlock Handling - Preventions, avoidance, Banker's algorithm<br>4.3 Deadlock recovery. | 08 |
| **Unit-V**<br><br>**File management and Memory Management** | 5a. Distinguish between memory allocation methods<br>5b. Describe virtual memory: segmentation, paging.<br>5c. Evaluate files, file attributes and file structure. | 5.1 Basic Memory Management - Partitioning, Fixed and Variable. Free Space management Techniques: Bitmap, Linked List.<br>5.2 Virtual Memory: Concept, Segmentation, Paging, Page table, Page fault.<br>5.3 File: Concepts, Attributes Operations, Types and File System Structure<br>5.4 Access Methods: Sequential, Direct, Swapping, File Allocation Methods- Contiguous, Linked, Indexed. | 10 |
| **TOTAL** | | | **48** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

| Unit No. | Unit Title | Distribution of Theory Marks | | | |
|---|---|---|---|---|---|
| | | R Level | U Level | A and above Levels | Total Marks |
| I | Introduction | 04 | 04 | 04 | 12 |
| II | Processes Management & Thread overview. | 04 | 04 | 08 | 16 |
| III | CPU scheduling and Process Synchronization | 04 | 08 | 04 | 16 |
| IV | Deadlock | 04 | 04 | 08 | 16 |
| V | File management and Memory Management | 04 | 08 | 08 | 20 |
| | **TOTAL** | **20** | **28** | **32** | **80** |

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

***Note**: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

| S. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Hours |
|---|---|---|---|
| 1 | I | Write programs using the following system calls of UNIX operating system: Fork, exec, getpid, exit, wait, close, stat, opendir, readdir | 04 |
| 2 | III | Write a C Program for First Come First Serve Scheduling Algorithm. | 02 |
| 3 | III | Write a C Program for Shortest Job first Scheduling Algorithm. | 02 |
| 4 | III | Write a C Program for Shortest Remaining time first Scheduling Algorithm. | 02 |
| 5 | III | Write a C Program for Round Robin Scheduling Algorithm | 02 |
| 6 | III | Write a C Program for reader's writers problem. | 04 |
| 7 | III | Write a C Program for Dining Philosophers problem. | 04 |
| 8 | III | Given the list of processes, their CPU burst times and arrival times, Write a c program display/print the Gantt chart for Priority and Round robin For each of the scheduling policies, compute and print the average waiting time and average turnaround time. (2 sessions). | 04 |
| 9 | III | Implement the Producer – Consumer problem using semaphores (using system calls). | 04 |
| 10 | IV | Implement Bankers Algorithm. | 04 |
| **TOTAL** | | | **32** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Study the different operating system with its utilities.
2. Installation of different operating system.
3. Study the different PC configuration required for particular operating system.
4. Study the different CPU scheduling algorithms and write a C programme for algorithms.

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Arrange expert seminar on latest launches operating system in year.
2. Draw and stick tabular representation charts of configuration required for different operating system in laboratory.

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1. | Operating system concepts | Silberschatz Galvin | John Wiley and Sons |
| 2. | Operating System | Achyut S. Godbole | Tata McGraw Hill |
| 3. | Operating System | William Stallings | Pearson |

### B) Learning Websites

1. http://163. 30. 150. 88/qualify/OS/os7_soltutions. PDF
2. www.tutorialspoint.com/operating_system
3. www.lynda.com/../252-0.html
4. www.os-templates.com/free -web-site-templates/educational

### C) Major Equipment/ Instrument with Broad Specifications

| Sr.No. | Equipment | Specification |
|---|---|---|
| 1 | Desktop Computer | PC Specifications to be followed:<br>Processor: i3 or i5<br>RAM: 4 GB or better<br>HDD: 1 TB SATA<br>Monitor: TFT LCD<br>OS: Genuine Windows 8 or 10 Professional or Home Premium or Windows 8 or 10 Ultimate<br>Antivirus: User License for three year |
| 2 | LCD Projector | Display Type: LCD<br>Light Output: 3200 Lumens |
| 3 | Microsoft Windows 7 | 1 gigahertz (GHz) or faster 32-bit (x86) or 64-bit (x64) processor*<br>1 gigabyte (GB) RAM (32-bit) or 2 GB RAM (64-bit)<br>16 GB available hard disk space (32-bit) or 20 GB (64-bit)<br>DirectX 9 graphics device with WDDM 1.0 or higher driver |
| 4 | Windows 8 | Processor: 1 gigahertz (GHz)* or faster with support for PAE, NX and SSE2 (more info)<br>RAM: 1 gigabyte (GB) (32-bit) or 2 GB (64-bit)<br>Hard disk space: 16 GB (32-bit) or 20 GB (64-bit)<br>Graphics card: Microsoft DirectX 9 graphics device with WDDM driver. |
| 5 | Ubuntu | 700 MHz processor (about Intel Celeron or better)<br>512 MiB RAM (system memory)<br>GB of hard-drive space (or USB stick, memory card or external drive but see LiveCD for an alternative approach)<br>VGA capable of 1024x768 screen resolution.<br>Either a CD/DVD drive or a USB port for the installer media |

**10.0 MAPPING MATRIX OF PO'S AND CO'S:**

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **a** | **b** | **c** | **d** | **e** | **f** | **g** | **h** | **i** | **j** | **k** |
| CO1 | H | | M | L | | | | | M | L | M |
| CO2 | M | L | H | | M | | | M | L | L | M |
| CO3 | L | M | H | H | H | H | | H | M | L | M |
| CO4 | | M | H | H | M | H | M | L | M | L | M |
| CO5 | | | M | | H | H | H | M | M | L | M |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME** : Diploma Programme in Computer Technology(CM)
**COURSE** : Computer Network (CPN) **COURSE CODE** : 6243

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 03 | -- | 02 | 05 | 03 | Max. | 80 | 20 | 100 | -- | 25 | 25 | 150 |
| | | | | | Min. | 32 | -- | 40 | -- | 10 | 10 | -- |

## 1.0 RATIONALE:

Today is age of Computer Technology. In many applications, we send information from one place to another place. So networking of computer is very essential. The many business applications like Railway reservation, Industrial sale, purchase, Industrial automation, on line Banking, E-business, E-Commerce and many applications. All this applications and many other Require knowledge of computer network.

Computer network organize information from hundreds of offices spread over wide geo--graphical area and output remote information at a push of button. This gives type of network. Two or more computer interconnected through via copper wire, fiber optics and microwave, infrared and satellite i. e. wire and wireless communication.

Here we set basic concept of networking, its applications, topologies, communication media and network directing devices, protocol used, OSI reference model and TCP/IP model.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Identifying the various types of networks.
2. Describe different types of Topology and Network devices.
3. Compare different transmission media.
4. Compare OSI and TCP/IP model.
5. Configure TCP/IP protocols.
6. Well known to Network Security.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Distinguish the types of networks and its services
2. Identify the network devices and topologies
3. Categorized various wired and wireless media
4. Configured LAN using TCP/IP protocol
5. Secured the network as well as data by applying various network policies

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Basic Network Concepts** | 1a. Distinguish between various types of Networks<br>1b. Write down the benefits of computer network.<br>1c. Classifying Networks by their Geography | 1.1 Concept of Network -- Human Networks; Computer Networks; Network Plan.<br>1.2 Benefits of Network -- Sharing Information; Sharing Resources; Facilitating Centralized Management – Managing Software, Maintaining the Network, Backing Up Data.<br>1.3 Network classifications --Classifying | 08 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | | Networks by their Geography – LAN, MAN, WAN; Classifying Networks by their Component Role -- Peer to Peer, Server based Network.<br>1.4 Network Services -- File Sharing; Printer Sharing; Application Services; E—Mail; Remote Access. | |
| **Unit-II**<br><br>**Network Topologies & Devices** | 2a. Classifying Network topologies with their use<br>2b. Distinguish between different Network devices | 2.1 Network Topologies -- Bus Topology; Ring Topology; Star Topology; Mesh Topology; Tree Topology; Hybrid Topology.<br>2.2 Network Control Devices --Hubs; Switches; Routers; Bridges; Repeaters; Gateways; Modems. | 08 |
| **Unit-III**<br><br>**Transmission Media** | 3a. Describe transmission media.<br>3b. Explain types of wired media<br>3c. Describe types of wireless media and cellular telephone<br>3d. Distinguish between wired and wireless media | 3.1 Network Topologies -- Bus Topology; Ring Topology; Star Topology; Mesh Topology; Tree Topology; Hybrid Topology.<br>3.2 Network Control Devices --Hubs; Switches; Routers; Bridges; Repeaters; Gateways; Modems. | 08 |
| **Unit-IV**<br><br>**OSI Network Reference Model** | 4a. Describe OSI Model and its layers<br>4b. Describe TCP/IP Reference Model.<br>4c. Comparison of the OSI and TCP/IP reference models. | 4.1 OSI Reference Model -- Interlayer Communication – Data Encapsulation, Horizontal Communication, Vertical Communication, Encapsulation Terminology; Physical layer; Data link layer; Network layer; Transport layer; Session layer; Presentation layer; Application layer.<br>4.2 TCP/IP Reference Model – Link; Internet; Transport; Application layer.<br>4.3 Comparison of the OSI and TCP/IP reference models. | 08 |
| **Unit-V**<br><br>**TCP/IP Protocol** | 5a. Recognize TCP/IP protocols<br>5b. Distinguish between TCP and UDP<br>5c. Describe P address classes ,sub netting and registered and unregistered address<br>5d. Configured LAN using TCP/IP protocol. | 5.1 TCP/IP Protocols -- SLIP and PPP; ARP, RARP; IP; ICMP, IGMP; TCP and UDP.<br>5.2 IP Addressing -- IP Address Assignments; IP Address Classes; Subnet Masking; Registered and unregistered Addresses; Introduction to IPV6, Comparison of IPV4 & IPV6.<br>5.3 TCP/IP Configuration -- Installing the TCP/IP Protocol; Configuring TCP/IP -- Configuring Basic TCP/IP Properties, Configuring Advanced TCP/IP Properties | 08 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-VI**<br><br>**Network Security** | 6a. Describe the internal network security<br>6b. Describe External security<br>6c. Explain network backup and restore | 6.1 Internal Security-- Account Security, File & Directory Permission<br>6.2 External Security-- Front Door Threats, Back Door Threats, Viruses & other malicious software's,<br>6.3 Offsite Storage.<br>6.4 Firewall Concept<br>6.5 Network Backup & Restore**--** Accessing needs, Acquiring backups media & technology, choosing backup strategies | 08 |
| | | **TOTAL** | **48** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

| Unit No. | Unit Title | Distribution of Theory Marks | | | |
|---|---|---|---|---|---|
| | | R Level | U Level | A and above Levels | Total Marks |
| I | Basic Network Concepts | 04 | 04 | 04 | 12 |
| II | Network Topologies & Devices | 04 | 04 | 02 | 10 |
| III | Transmission Media | 08 | 08 | 04 | 18 |
| IV | OSI Network Reference Model: | 02 | 04 | 08 | 14 |
| V | TCP/IP Protocol | 04 | 08 | 04 | 16 |
| VI | NetworkSecurity | 02 | 04 | 04 | 10 |
| | **TOTAL** | **22** | **32** | **26** | **80** |

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

**Note**: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.

| Sr. No. | Unit No | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. required |
|---|---|---|---|
| 1 | I | To observe Components of Network in your Computer Network Lab. Draw layout of Lab | 04 |
| 2 | I | Creating User Account & Applying Account policies on standalone computer. | 02 |
| 3 | I | Use step by step procedure for i. e. File sharing & Printer sharing. | 04 |
| 4 | III | Connecting RJ45 connector to the cable using crimping and prepare a Straight and Cross over Cable and test by Line Tester. | 04 |
| 5 | II | Connect Computers in Star Topology using Wired Media and any Network control Device. | 04 |
| 6 | I,II,III | Create a Network using peer to peer network model. | 04 |
| 7 | V | Implementation of network commands. (ipconfig, tracert, ping, telnet etc.) | 02 |

| Sr. No. | Unit No | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. required |
|---|---|---|---|
| 8 | V | Installation of TCP/IP Protocol. | 04 |
| 9 | V | Implementing a TCP/IP Network configuration | 02 |
| 10 | VI | Implementing Network Security. | 02 |
| **TOTAL** | | | **32** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Survey the various college/industry/institute and identify the type of network implemented
2. Survey the various college/industry/institute and identify the type of network topology implemented
3. Prepare charts on course.
4. Collect information regarding latest wireless technology.
5. Survey the various college/industry/institute and identify the type of network devices used
6. Survey the various college/industry/institute and identify the type of TCP/IP configuration installed

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

2. Industry Visit
3. Expert Lectures

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Richard A. McMohan, Sir | Introduction to Networking | Tata McGraw--Hill Edition |
| 2 | Microsoft Press | Networking + Certification (Second Edition) | Microsoft Press |
| 3 | Craig Zacker | Complete Reference Networking | Tata McGraw--Hill Edition |
| 4 | Achyut S. Godbole | Data Communication and Networking | Tata McGraw--Hill Edition |
| 5 | Andrew S. Tanenbaum, David J. Wetherall | Computer Networks | Pearson Education |
| 6 | Behrouz Forouzan | TCP/IP Protocol Suite | McGraw-Hill |

### B) Periodicals:

1) Computer Magazine, 2) Computer Today, 3) PC Quest

### C) Software/Learning Websites

1. http://authors.phptr.com/tanenbaumcn4/
2. http://en.wikipedia.org/wiki/Computer_network
3. http://www.e-tutes.com/lesson1/networking_fundamentals_lesson1_1.htm
4. http://www.networktutorials.info/

**D) Major Equipment/ Instrument with Broad Specifications**

| Sr.No. | Equipments | Specifications |
|---|---|---|
| 1 | LAN cables | Cat 5/6 |
| 2 | RJ-45 cables | 11 Pins |
| 3 | Crimping tool | Crimping tool |
| 4 | LAN Tester | LAN Tester |
| 5 | Computer | HDD: 40GB Processor: PIV or above<br>Min RAM: 2GB or above, OS: 32 bit or 64 bit |
| 6 | Router | Wired/wireless |
| 7 | Switch | -16/24 ports |

**10.0 MAPPING MATRIX OF PO'S AND CO'S:**

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i | j | k |
| CO1 | H | | | | M | H | | | M | | M |
| CO2 | H | M | | | | H | L | | | | |
| CO3 | | M | | | M | | | L | | | M |
| CO4 | H | | M | | M | | | | M | | |
| CO5 | H | M | | M | | H | | M | | M | M |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME** : Diploma Programme CE / ME / PS / EE / IF / CM / EL / AE
**COURSE** : Applied Mathematics (AMT) **COURSE CODE** : 6301

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 03 | -- | -- | 03 | 03 | Max. | 80 # | 20 | 100 | -- | -- | -- | 100 |
| | | | | | Min. | 32 | -- | 40 | -- | -- | -- | -- |

# indicates online examination

**1.0 RATIONALE:**

The study of mathematics is necessary to develop in the students the skills essential for new technological development. This course introduces some applications of engineering, through which the students can understand mathematics with engineering principles.

**2.0 COURSE OBJECTIVES:**

The student will be able to,

1. Acquire knowledge of mathematical terms, concepts, principles and different methods.
2. Develop ability to apply mathematical method to solve engineering problems.
3. Acquire sufficient mathematical technique necessary for practical problems.
4. Apply the relation between mathematics and applications in engineering.

**3.0 COURSE OUTCOMES:**

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to solve engineering and applied mathematical problems using

1. Methods of integration
2. Definite integral and its application
3. Differential equation and its application
4. Numerical methods for solving algebraic and simultaneous equations
5. Laplace's transform.
6. Probability distribution.

**4.0 COURSE DETAILS:**

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Integration** | 1a. Solve integration problem using rules and formulae<br>1b. Apply method of integration for solving problem | 1.1 Definition of integration, integral as anti- derivative, integration of standard functions.<br>1.2 Rules of integration (Integral of sum or difference of functions, scalar multiplication)<br>1.3 Methods of integration.<br>a. Integration by method of substitution & by using trigonometric transformation<br>b. Integration of rational functions & by method of partial fraction<br>c. Integration by parts | 12 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-II**<br><br>**Definite Integration And Its Application** | 2a. Apply definite integration to solve engineering problems, area Volume, R.M.S. value. | 2.1 Definite Integration<br>a. Definition of definite integral<br>b. Properties of definite integral with simple problems<br>c. Application of definite integration Area under curve, area bounded by two curves. Volume generated by revolution of curve, RMS value & mean value. | 08 |
| **Unit-III**<br><br>**Differential Equations** | 3a. To form and solve Differential Equation<br>3b. Apply various method to solve differential equations<br>3c. Solve engineering problems using differential equation. | 3.1 Definition of differential equation, order and degree of differential equation. Formation of differential equation for function containing single or double constants.<br>3.2 Solution of differential equations of first order and first degree such as<br>a. Variable separable form<br>b. Reducible to variable separable<br>c. Homogeneous differential equation<br>d. Linear differential equation<br>e. Bernoulli's differential equation.<br>3.3 Applications of differential equations. | 08 |
| **Unit-IV**<br><br>**Numerical Methods** | 4a. Solve algebraic equations by using Bisection method and Newton Raphson Method<br>4b. Solve simultaneous Equations by using Gauss-Seidel method and Jacobi's method<br>4c. Apply Lagrange's interpolation formula and Newton forward interpolation formula | 4.1 Solution of algebraic equations using iterative method<br>a. Bisection method<br>b. Newton-Raphson method.<br>4.2 Solution of simultaneous equations containing three unknowns – iterative methods<br>a. Gauss-Seidel method<br>b. Jacobi's method<br>4.3 Interpolation<br>a. Lagrange's interpolation formula<br>b. Newton's forward difference<br>4.4 Interpolation formula | 08 |
| **Unit-V**<br><br>**Laplace transform** | 5a. Acquire knowledge of Laplace transform and Inverse Laplace transform.<br>5b. Apply Laplace Transform to solve Differential Equations. | 5.1 Definition of Laplace transform and standard formulae of Laplace transform<br>5.2 Properties of Laplace transform (linearity, first & second shifting, multiplication by $t^n$, division by t )<br>5.3 Inverse Laplace transform, using partial fraction<br>5.4 Laplace transform of derivatives<br>5.5 Application of Laplace transform for solving differential equation. | 06 |
| **Unit-VI**<br><br>**Probability Distribution** | 6a. Apply Binomial Distribution<br>6b. Apply Poisson's Distribution<br>6c. Apply Normal Distribution | 6.1 Binomial distribution<br>6.2 Poisson's distribution<br>6.3 Normal distribution (simple examples) | 06 |
| | | **TOTAL** | **48** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

| Unit No. | Unit Title | Distribution of Theory Marks | | | |
|---|---|---|---|---|---|
| | | R Level | U Level | A and above Levels | Total Marks |
| I | Integration | 04 | 08 | 08 | 20 |
| II | Definite Integration and its application | 04 | 04 | 04 | 12 |
| III | Differential Equations | 04 | 08 | 04 | 16 |
| IV | Numerical Methods | 04 | 04 | 08 | 16 |
| V | Laplace Transform | 02 | 04 | 02 | 08 |
| VI | Probability distribution. | 02 | 04 | 02 | 08 |
| | **TOTAL** | **20** | **32** | **28** | **80** |

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

Unit wise home assignment, containing ten problems.

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Teacher guided self learning activities.
2. Applications to solve identified Engineering problems and use of Internet.
3. Learn graphical software: Excel, DPlot, Graph etc.

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

Not Applicable

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Mathematics for polytechnic student (III) | S. P. Deshpande | Pune Vidyarthi Gruha |
| 2 | Applied Mathematics | Kumbhojkar | Phadake Prakashan |
| 3 | Numerical Methods | S. S. Sastry | Prentice Hall Of India |
| 4 | Text book of Applied Mathematics, Volume I&II | P. N. Wartikar, J. N. Wartikar | Pune Vidyarthi Gruha Pune |

### B) Software/Learning Websites

1. http://www.mathsisfun.com/calculus/integration-definite.html
2. http://www.intmath.com/applications-integration/applications-integrals-intro.php
3. http://www.maths.surrey.ac.uk/explore/vithyaspages/differential.html
4. http://tutorial.math.lamar.edu/Classes/DE/LaplaceIntro.aspx
5. http://library2.lincoln.ac.nz/documents/Normal-Binomial-Poisson.pdf

### C) Major Equipment/ Instrument with Broad Specifications

1. Scientific Calculator
2. Computer system with Printer, Internet system.
3. LCD Projector.

**10.0 MAPPING MATRIX OF PO'S AND CO'S:**

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **a** | **b** | **c** | **d** | **e** | **f** | **g** | **h** | **i** | **j** | **k** |
| CO1 | H | | M | | | | | | | | L |
| CO2 | H | | M | | | | | | | | L |
| CO3 | H | | M | | | | | | | | L |
| CO4 | H | | M | | | | | | | | L |
| CO5 | H | | M | | | | | | | | L |
| CO6 | H | | M | | | | | | | | L |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME** : Diploma Programme in CE / ME / PS / EE / IF / CM / EL / AE / DD / ID
**COURSE** : Environmental Studies (EVS) **COURSE CODE** : 6302

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| -- | -- | 02 | 02 | -- | Max. | -- | -- | -- | -- | -- | 50 | 50 |
| | | | | | Min. | -- | -- | -- | -- | -- | 20 | -- |

## 1.0 RATIONALE:

Environment essentially comprises of our living ambience, which gives us the zest and verve in all our activities. The turn of the twentieth century saw the gradual onset of its degradation by our callous deeds without any concern for the well being of our surrounding we are today facing a grave environmental crisis.

It is therefore necessary to study environmental issues to realize how human activities affect the environment and what could be possible remedies or precautions which need to be taken to protect the environment.

The curriculum covers the aspects about environment such as Environment and Ecology, Environmental impacts on human activities, Water resources and water quality, Mineral resources and mining, forests.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Understand and realize nature of the environment, its components and inter-relationship between man and environment.
2. Understand the relevance and importance of the natural resources in the sustainability of life on earth and living standard.
3. Comprehend the importance of ecosystem and biodiversity.
4. Identify different types of environmental pollution and control measures.
5. Correlate the exploitation and utilization of conventional and non-conventional resources.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Explain uses of resources, their over exploitation and importance for environment
2. Describe major ecosystem
3. Suggest measurers for conservation of biodiversity
4. Identify measures for prevention of environmental pollution
5. Describe methods of water management
6. Identify effects of Climate Change, Global warming, Acid rain and Ozone layer
7. Explain Concept of Carbon Credits
8. State important provisions of acts related to environment

## 4.0 COURSE DETAILS:

There are no separate classes for theory. The relevant theory has to be discussed before the practical during the practical sessions.

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics |
|---|---|---|
| **Unit-I**<br><br>**Importance of Environmental Studies** | 1a. Define the terms related to Environmental Studies<br>1b. State importance of awareness about environment | 1.1 Definition, Scope and Importance of the environmental studies<br>1.2 Need for creating public awareness about environmental issues |
| **Unit-II**<br><br>**Natural Resources** | 2a. Define natural resources<br>2b. Identify uses of natural resources, their overexploitation and importance for environment | 2.1 Uses of natural resources, over exploitation of resources and importance for environment:<br>2.2 Renewable and Non-renewable resources<br>2.3 Forest Resources<br>2.4 Water Resources<br>2.5 Mineral Resource<br>2.6 Food Resources |
| **Unit-III**<br><br>**Ecosystems** | 3a. Define Ecosystem<br>3b. List functions of ecosystem<br>3c. Describe major ecosystem in world | 3.1 Concept of Ecosystem<br>3.2 Structure and functions of ecosystem<br>3.3 Major ecosystems in the world |
| **Unit-IV**<br><br>**Biodiversity and its Conservation** | 4a. Define biodiversity<br>4b. State levels of biodiversity<br>4c. Suggest measurers for conservation of biodiversity | 4.1 Definition of Biodiversity<br>4.2 Levels of biodiversity<br>4.3 Threats to biodiversity<br>4.4 Conservation of biodiversity |
| **Unit-V**<br><br>**Environmental Pollution** | 5a. Classify different types of pollution<br>5b. Enlist sources of pollution<br>5c. State effect of pollution<br>5d. Identify measures for prevention of pollution | 5.1 Definition, Classification, sources, effects and prevention of<br>• Air pollution<br>• Water Pollution<br>• Soil Pollution<br>• Noise Pollution<br>5.2 E- waste management |
| **Unit-VI**<br><br>**Social Issues and Environment** | 6a. Describe methods of water management<br>6b. Identify effects of Climate Change, Global warming, Acid rain and Ozone Layer<br>6c. Explain Concept of Carbon Credits | 6.1 Concept of sustainable development<br>6.2 Water conservation, Watershed management. Rain water harvesting: Definition, Methods and Benefits.<br>6.3 Climate Change, Global warming, Acid rain, Ozone Layer Depletion,<br>6.4 Concept of Carbon Credits and its advantages |
| **Unit-VII**<br><br>**Environmental Protection** | 7a. State important provisions of acts related to environment | 7.1 Importance of the following acts and their provisions:<br>• Environmental Protection Act<br>• Air (Prevention and Control of Pollution) Act<br>• Water (Prevention and Control of Pollution) Act<br>• Wildlife Protection Act<br>• Forest Conservation Act<br>• Population Growth: Aspects, importance and effect on environment<br>• Human Health and Human Rights<br>• ISO 14000 |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Not Applicable

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

***Note**: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

| SR. No. | Unit No. | Practical Exercises | Approx. Hrs. required |
|---|---|---|---|
| 1 | I | Report on Importance and public awareness of Environmental Studies. | 04 |
| 2 | II | Report on Use of natural resources and overexploitation of Resources | 04 |
| 3 | II | Visit /Video Demonstration to Renewable / Non-renewable (wind mill, hydropower station, thermal power station)/ resources of energy. | 04 |
| 4 | II | Visit to polyhouse and writing report on its Effects on agriculture food production. | 04 |
| 5 | III | Assignment/Report on structure and functions of ecosystem. | 04 |
| 6 | IV | Visit to a local area to environmental assets such as river / forest / grassland / hill / mountain and writing report on it. | 04 |
| 7 | V | Group discussion on Environmental Pollution (Air pollution/Water pollution/Soil pollution/Noise pollution/E-waste) | 04 |
| 8 | V | Visit to study recycling of plastic and writing a report on it. | 04 |
| 9 | VI | Visit to Water conservation site / Watershed management site / Rain water harvesting site and writing a report on it. | 04 |
| 10 | VI | Visit to study organic farming/Vermiculture/biogas plant and writing a report on it. | 04 |
| 11 | VI | Video Demonstration /Expert Lecture Report on Climate Change and Global warming | 04 |
| 12 | VII | Write important provisions of Acts related to Environment/ Air (Prevention and Control of Pollution) Act/Water (Prevention and Control of Pollution) Act/ Wildlife Protection Act/ Forest Conservation Act | 04 |
| | | **TOTAL** | **32** |

**Note: Any Four Visits/ Video Demonstration and Four Reports/Assignments from above list to be conducted.**

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Collect articles regarding Global Warming, Climate Change
2. Collect information regarding current techniques, materials etc. in environmental system.
3. Tree plantation and maintenance of trees in the Campus.
4. Cleanliness initiative (Swachhata Abhiayan)

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Course Video
2. Expert Lectures

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Environmental Studies | Erach Bharucha | Universities Press (India) Private Ltd, Hyderabad |
| 2 | Environmental Studies | Dr. Suresh K Dhameja | S K Kataria & Sons New Delhi |
| 3 | Basics of Environmental Studies | U K Khare | Tata McGraw Hill |

### B) Software/Learning Websites

Not Applicable

### C) Major Equipment/ Instrument with Broad Specifications

Not Applicable

## 10.0 MAPPING MATRIX OF PO'S AND CO'S:

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i | j | k |
| CO1 | H | M | | | M | H | | | | | M |
| CO2 | H | M | | | M | H | | | | | M |
| CO3 | H | M | M | | M | H | | | M | | M |
| CO4 | H | M | | M | M | H | | M | | M | M |
| CO5 | H | M | | | M | H | | | | | M |
| CO6 | H | M | | | M | H | M | | | | M |
| CO7 | H | M | | | M | H | | | | | M |
| CO8 | H | M | | | M | H | | | | | M |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME** : Diploma Programme in ME / PS / EE / IF / CM / EL / AE / DD
**COURSE** : Industrial Organization and Management(IOM) **COURSE CODE** : 6303

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 03 | -- | -- | 03 | 03 | Max. | 80 | 20 | 100 | -- | -- | -- | 100 |
| | | | | | Min. | 32 | -- | 40 | -- | -- | -- | -- |

## 1.0 RATIONALE:

Diploma engineer has to work in organization. One must know how organization works, structure of organization, departments & their roles in organization. One should be familiar with concept of organization & its importance in management.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Understand the concepts of organizational growth and differentiation.
2. Resolve the major challenges in the design of an effective organizational structure.
3. Develop critical thinking, research, oral and written communication skills.
4. Promote an understanding to create organizational values and satisfy their stakeholders.
5. Know the preventive measures for accidents and safety.
6. Apply the various tools for scientific management.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Identify the organization and its types with ownerships.
2. State the principals of management with different levels.
3. Describe the types of accidents and its measures.
4. Work as a production supervisor and store officer.
5. Co-ordinate the functions of HRM and Marketing departments.
6. Use the practices of CPM/PERT and Supply Chain Management.

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br>**Organization and Ownerships** | 1a. Describe organization and its types<br>1b. State various types of ownership firms | **a. Organization**<br>1.1 Concept of organization<br>1.2 Types of organization structures as line, line and staff, functional organizational structures, their merits and demerits.<br>**b. Ownerships**<br>1.3 Proprietorship<br>1.4 Partnership, Types of partners, Partnership deed.<br>1.5 Joint stock companies, Private Limited, Public Limited, Joint Ventures.<br>1.6 Govt. departments, Govt. undertaking, Public corporation | 08 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | | 1.7 Cooperative Organizations<br>1.8 Merits & demerits of all above mentioned types of ownership. | |
| **Unit-II**<br><br>**Scientific Management** | 2a. Explain functions of scientific management<br>2b. State the principals of management.<br>2c. Describe different levels of management. | **Scientific Management**<br>2.1 Concept and importance of scientific management.<br>2.2 Principles of Management, Taylor, Fayol's Theories of management.<br>2.3 Functions of Management, Levels of Management and skills at different levels | 06 |
| **Unit-III**<br><br>**Industrial Developments in India and Industrial Acts** | 3a. Explain the major areas of Indian industries<br>3b. Describe types of accidents & safety measures<br>3c. State provisions of industrial acts. | **a. Industrial Developments in India**<br>3.1 Major areas of industry in India (Automobile, Cement, Steel and Agro industries)<br>3.2 Introduction of WTO and GATT<br>**b. Industrial Acts**<br>3.3 Safety Management<br>• Causes of accidents<br>• Types of Industrial Accidents<br>• Preventive measures<br>• Safety procedures<br>3.4 Industrial Legislation - Necessity of Acts, Provisions of following acts:<br>• Indian Factory Act<br>• Workman Compensation Act<br>• ▪ Minimum Wages Act | 08 |
| **Unit-IV**<br><br>**Production and Material Management** | 4a. Explain the types of production systems<br>4b. Describe the material management techniques<br>4c. State use of ERP and MRP | **a. Production Management**<br>4.1 Concept of production management<br>4.2 Types of production systems – job, batch and mass<br>4.3 Merits and demerits of all above production systems<br>**b. Material Management**<br>4.4 Inventory Concept, its classification, functions of inventory<br>4.5 ABC Analysis - Necessity & Steps<br>4.6 Economic Order Quantity Concept, graphical representation, determination of EOQ<br>4.7 Standard steps in Purchasing<br>4.8 Modern Techniques of Material Management- JIT, KANBAN, VSM, LEAN.<br>4.9 Material Resource Planning (MRP) - Functions of MRP, Input to MRP, Benefits of MRP<br>4.10 Enterprise Resource Planning (ERP) - Concept, advantages & disadvantages of ERP | 10 |
| **Unit-V** | 5a. Explain the functions of marketing | **a. Marketing Management**<br>5.1 Concept of marketing management | 08 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Marketing and Human Resource Management** | management<br>5b. Describe selection procedure by HRM dept.<br>5c. Importance of Employee training | and importance<br>5.2 Functions of marketing promotion of sales, market segmentation, marketing mix, 4P's and Physical distribution.<br>**b. Human Resource Management**<br>5.3 Recruitment selection procedure, Functions of HRM Dept.<br>5.4 Training of human resources-objectives, importance and methods of training | |
| **Unit-VI**<br><br>**CPM/PERT and Supply Chain Management** | 6a. Explain the importance of CPM/PERT<br>6b. Describe the need of SCM in industry | **a. CPM/PERT**<br>6.1 CPM & PERT – definitions of node, activity, dummy activity, resources, duration, network, earliest start time, earliest finish time, latest start time, latest finish time, float.<br>6.2 Drawing of network and determination of critical path.<br>6.3 Analysis of network.<br>**b. Supply Chain Management**<br>6.4 Definition and Concept of SCM<br>6.5 SCM practices- Relational, Vendor Managed Inventory (VMI), Agile Manufacturing and Postponement.<br>6.6 Green SCM<br>6.7 Concept of cross docking<br>6.8 Case study of Wall Mart and Dell Computer | 08 |
| | | **TOTAL** | **48** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

| Unit No. | Unit Title | Distribution of Theory Marks | | | |
|---|---|---|---|---|---|
| | | R Level | U Level | A and above Levels | Total Marks |
| I | a. Organization | -- | 04 | -- | 04 |
| | b. Ownerships | 02 | 04 | -- | 06 |
| II | Scientific Management | 04 | 04 | 02 | 08 |
| III | a. Industrial Developments in India | 02 | 04 | -- | 06 |
| | b. Industrial Acts | 04 | 04 | -- | 08 |
| IV | a. Production Management | 02 | 04 | 02 | 08 |
| | b. Material Management | 02 | 04 | 02 | 08 |
| V | a. Marketing Management | -- | 08 | -- | 08 |
| | b. Human Resource Management | 02 | 06 | -- | 08 |
| VI | a. CPM/PERT | 02 | 02 | 04 | 08 |
| | b. Supply Chain Management | 02 | 02 | 04 | 08 |
| | **TOTAL** | **20** | **46** | **14** | **80** |

**Legends:** R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

Not Applicable

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Collect the organization structures of manufacturing, cement, pharmacy, electrical, govt. Sectors.
2. Find out the information of above mentioned industries by internet.
3. Collect the rules of industrial acts by ILO websites.
4. Gather information about chain structures of material management by logistics' industries.
5. Collect the information about WTO and GATT by online resources.

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (IF ANY):

1. Show organization structures of different industries, govt. sectors, private firms etc.
2. Arrange a visit to industries, govt. offices located at nearby areas.
3. Arrange expert seminar/lectures by a resource person from industry in the area of manufacturing, HRM, Logistics etc.

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Industrial Engineering & Management | Dr. O. P. Khanna | Dhanpat Rai & Sons New Delhi |
| 2 | Industrial Engineering & Management | Banga & Sharma | Khanna Publication |
| 3 | Business Administration & Management | Dr. S. C. Saksena | Sahitya Bhavan Agra |
| 4 | The process of Management | W. H. Newman<br>E. Kirby Warren<br>Andrew R. McGill | Prentice- Hall |
| 5 | Entrepreneurship Development & Management | Dr. R. K. Singal | S. K. Kataria & Sons, New Delhi |
| 6 | Production Planning & Control | Dr. R. K. Singal | S. K. Kataria & Sons, New Delhi |

### B) Software/Learning Websites

1. http://www.wto.org/
2. http://www.gatt.org/
3. http://www.worldtradelaw.net/
4. http://www.supplychainbrain.com/
5. http://www.legallyindia.com/

### C) Major Equipment/ Instrument with Broad Specifications

Not Applicable

**10.0 MAPPING MATRIX OF PO'S AND CO'S:**

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **a** | **b** | **c** | **d** | **e** | **f** | **g** | **h** | **i** | **j** | **k** |
| CO1 | | | | M | | | | | | | |
| CO2 | | | | | L | | M | | | | |
| CO3 | | M | | | | | L | | | | |
| CO4 | L | | | | | H | | | | | |
| CO5 | | | | L | | | | | | | L |
| CO6 | | | | | | | M | | | | |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME** : Diploma Programme in CE / ME / PS / EE / IF / CM / EL / AE
**COURSE** : Supervisory Skills (SSL) **COURSE CODE** : 6305

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 03 | -- | -- | 03 | 03 | Max. | 80 | 20 | 100 | -- | -- | -- | 100 |
| | | | | | Min. | 32 | -- | 40 | -- | -- | -- | -- |

## 1.0 RATIONALE:

A diploma engineer working in the industry has to co-ordinate and supervises a group of workers. An engineer should have a leadership attitude. This course will help to develop requisite traits in the diploma engineer.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Understand importance of scientific management.
2. Understand the controlling performance of process & people.
3. Know organizing, staffing and training of worker.
4. Understand the importance of leadership.
5. Know industrial psychology and human relation.
6. Know safety awareness and health administration in the industry.
7. Understand role of supervisor in industry.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Explain the importance of scientific management.
2. Describe controlling performance of process & team of worker.
3. Explain the methods to train the worker.
4. State the qualities of leader.
5. Describe progressive disciplinary action to worker.
6. Enlist causes of accident and prevention of accident.
7. Explain the role of supervisor towards management and worker.

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Scientific Management and Management of Job** | 1a. Define the term management.<br>1b. Differentiate between management, administration and organisation.<br>1c. Explain the necessity and steps of scientific management.<br>1d. Describe handling complexity and its steps. | 1.1 Management-definition, its job, Difference between management, administration and organization. Levels and its functions of management.<br>1.2 Definition, Necessity and, procedure of scientific management<br>1.3 Handling complexity and its steps.<br>1.4 Optimization and its steps. | 06 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-II**<br><br>**Supervisory Management** | 2a. Explain objective of planning by supervisory<br>2b. Describe the different types of budget.<br>2c. Explain the controlling of performance of team of worker in term of quantity & cost. | 2.1 Planning by supervisor, necessity, steps and objectives<br>2.2 Budgeting at supervisory level, objective and its advantages. Types of budget.<br>2.3 Deciding mental & physical activities of workers.<br>2.4 Controlling the performance of process & team of worker in term of quantity / quality/ time/ cost. | 06 |
| **Unit-III**<br><br>**Organising, Staffing and Training.** | 3a. Define organising.<br>3b. State physical resources needed for production.<br>3c. Explain staffing with human resources.<br>3d. Define Merit rating.<br>3e. Explain methods of merit rating.<br>3f. Describe needs & objectives of training.<br>3g. List types of training. Explain any one type | 3.1 Organizing effectively the department, provision of physical resources, matching human need with job need, allotment of to individual and establishing relationship among person working in a group.<br>3.2 Staffing with the human Resources.<br>3.3 Appraisal of Employee performance or merit rating and its types.<br>3.4 Training-definition, needs and objectives its types –induction and orientation, by skill & old worker, on job training, apprentice training, by special schools. | 06 |
| **Unit-IV**<br><br>**Activating the Work Force** | 4a. Define-Motivation.<br>4b. Explain the motivating factors.<br>4c. State qualities of leader.<br>4d. Explain democratic leadership.<br>4e. Explain need of effective communication. | 4.1 Motivation –definition, types and motivating factors.<br>4.2 Leadership-definition, qualities of leader, Role of leadership, methods- authoritarian, democratic and lassez- faire or free rein.<br>4.3 Effective employee communication. | 08 |
| **Unit-V**<br><br>**Managing Problem Performance** | 5a. State symptoms of troubled employee.<br>5b. Explain causes of industrial dispute.<br>5c. Describe collective bargaining.<br>5d. State the causes of substandard performance.<br>5e. Explain progressive disciplinary action. | 5.1 Counseling troubled employees-symptoms, need and guidelines for counseling.<br>5.2 Industrial dispute-causes, strikes, settlement of industrial dispute, collective bargaining, conciliation & mediation and arbitration.<br>5.3 Disciplining-definition, Substandard performance, progressive disciplinary action. | 06 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-VI**<br><br>**Employee Health and Safety under OSHA** | 6a. Define accident.<br>6b. List causes of accident.<br>6c. Explain the effect of accident to industry, worker and society.<br>6d. Describe role of OSHA | 6.1 Accident-definition, Causes of accident, Prevention of accident, effect of accident to industry, worker and society, Preparation of accident report and investigation.<br>6.2 Occupational diseases, hazards, safety awareness.<br>6.3 Role of OSHA. (Occupational safety & health administration), industrial health. | 06 |
| **Unit-VII**<br><br>**Supervisor's Role in Labour Relation.** | 7a. Explain role of supervisor towards management and work.<br>7b. Describe function of labour union. | 7.1 Role of supervisor in management/ worker/fellow Supervisor/work.<br>7.2 Labour or trade union-function, right and liabilities. | 04 |
| **Unit-VIII**<br><br>**Moving up in your Organisation** | 8a. Explain activities to be done at end of shift by supervisor.<br>8b. Describe sort of attitude and action by supervisor while moving up in organization. | 8.1 Taking charge of career to know organization, Department & Worker etc. Planning the day work, activities to be done before shift start, beginning, during and end of shift.<br>8.2 Moving up –sort of attitude and action by supervisor | 06 |
| | | **TOTAL** | **48** |

**5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):**

| Unit No. | Unit Title | Distribution of Theory Marks | | | |
|---|---|---|---|---|---|
| | | R Level | U Level | A and above Levels | Total Marks |
| I | Scientific Management and Management of Job | 04 | 04 | 04 | 12 |
| II | Supervisory Management | 04 | 04 | 04 | 12 |
| III | Organizing, staffing and Training. | 04 | 06 | -- | 10 |
| IV | Activating the work force. | 06 | 04 | -- | 10 |
| V | Managing problem performance. | 04 | 04 | 04 | 12 |
| VI | Employee Health and safety under OSHA | 04 | 02 | 04 | 10 |
| VII | Supervisor's role in Labour Relation. | -- | 06 | - | 06 |
| VIII | Moving up in your organisation. | 04 | 04 | -- | 08 |
| | **TOTAL** | **30** | **34** | **16** | **80** |

**Legends:** R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

Not Applicable

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Prepare safety charts and slogan.
2. Exhibition of safety charts and slogan.

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Show video clips on management and motivation.
2. Arrange expert lecture of industry person in the area of safety awareness in industry.
3. Show video clip on safety in industry.

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Industrial Engineering and management | O. P. Khanna | Dhanpat Rai & Sons |
| 2 | Industrial organization & Engineering Economics | Banga & Sharma | Khanna Publication |
| 3 | Industrial management | Shrinivasan | Dhanpat Rai & Sons |

### B) Software/Learning Websites

1. http://www.management.com
2. www.safety.com

### C) Major Equipment/ Instrument with Broad Specifications

Not Applicable

## 10.0 MAPPING MATRIX OF PO'S AND CO'S:

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i | j | k |
| CO1 | M | | | H | | | | | M | | M |
| CO2 | | | H | M | | | L | M | M | | |
| CO3 | | M | H | M | | | M | | M | | M |
| CO4 | H | | M | | | H | | | M | | M |
| CO5 | | M | | | M | | M | | M | | |
| CO6 | | M | | | M | | M | | M | | M |
| CO7 | | | | M | M | M | M | M | M | | |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME** : Diploma Programme in CE / ME / PS / EE / IF / CM / EL / AE
**COURSE** : Marketing Management (MKM) **COURSE CODE** : 6306

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 03 | -- | -- | 03 | 03 | Max. | 80 | 20 | 100 | -- | -- | -- | 100 |
| | | | | | Min. | 32 | -- | 40 | -- | -- | -- | -- |

## 1.0 RATIONALE:

The Marketing of product is the most important aspect of each industry. It needs to be systematically surveyed and planned as in the increasing competitive situation. An organization should have a profit for its existence. An engineer as entrepreneur, marketing set up of a company should have knowledge of marketing management. The job opportunities for an engineer in the marketing are increasing due to essentiality of person to deal the technical matter and give related feedback for improvement of product marketing function.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Understand various elements of market survey and design its methodology.
2. Understand the duties of marketing personal.
3. Learn the concept of pricing, branding, product mix etc.
4. Understand various marketing strategies.
5. Study various sales Forecasting methods and product diversification.
6. Acquire knowledge of various tools/techniques of Market research and product promotion.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Assess market opportunities by analyzing customers, competitors, collaborators, considering strengths and weaknesses of a company.
2. Develop effective marketing strategies to achieve organizational objectives.
3. Design a strategy implementation program to maximize its chance of success.
4. Assess scope for international marketing.
5. Use various tools/techniques of Market research and product promotion.
6. Apply various innovative ideas of advertisement for enhancing the sales.

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Marketing Management Concept** | 1a. Explain the needs, wants and demands of customers.<br>1b. Describe the concept of marketing management. | 1.1 Needs, wants and Demands, Types of market demands, Products (Goods, services and Ideas), cost and satisfaction. | 10 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | 1c. Explain the functions of marketing management.<br>1d. Differentiate between selling and marketing.<br>1e. Explain the techniques of maximizing, consumption, customer choice and satisfaction.<br>1f. Distinguish between macro and micro environment.<br>1g. Explain techniques of maximizing consumer satisfaction, choice, product life etc. | 1.2 Markets, Marketers and prospects, primary purpose of marketing management.<br>1.3 Simple marketing system, value exchange and transaction, functions of marketing.<br>1.4 The product, production and selling concept.<br>1.5 The marketing concept, difference between marketing and selling, the social marketing concept.<br>1.6 Maximize consumption, satisfaction, choice, product life, quality, customer value and consumer satisfaction, Customer – delight, life time customer.<br>1.7 Marketing environment – value, macro and micro environment. | |
| **Unit-II**<br><br>**Marketing Management Process** | 2a. Explain various types of market segmentation.<br>2b. Explain product life cycle.<br>2c. Describe 4P's of marketing.<br>2d. Explain the significance of different techniques in product promotion.<br>2e. Differentiate between Direct and Indirect marketing. | 2.1 Market segmentation: Basis for segmentation- Geographic / Demographic / psychographic segmentations, benefits of Market segmentation.<br>2.2 Product: Concept of Product, New product development process.<br>2.3 Product Life cycle, Stages in PLC and Marketing Strategies.<br>2.4 Marketing mix: 4 P's, significance of 4P's.<br>2.5 Methods of marketing- Direct and Mass marketing.<br>2.6 Product promotion- Role of advertisement, personnel selling and internet in marketing promotion, mail marketing. | 08 |
| **Unit-III**<br><br>**Price Decisions** | 3a. Explain the significance of pricing in marketing management.<br>3b. Describe the different pricing methodologies. | 3.1 Importance of pricing, price setting in practice<br>3.2 Cost oriented pricing- mark-up pricing, target pricing.<br>3.3 Demand oriented pricing, price discrimination.<br>3.4 Competition oriented pricing- going rate pricing, sealed bid pricing. | 06 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-IV**<br><br>**Marketing Research** | 4a. Explain the concept, scope, objectives, importance and limitation of market research.<br>4b. Explain various methods of data collection.<br>4c. Describe the market research tools and techniques.<br>4d. Differentiate between primary data and secondary data. | 4.1 Market research – Introduction, Nature, Scope, objective, importance, limitations and issue formulation.<br>4.2 Source and collection of marketing data- primary data, secondary data.<br>4.3 Methods of collection of primary data- observation, mail, personal interview, television etc.<br>4.4 Market Research Techniques- National Readership survey, consumer panel, test marketing. | 08 |
| **Unit-V**<br><br>**Advertising and sales management** | 5a. Explain the concepts of marketing communication.<br>5b. Explain the different types of sales promotions.<br>5c. Describe the concepts of sales management.<br>5d. Describe the various types of advertising media. | 5.1 Concept and the process of marketing communication.<br>5.2 Concept of Sales promotion and its types.<br>5.3 Advertising media – objectives and functions, Types of media, advertising budget, functions of advertising agency.<br>5.4 Sales management: Concept, objectives, sales forecasting.<br>5.5 Personnel selling- concept, salesmanship, qualities of salesman. | 08 |
| **Unit-VI**<br><br>**Strategic marketing** | 6a. Describe the concepts of strategic marketing management.<br>6b. Explain the concept of Strategic marketing | 6.1 Objectives and concept of strategic marketing management,<br>6.2 Strategic marketing Analysis-SWOT Analysis, BCG Matrix. | 04 |
| **Unit-VII**<br><br>**International and Export marketing** | 7a. Explain the concept, scope, opportunities and challenges of international marketing.<br>7b. Describe the Multi-National Enterprises with examples.<br>7c. Explain the role of Indian Trade Promotion Organization.<br>7d. State and explain the benefits to exporters. | 7.1 Concept, scope, challenges and opportunities in international marketing.<br>7.2 Foreign market entry strategies.<br>7.3 Concept of Multi-National Enterprises (MNE) with examples.<br>7.4 Institutional support from government to promote export.<br>7.5 Role of I.T.P.O. ( Indian Trade Promotion Organization)<br>7.6 Benefits offered to exporters by Central government. | 04 |
| | | **TOTAL** | **48** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

| Unit No. | Unit Title | Distribution of Theory Marks | | | |
|---|---|---|---|---|---|
| | | R Level | U Level | A and above Levels | Total Marks |
| I | Marketing Management concept | 06 | 08 | -- | 14 |
| II | Marketing Management Process | 04 | 08 | 04 | 16 |
| III | Price Decisions | 04 | 04 | -- | 08 |
| IV | Marketing Research | 04 | 04 | 04 | 12 |
| V | Advertising and sales management | 04 | 08 | 04 | 16 |
| VI | Strategic marketing | 02 | 04 | -- | 06 |
| VII | International marketing – Export | 02 | 02 | 04 | 08 |
| | **TOTAL** | **26** | **38** | **16** | **80** |

**Legends:** R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

Not Applicable

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Group discussion on Brand Strategies of any one company.
2. Assignment / Report writing on:
   (a) Distribution strategy of any one company.
   (b) Promotional tools (communication mix) adopted by any one company.
   (c) Comparative advertising strategies of any two companies.
   (d) Sales promotions offered by FMCG companies/brands (Minimum two companies/brands).

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

Not applicable

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Introduction to Marketing science | Lal G. K. | Pearson edition international |
| 2 | Marketing | Dale Timge | Prentice hall |
| 3 | Marketing Engg. | Lillen Gary | Pearson edition international |
| 4 | Marketing Management | Phillip Kolter | Pearson edition international |
| 5 | Modern Marketing Management | Francis G. K. | S. Chand & Company |
| 6 | Advertising Marketing Sales Management | Thakur D. | D&D Publication |
| 7 | Marketing Management | Mr. S. A. Sherlekar | Everest Publications. |
| 8 | How to Export | NABHI | NABHI Publication |

### B) Software/Learning Websites

1. http://www.business-standard.com/
2. http://studymarketing.org/
3. http://salesandmarketing.com/

**C) Major Equipment/ Instrument with Broad Specifications**

Not Applicable

**10.0 MAPPING MATRIX OF PO'S AND CO'S:**

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **a** | **b** | **c** | **d** | **e** | **f** | **g** | **h** | **i** | **j** | **k** |
| CO1 | | | | L | | | M | H | M | L | |
| CO2 | | | | | H | | | H | H | H | |
| CO3 | | | M | M | M | | M | M | L | | |
| CO4 | | | | | M | | H | L | M | | |
| CO5 | | | | | L | | L | M | M | M | H |
| CO6 | | | L | M | M | M | L | H | H | H | L |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME :** Diploma Programme in CE / ME / PS / EE / IF / CM / EL / AE / DD / ID
**COURSE :** Entrepreneurship Development (EDP) **COURSE CODE :** 6309

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 01 | -- | 02 | 03 | -- | Max. | -- | -- | -- | -- | -- | 50 | 50 |
| | | | | | Min. | -- | -- | -- | -- | -- | 20 | -- |

## 1.0 RATIONALE:

Globalization, liberalization & privatization along with revolution in Information Technology, have thrown up new opportunities that are transforming lives of the masses. On the global scenario we have abundant physical and human resources which emphasizes the importance and need of entrepreneurship. Talented and enterprising personalities are exploring such opportunities & translating opportunities into business ventures such as- BPO, Contract Manufacturing, Trading, Service sectors etc. The student community also needs to explore the emerging opportunities. It is therefore necessary to inculcate the entrepreneurial values during their educational tenure. This will help the younger generation in changing their attitude and take the challenging growth oriented tasks instead of waiting for white- collar jobs. This course will help in developing the awareness and interest in entrepreneurship and create employment for others.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Identify entrepreneurial opportunity.
2. Develop entrepreneurial personality, skills, values and attitude.
3. Analyze business ideas- project selection.
4. Develop awareness about enterprise management.
5. Take help of support systems like banks, Government, DIC etc.
6. Prepare preliminary project report.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Develop Entrepreneurial skill by brainstorming games, SWOT analysis, Risk taking games
2. Collect information by Visiting to DIC and Nationalised Banks
3. Interview of successful entrepreneur
4. Learn the success stories from successful entrepreneur.
5. Select product after market survey for product comparison, specifications and feasibility study
6. Prepare preliminary project report

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Entrepreneurship, Creativity and Opportunities** | 1a. Conduct self analysis<br>1b. Overview of Entrepreneurship<br>1c. Generating business idea | 1.1 Concept, Classification & Characteristics of an Entrepreneur<br>1.2 Creativity and Risk taking.<br>1.3 Concept of Creativity, brainstorming Risk Situation, Types of risk & risk takers. | 04 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | 1d. Search business opportunities | 1.4 Trade Related opportunities<br>1.5 Business Idea -Methods and techniques to generate business idea.<br>1.6 Transforming Ideas in to opportunities<br>1.7 SWOT Analysis<br>1.8 Scanning Business Environment | |
| **Unit-II**<br><br>**Business Terminology, Information and Support Systems** | 2a. Understand Classification of business sectors<br>2b. Acquiring help from support systems<br>2c. Planning of business activities | 2.1 Types of business and industries, forms of ownership, Franchisee, Export, Network/Multilevel Marketing<br>2.2 Sources of Information. Information related to project, support system, procedures and formalities<br>2.3 Support Systems<br>• Small Scale Business Planning, Requirements.<br>• Statutory Requirements and Agencies.<br>• Taxes and Acts | 02 |
| **Unit-III**<br><br>**Market Assessment** | 3a. Conducting Market survey<br>3b. Selection of product | 3.1 Marketing - Concept and Importance<br>3.2 Market Identification, Survey Key components<br>3.3 Market Assessment | 02 |
| **Unit-IV**<br>**Business Finance** | 4a. Understanding terminology of finance<br>4b. Search and analyse sources of finance<br>4c. Financial ratio and profitability study | 4.1 Cost of Project<br>4.2 Sources of Finance<br>4.3 Assessment of working capital<br>4.4 Product costing<br>4.5 Profitability<br>4.6 Break Even Analysis<br>4.7 Financial Ratios and Significance<br>4.8 Various govt. /bank schemes of finance (long term and short term) | 04 |
| **Unit-V**<br><br>**Business Plan and Project Appraisal** | 5a. Prepare a project report<br>5b. Conduct feasibility study | 5.1 Preliminary project report preparation.<br>5.2 Project Appraisal & Selection Techniques<br>• Meaning and definition<br>• Technical, Economic feasibility<br>• Cost benefit Analysis<br>• Checklist | 04 |
| | | **TOTAL** | **16** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Not Applicable

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

***Note**: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

| Sr. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Hours |
|---|---|---|---|
| 1 | I | Entrepreneurship Awareness- Who am I?/ EOI/ Microlab Exercise | 04 |
| 2 | I | Creativity Exercises/games | 02 |
| 3 | I | Risk taking Exercises/games | 02 |
| 4 | II | Brainstorming/group discussion/problem solving exercises | 04 |
| 5 | III | Business Games and Related Exercises | 04 |
| 6 | II | Interview of an entrepreneur | 02 |
| 7 | IV | Event/task/activity management-group of 4-6 students will work together | 04 |
| | | **AND/OR** | |
| 1 to 7 | I-IV | 3 day Achievement Motivation Training workshop /Entrepreneurship Awareness Program | 22 |
| 8 | V | Visit to DIC/Bank/MSSIDC/MIDC/MPCB/Industry | 04 |
| 9 | V | Prepare a preliminary project report and study its feasibility | 06 |
| | | **TOTAL** | **32** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Assess yourself – are you an entrepreneur? (Self Analysis)
2. Report on
   - interview of successful entrepreneurs (minimum two)
   - interaction with the support systems
   - visit to small scale industry
3. Product survey - select one product and collect all its related information i.e. specification, price, manufacturer from at least three suppliers/ manufacturers
4. Prepare list of identified opportunities

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Conduct 3 days awareness camp for entrepreneurship by professional bodies
2. Arrange a visit to SSI/DIC
3. Arrange Interview / Expert lecture of an entrepreneur

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Entrepreneurship Development | E. Gorden<br>K. Natrajan | Himalaya Publishing, Mumbai |
| 2 | Entrepreneurship Development | Colombo plan staff college | Tata McGraw Hill Publishing Co. Ltd. New Delhi. |
| 3 | A Manual on How to Prepare a Project Report | J. B. Patel<br>D. G. Allampally | EDI STUDY MATERIAL Ahmadabad |
| 4 | A Manual on Business Opportunity Identification & Selection | J. B. Patel<br>S. S. Modi | |
| 5 | National Directory of Entrepreneur Motivator & Resource Persons. | S. B. Sareen<br>H. Anil Kumar | |
| 6 | A Handbook of New Entrepreneurs | P. C. Jain | |
| 7 | The Seven Business Crisis & How | V. G. Patel | |

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| | to Beat Them. | | |
| 8 | Entrepreneurship Development of Small Business Enterprises | Poornima M. Charantimath | Pearson Education, New Delhi |
| 9 | Entrepreneurship Development | Vasant Desai | Himalaya Publishing, Mumbai |
| 10 | Entrepreneurship Theory and Practice | J. S. Saini<br>B. S. Rathore | Wheeler Publisher, New Delhi |
| 11 | Entrepreneurship Development | -- | TTTI, Bhopal / Chandigarh |
| 12 | Entrepreneurship Management | Aruna Kaulgad | Vikas Publication |

**B) Software/Learning Websites**

**Websites-**

1. http://www.ediindia.ac.in
2. http://www.dcmsme.gov.in/
3. http://www.udyogaadhaar.gov.in
4. www.smallindustryindia.com
5. www.sidbi.com
6. www.tifac.org.in

**C) Video Cassettes /CDs**

| Sr.No. | SUBJECT | SOURCE |
|---|---|---|
| 1 | Five success Stories of First Generation Entrepreneurs | EDI STUDY MATERIAL<br>Ahmadabad (Near Village Bhat, Via Ahmadabad Airport & Indira Bridge), P.O. Bhat 382428, Gujarat, India P.H. (079) 3969163, 3969153<br>E-mail :<br>ediindia@sancharnet.in<br>olpe@ediindia.org<br>Website : http://www.ediindia.org |
| 2 | Assessing Entrepreneurial Competencies | |
| 3 | Business Opportunity Selection and Guidance | |
| 4 | Planning for completion & Growth | |
| 5 | Problem solving-An Entrepreneur skill | |
| 6 | Chhoo Lenge Aasman | |
| 7 | Creativity | |

**D) Major Equipment/ Instrument with Broad Specifications**

Not applicable

**10.0 MAPPING MATRIX OF PO'S AND CO'S:**

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i | j | k |
| CO1 | | | L | | | | L | M | | | M |
| CO2 | | | | | M | | M | H | M | M | H |
| CO3 | | | | | L | | M | L | H | L | M |
| CO4 | | | | | L | M | M | M | M | H | M |
| CO5 | | | | | H | M | M | H | H | M | M |
| CO6 | L | M | M | M | M | M | H | H | M | H | H |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME** : Diploma Programme in Information Technology(IF) / Computer Technology(CM)
**COURSE** : E-Commerce (ECM) **COURSE CODE** : 6315

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 01 | -- | 02 | 03 | -- | Max. | -- | -- | -- | -- | -- | 50 | 50 |
| | | | | | Min. | -- | -- | -- | -- | -- | 20 | -- |

## 1.0 RATIONALE:

Globalization along with revolution in information technology has thrown up new opportunities that are transforming the lives of masses. Recent years saw a rapid growth of internet in various domains which includes e-commerce primarily. The basic aim of this course is to introduce e-commerce framework with its infrastructure, models, payment systems and e-commerce categories to the students. They should be familiar with the concepts of e-commerce and its importance in running a successful business.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Describe e-commerce and its success factors.
2. Recognize different models of e-commerce and applications of each model.
3. Identify different computing resources required to establish e-commerce infrastructure.
4. Enumerate use of m-commerce in different areas of business.
5. Identify and examine different categories of e-commerce.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Explain basic concepts and framework of e-commerce.
2. Compare different business models of e-commerce.
3. Configure and implement e-commerce infrastructure using different computing resources.
4. Describe online payment systems and applications of m-commerce.
5. Introduce and define scope of different categories of e-commerce.

**4.0 COURSE DETAILS:**

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Introduction to e-Commerce** | 1a. Knowledge about basic concepts of e-commerce environment<br>1b. Introduction to e-commerce framework and its conceptual view<br>1c. Explain different critical success factors of e- commerce | 1.1 Introduction: Internet, WWW, Website, Web Application, Advantages and Disadvantages.<br>1.2 e-Commerce: Definition, History of e-commerce, e-commerce framework, conceptual view, Critical Success Factors: Transaction Security, Reliability, Speed, Brand Awareness, Traffic Volumes, Community, Network Security, Cryptography, Costs etc. | 04 |
| **Unit-II**<br><br>**E-Commerce Business Models and Infrastructure** | 2a. Describe and compare different business models of e-commerce<br>2b. Identify and configure resources to implement e-commerce infrastructure | 2.1 Business model: B2B model, B2C model, C2C model, Advantages and Disadvantages of each model.<br>2.1 E-Commerce Infrastructure: Hardware, Software, Server, Applications, Networking, Data Storage etc. | 04 |
| **Unit-III**<br><br>**Electronic Payment Systems and m-Commerce** | 3a. Describe electronic payment system<br>3b. Uses and applications of m-commerce | 3.1 Electronic Payment System: Credit/Debit Cards, Smart Cards, PayPal, e-Billing, e-Micropayments.<br>3.2 M-Commerce: Overview of mobile-Commerce attributes of m-Commerce, Applications of m-Commerce: Mobile Financial Applications, m- wallet, Mobile Shopping, Advertising. | 04 |
| **Unit-IV**<br><br>**Categories of e-Commerce** | 4a. Introduction to different categories of e-commerce<br>4b. Introduction to online shopping and its scope in India | 4.1 E-Learning: Definition, Introduction, Types of e-Learning.<br>4.2 E-Marketing: Definition, Introduction, Scope, Internet Marketing Techniques.<br>4.3 E-shopping: Introduction, history, advantages and disadvantages, security tips for, online shopping, introduction to big online shopping sites in India. | 04 |
| | | **TOTAL** | **16** |

**5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):**

Not Applicable

**6.0 ASSIGNMENTS/PRACTICALS/TASKS:**

The tutorial/practical/assignment/task should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the desired programme outcome/course outcome.

***Note**: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in the mapping matrix for this course. Faculty should ensure that students also acquire Programme*

*Outcomes/Course Outcomes related to affective domain.*

| S. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. required |
|---|---|---|---|
| 1 | I | Study assignment on e-commerce framework and its conceptual view | 02 |
| 2 | II | Study assignment on different business models of e-commerce and compare each model | 02 |
| 3 | II | Draw and describe different devices required to set up an e-commerce infrastructure (any 5 devices) | 02 |
| 4 | III | Describe each step of online payment process using credit/debit card along with screenshots | 04 |
| 5 | III | Describe each step of online payment process using internet banking along with screenshots | 04 |
| 6 | III | Prepare a simple case study on different payment gateways and third parties of online payment service providers | 04 |
| 7 | III | Describe process of mobile shopping using any one online shopping app along with screenshots | 04 |
| 8 | IV | Study assignment on different types of e-learning methodologies | 02 |
| 9 | IV | Prepare a simple survey of internet marketing techniques used in India | 04 |
| 10 | IV | Describe process of online shopping along with screenshots using any one online shopping site | 04 |
| | | **TOTAL** | **32** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Identify different latest online tools, equipments, websites and mobile apps in a market in concern with E-commerce and prepare a list of it along with its uses.
2. Troubleshooting of hardware and networking devices
3. Perform online payments using credit/debit cards or internet banking
4. Perform a simple survey about online learning web sites in India
5. Visit all available online shopping sites used in India

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Show online shopping to students
2. Show online payment process to students
3. Arrange expert lecture or seminar of industry person in the area of online shopping, marketing, learning and it's challenges

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1. | The E-Commerce Book, 2nd Edition: Building the E-Empire | Stefano Korper, Juanita Ellis | Morgan Kaufmann |
| 2. | The Complete E-Commerce Book: Design, Build & Maintain a Successful Web-based Business | Janice Reynolds | CRC Press |
| 3. | E-Commerce Essentials | Laudon & Traver | Prentice Hall India |
| 4. | E-Commerce Basics: Technology Foundations and E-Business Applications | Davis & Benamati | Prentice Hall India |
| 5. | E-Commerce | Milind Oka | Everest Publishing House |

### B) Software/Learning Websites

1. http://en.wikipedia.org/wiki/E-commerce
2. http://cyber.law.harvard.edu/olds/ecommerce/introduction.html
3. http://ccm.net/contents/207-introduction-to-e-commerce-electronic commerce
4. http://www.indianmba.com/Faculty_Column/FC545/fc545.html
5. http://kaiserthesage.com/seo-strategies-resources/

### C) Major Equipment/ Instrument with Broad Specifications

| Sr.No. | Equipment/ Instrument | Specification |
|---|---|---|
| 1. | Desktop Computer | Processor: PIV or above<br>HDD: 40GB Min, RAM: 2GB or above<br>OS: 32 bit or 64 bit |
| 2. | Internet | 256 Kbps minimum |
| 3. | Networking Devices | Switches, Routers, Server etc |

## 10.0 MAPPING MATRIX OF PO'S AND CO'S:

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i | j | k |
| CO1 | H | H | | | | | | | | | L |
| CO2 | | | H | | M | | L | | | | |
| CO3 | | H | H | H | | | | M | | L | |
| CO4 | | H | | | L | | | | | M | |
| CO5 | H | | | | | M | | | H | | |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME :** Diploma Programme in Information Technology(IF) / Computer Technology(CM)
**COURSE :** Professional Practices (PPR) **COURSE CODE :** 6410

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| -- | -- | 04 | 04 | -- | Max. | -- | -- | -- | -- | -- | 50 | 50 |
| | | | | | Min. | -- | -- | -- | -- | -- | 20 | -- |

## 1.0 RATIONALE:

Most of the diploma holders join industries. Due to globalization and completion in the industrial and service sectors the selection for the job is based on campus interviews or competitive tests. While selecting candidates a normal practice adopted is to see general confidence, attitude and ability to communicate and attitude in addition to basic technological concepts.

The purpose of introducing professional practice is to provide opportunity to students to undergo activities which will enable them to develop confidence. Information search Industrial visits, expert lectures and case study will increase participation of students in learning process.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Understand techniques of data collection.
2. Study professional techniques through industrial visits and expert lectures.
3. Understand and find solutions for technical problems.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Collect technical information from different sources.
2. Write industrial visit reports.
3. Acquire technical knowledge through expert lecture.
4. Develop problem solving techniques through case studies.

## 4.0 COURSE DETAILS:

Note: There are no separate classes for theory as given below. The relevant theory has to be discussed before the practical during the practical sessions.

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics |
|---|---|---|
| **Unit-I**<br><br>**Information search and data collection** | 1a. Collect information from internet / newspaper / periodicals / magazines etc. Groups (4 to 5 students) have to search/collect information about any one of the given topic.<br>1b. Students will have to submit a report of about 8-10 pages. | 1.1 Manufacturing and costing of Computer hardware and software.<br>1.2 Advances in software Technology.<br>1.3 Information search related to IT Companies (Working Environment)<br>1.4 Information search related to Hardware & Networking Companies (Products and Features)<br>1.5 E-Business.<br>1.6 Making a business plan.<br>1.7 Information about Legendary Personalities through suitable websites (e.g. youtube). Human machine interface<br>1.8 Dynamic languages<br>1.9 Robotic surgery<br>1.10 Virtual keyboard<br>1.11 Wireless USB<br>1.12 Concept of cloud computing<br>1.13 Bubble sensing<br>1.14 Blu – ray disc<br>**Or**<br>1.15 any other suitable topic |
| **Unit-II**<br><br>**Industrial visit.** | 2a. Develop technical report writing skills on industrial visits | 2.1 Industrial visits and report writing of :<br>• Visit any Small scale/Large Scale Software Company<br>• Visit any BPO/KPO industry<br>• Visit any Software Development or Consulting firm/Center/industry |
| **Unit-III**<br><br>**Expert Lectures** | 3a. Lectures by Professional / industrial Expert to be organized from the following areas (any one) | 3.1 Project presentation tips.<br>3.2 Spoken English.<br>3.3 Personality development.<br>3.4 Current trends in IT.<br>3.5 How to develop positive thinking.<br>3.6 Advanced technical writing skill<br>3.7 SAP modules and career.<br>3.8 Career trends in computer / IT field<br>3.9 Intelligent computer system.<br>3.10 Advanced trends in hardware technology.<br>3.11 Advanced programming languages in IT field.<br>3.12 Introduction to Apprenticeship Training Scheme |
| **Unit-IV**<br><br>**Case Study** | 4a. Understand / Solve Computer Engineering problems by case study technique. | 4.1 Problem solving/ understanding through Case Study technique. (Any Two)<br>• Data Mining Process and Applications<br>• Big Data and its applications<br>• Information Retrieval and Processing<br>• Prepare a group of four students and study a specific topic from computer science field |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Not Applicable

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignment/task should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the desired programme outcome/course outcome.

***Note**: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in the mapping matrix for this course. Faculty should ensure that students also acquire Programme Outcomes/Course Outcomes related to affective domain.*

| S. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. required |
|---|---|---|---|
| 1 | I | **Information search, data collection and writing a report on the topic (Any Three.)**<br>a. Collection of Manufacturing and costing of Computer hardware and software.<br>b. Information search related to Hardware & Networking Companies.<br>c. Collect information about E-business.<br>d. Market survey on IT Companies.<br>e. Collect information about Robotics.<br>f. A group of four students is expected to Collect 4 to 6 advertises showing job opportunities for C++, RDBMS, Java, VB, .NET, hardware engineer etc. from newspaper and online resources as well as personally visiting the relevant industries and offices. | 24 |
| 2 | II | **Industrial visits**<br>a. Visit any one industry and find the knowledge and skills required for C++, RDBMS and Java Technologies. May also Visit related website.<br>b. Visit any one IT companies and how its work. | 16 |
| 3 | III | **Expert Lectures (Any Two)**<br>The lectures from professionals/ industry expert to be organized (2 hrs. duration) on any 2 topics of following suggested areas or any other suitable topics.<br>a. Project presentation tips.<br>b. Spoken English and Personality development.<br>c. Current trends in IT.<br>d. Advanced technical writing skill<br>e. SAP modules and career.<br>f. Career trends in computer / IT field. | 08 |
| 4 | IV | **Case study (Any Two)**<br>a. Study of different types of Hardware and software.<br>b. Case study on computer viruses.<br>c. Case studies on training and development.<br>d. Case studies on companies Act.<br>e. Case studies on communication skills. | 16 |
| | | **TOTAL** | **64** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Visit software industry in nearby places
2. Prepare Seminar on any latest trending topic in Computer/IT Field
3. Conduct Group Discussion on topic Suggested by Staff
4. Conduct a quiz competition on technical knowledge

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Show CAI computer software, arrange industrial visits, expert lectures, case studies related to computer engineering.

## 9.0 LEARNING RESOURCES:

**A)** National and international Journals and Magazine. New Building Construction, Inside Outside, Indian Concrete Journal, computer /IT Engineering.

**B) Software/Learning Websites**

1. http://www.mahapwd.com
2. www.Slideshow.com
3. www.icjonline.com

**C) Major Equipment/ Instrument with Broad Specifications**

Not applicable

## 10.0 MAPPING MATRIX OF PO'S AND CO'S:

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **a** | **b** | **c** | **d** | **e** | **f** | **g** | **h** | **i** | **j** | **k** |
| CO1 | | H | | | H | | H | H | H | | M |
| CO2 | | H | | | | | | M | H | | M |
| CO3 | | H | | | M | M | M | | | | M |
| CO4 | H | H | H | H | M | | | M | | | H |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME :** Diploma Programme in Information Technology(IF) / Computer Technology(CM)
**COURSE :** Seminar (SEM) **COURSE CODE :** 6411

**TEACHING & EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| -- | -- | 02 | 02 | -- | Max. | -- | -- | -- | -- | -- | 50 | 50 |
| | | | | | Min. | -- | -- | -- | -- | -- | 20 | -- |

## 1.0 RATIONALE:

An engineer or technician has to carry out variety of tasks & face problems and situations in his Professional life. He has to convey his ideas, communicate with people. Effective presentation of ideas, thoughts and information becomes a requisite skill for him.

The involvement of student in the seminar course will help him to plan and prepare the related topic by searching information from various sources, interact with others, analyze the information, document the content and present.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Develop abilities to search information
2. Suggest ideas through seminar
3. Collect data, information from various resources
4. Develop planning of seminar activities
5. Develop skill to communicate the problems and solutions
6. Develop skill to prepare reports
7. Develop presentation skills

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes as applicable to seminar:

1. Know and select seminar topic or problem statement in engineering field
2. Draft Problem statement or topic of seminar
3. Carry out literature survey from various resources
4. Write review of information search
5. Develop document preparation skills
6. Use of presentation skill for seminar delivery
7. Keep updated with latest trends in areas of engineering discipline

## 4.0 COURSE DETAILS:

| Activity No | Activities |
|---|---|
| 1 | Briefing about selection for seminar topics in class: Discussion in class |
| 2 | Search seminar topics and approval of topic from guide from searched topics. |
| 3 | Collection of data and literature for seminar from: internet/ visit/Journals/Books/EBooks |
| 4 | Preparation of synopsis of seminar topic: print draft copy |
| 5 | Submission of seminar synopsis to guide (Printed copy) |
| 6 | Guidance about preparation of document by guide |
| 7 | Preparation of document by students |
| 8 | Editing document |
| 9 | Submission of Seminar and presentation document: Hard copy & Soft copy of power point |
| 10 | Submission of diary |
| 11 | Seminar Presentation |

The activities mentioned above shall be monitored and guided by the guide every week during the contact hours provided for the same.

## 5.0 AREAS FOR SELECTION OF SEMINAR:

| Sr.No. | Areas For Selection |
|---|---|
| 1 | Green Technology |
| 2 | Advanced Application software's |
| 3 | Office Automation |
| 4 | Networking |
| 5 | Mobile Processing Technology |
| 6 | Latest Computerized controls |
| 7 | Automation |
| 8 | Computer Security |
| 9 | Cyber laws |
| 10 | Recent trends in Computer/Information Technology |
| 11 | Artificial Intelligence |
| 12 | Neural networks |
| 13 | Robotics |
| 14 | Parallel Computing, Super Computing |
| 15 | Antivirus software development |

## 6.0 SUGGESTED INSTRUCTIONAL STRATEGIES:

Classroom Teaching, Library Assignment, Group Discussion, Case Studies

## 7.0 LEARNING RESOURCES:

Magazines, Journals, Papers: National & international Reference Books, Internet, Previous seminars, Text Books, Codes of Practices e. g. IS Codes, Video Cassettes, Audio Cassettes, Compact Discs, Charts, Transparencies, Software, Models, Industrial visits, expert lectures/workshops

## 8.0 GUIDELINES FOR SEMINAR:

**1. Selection of topic for seminar:**

a. The student shall search from various resources and get the topic approved.
b. Topic of seminar shall be based on curriculum with new developments.
c. Topic of seminar should not be from the project taken by the group or by individual.
d. Selection of topic should be finalised in consultation with teacher guide allotted for the seminar.

**2. Submission of Seminar Document:**

a. The student shall get the seminar draft approved from Guide and complete final document.
b. Each student shall prepare two hard copies of final seminar document and retain one copy with student and submit one hard copy along with soft copy for department.
c. The structure of the seminar document shall be as per the following format: Certificate / Acknowledgement / Index / Introduction / Detailed content / Conclusion / References.
d. The seminar report shall be of minimum 10 pages and max. 20 pages with 1.5 line spacing. Font: New Times Roman, left margin 3 cm, right margin 1.5 cm, top margin 2 cm, bottom margin 2 cm, header & footer 1.5 cm, page numbers, size of font 12 pt, paragraphs left and right justified. It should be certified by seminar Guide and Head of department.

### 3. Evaluation of Seminar:

Evaluation of seminar will consist of Progressive Assessment, Presentation

#### i. Progressing Assessment:

1. Progressive assessment will be based on attendance, searching of various seminar topics, selection of title, collection of data from internet, Journals, Literatures, organization of data and preparation of document.
2. The student has to get seminar document assessed from guide regularly.
3. The attendance of the student shall carry 05 marks as follows
   a. Below 75 % : 00 marks
   b. 75 % and below 80 % : 02 marks
   c. 80 % and below 85 % : 03 marks
   d. 85 % and below 90 % : 04 marks
   e. 90 % and above : 05 marks

#### ii. Presentation of Seminar:

1. The time for presentation shall be 7 to 10 minutes per student
2. The question answer session time shall be 2 to 3 minutes per student
3. Evaluation of presentation of seminar will be carried out by a panel of teaching staff from institute based on the following point
   a. Confidence and courage
   b. Technical knowledge acquired
   c. Presentation skill
   d. Use of presentation medium e.g. A/V aids, animation

#### iii. Marking scheme for Seminar.

| Progressive assessment | Confidence and courage | Technical knowledge | Presentation skill | Use of media | Total |
|---|---|---|---|---|---|
| 25 | 05 | 05 | 10 | 05 | 50 |
| | | | | | |

### 9.0 MAPPING MATRIX OF PO'S AND CO'S:

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **a** | **b** | **c** | **d** | **e** | **f** | **g** | **h** | **i** | **j** | **k** |
| CO1 | | | | | | | | H | | | |
| CO2 | | | | | | | | M | | H | |
| CO3 | | H | | | | | | M | | | |
| CO4 | | | H | | M | | | | | L | |
| CO5 | | | | | | | | | H | M | |
| CO6 | | | | | | | | | | | |
| CO7 | | | | | | | | | | | H |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME** : Diploma Programme in Information Technology(IF) / Computer Technology(CM)
**COURSE** : Project (PRO) **COURSE CODE** : 6412

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| -- | -- | 04 | 04 | -- | Max. | -- | -- | -- | -- | 50 | 50* | 100 |
| | | | | | Min. | -- | -- | -- | -- | 20 | 20 | -- |

* Indicates TW to be assessed by external & internal examiners.

## 1.0 RATIONALE:

An Engineer or technician has to work on various projects in profession or field work. The aim of project is to develop the ability of "learning to learn' on its own, work in team. This would go a long way helping the students in keeping pace with future changes in technology and acquisition of Knowledge and skills as and when needed.

The scientific way of solving the problems and ability to apply it to find alternative solutions for the problems will help a technician in his professional life. This course will help to inculcate leadership skills, decision making, participative learning, resource management, cost considerations, documentation and report writing skills with effective communication.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Integrate the knowledge of engineering programme
2. Develop the skill to identify the problem & define the problem statement
3. Develop scientific attitude for stepwise solutions to the problems
4. Develop attitude to work in team and act as leader of project
5. Develop planning & execution skills
6. Build multidisciplinary concept with cost considerations
7. Understand recent developments in engineering fields and prepare report

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate some of course outcomes as applicable to project

1. Participate effectively in group work
2. Collect, analyse and synthesise the data
3. Conduct a survey and investigate the activities
4. Make appropriate decision
5. Act as leader for group task
6. Develop cost consideration
7. Prepare technical reports

## 4.0 COURSE DETAILS:

| Activity No | Activities |
|---|---|
| 1 | Formation of Group |
| 2 | Selection of Project: Individual/Group discussions |
| 3 | Define Problem statement for project work |
| 5 | Decide Strategies/Methodology to carry out project |
| 6 | Literature Survey/data survey |
| 7 | Submission of synopsis: by each group |
| 8 | Project activity plan-Defining activities, strategy, duration |
| 9 | Allocation of work responsibility to individual/team |
| 10 | Visits to Industries / Institutions / Market/field work/sites |
| 11 | Collection of Data /Survey/Analysis |
| 12 | Design of Components, preparation of drawing, estimates wherever required, |

| Activity No | Activities |
|---|---|
| | printed circuits design, its checking, |
| 13 | Fabrication, Assembling, Model/Prototype development, Testing as per project requirements |
| 14 | Progressive presentation of work and recording in diary |
| 15 | Consolidation of work allotted to individual or team |
| 16 | Presentation of initial draft: pre submission draft |
| 17 | Final Project Report: Printed: Submission: soft & Hard copy |
| 18 | Group presentation of project work at the time of final evaluation |

The activities mentioned above shall be monitored and guided by Project Guide every week during the contact hours provided for the same.

The Project is also included with Seminar with the aim to develop certain set communication skills (preparation of report, writing survey report writing Lab. experiment results writing conclusions of the work done and physical phenomenon observed, participating in group discussions, verbally defending the project in the form of Seminar etc.)

## 5.0 AREA OF SELECTION FOR PROJECT

These are only guidelines; any project related to Information Technology depending upon the availability of projects may be included. Preference should be given to practical oriented projects according to the local needs.

| Sr.No. | Areas For Selection |
|---|---|
| 1. | Green Technology |
| 2. | Advanced Application software's |
| 3. | Office Automation |
| 4. | Networking |
| 5. | Mobile Processing |
| 6. | Latest Computerized controls |
| 7. | Automation |
| 8. | Animation |
| 9. | Database programming |
| 10. | Accounting |
| 11. | Game Development |
| 12. | Inventory control system |
| 13. | Designing software development for IT Application |
| 14. | Electronic Data Processing |
| 15. | Instrumentation based IT Application |
| 16. | Interfacing of PC with Automated Devices. |

## 6.0 GUIDELINES FOR PROJECT:

### A. Group Formation:

1. The department Head / Officer in Charge shall make sure that the project groups are formed within **one week** of the beginning of academic term and assign a faculty as project guide.
2. The students may be asked to work in groups of five students. The group size may be varied in accordance with the effective compliance of project work.
3. The group can decide the leader and distribute work and prepare the group management structure.

### B. Finalization of Project Title:

1. The students are expected to take up a project with the guidance of a Project Guide from the institute/Industry Expert/Sponsored by industry, Institute, society, self.

2. Industrial project shall be encouraged.
3. The students can seek help from TPO/ HOD/Guide.
4. The group of students/Project guide/authority shall see the viability/ feasibility of project over the duration available with the students and capabilities and setup available.

**C. Note:**

1. The group / student shall prepare Project Diary with Name of Project, Name of Students in group, their attendance and progress and get assessed from guide from time to time during project hours.
2. The title of the project should be finalized within **two weeks** after the group formation and a synopsis of the project should be submitted to the guide.
3. An abstract (synopsis) not exceeding 100 words, indicating salient features of the work shall be submitted to guide.
4. Modify format suitably as per requirement of the project.

**D. Project Execution:**

1. Guide shall monitor the work and help the students from time to time.
2. The progress shall be presented before the guide every week during project hours.
3. The students shall design parts, prepare their drawing showing all details and manufacture within the institute / sponsoring industry / workshop in local areas.
4. The guide should maintain a record of progressive / continuous assessment of project work and observe the progress of each group member on weekly basis.
5. The same shall be kept ready for submission to the external examiner before the final examination.

**E. Evaluation of Project:**

1. The continuous evaluation of individual progress shall be followed
2. External examiner and guide shall jointly evaluate the project.
3. The project can be evaluated on site if it is difficult to bring or demonstrate the trials in the institute
4. The attendance of the student shall carry 05 marks as follows
   i. Below 75 % : 00 marks
   ii. 75 % and below 80 % : 02 marks
   iii. 80 % and below 85 % : 03 marks
   iv. 85 % and below 90 % : 04 marks
   v. 90 % and above : 05 marks
5. The details of project assessment are mentioned in Annexure II

**F. Project Report:**

1. The student shall get the initial draft copy of the project approved from the Project Guide.

2. Structure: It shall be as follows
   - Title page, Inner title page (white), Certificate, Certificate from Industry, Synopsis, Acknowledgment, Table of Contents, List of table & figures (optional), Introduction, Objectives of the Project, Methodology used, Design, Drawing of the part and assembly, Testing, Costing, Result, Conclusions & Scope for future, Merits, Demerits, Applications, Bibliography
   - Annexure consists of various designed parts and assembly drawings, photographs, charts, statistical data
   - CD of video clips /Power Point presentation

3. Each group has to submit one copy of project report to the library and one soft and hard copy to the department apart from the individual copy.
4. The project report will be of 40 to 50, A4 Size pages with 1.5 line spacing. Font: New Times Roman, left margin 3 cm, right margin 1.5 cm, top margin 2.5 cm, bottom margin 1.5 cm, header & footer 1.5 cm, page numbers, size of font 12 pt, paragraphs left and right justified.
5. Chapters (to be numbered in Arabic) containing Introduction-which usually specifies scope of work and the present developments. Main body of the report divided appropriately into chapters, sections and subsections. The chapters, sections and subsections may be numbered in the decimal form for e.g. Chapter 2, sections as 2.1, 2.2 etc. and subsections as 2.2.3, 2.5.1 etc.
6. The chapter must be left or right justified (font size 16). Followed by the title of chapter centered (font size 18), section/subsection numbers along with their headings must be left justified with section number and its heading in font size 16 and subsection and its heading in font size 14. The body or the text of the report should have font size 12.
7. The figures and tables must be numbered chapter wise.
8. The last chapter should contain the summary of the work carried, contributions if any, their utility along with the scope for further work.
9. Reference OR Bibliography:

   The references should be numbered serially in the order of their occurrence in the text and their numbers should be indicated within square brackets for e.g. [4].
   The section on references should list them in serial order in the following format.
   i. For textbooks – Dr. V.L. Shah & Veena Gore, Limit State Design of Steel Structures, Structures Publications, 1 Edition, 2009.
   ii. For papers - David, Insulation design to combat pollution problem, Proc of IEEE, PAS, Vol 71, Aug 1981, pp 1901-1907.
   iii. Only SI units are to be used in the report. Important equations must be numbered in decimal form.
10. All equation numbers should be right justified.
11. Each student from group shall have one copy with individual certificate only.
12. The project report and progressive assessment sheets are to be submitted before the end of term declared in the Academic Calendar of the institute.

**7.0 MAPPING MATRIX OF PO'S AND CO'S:**

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **a** | **b** | **c** | **d** | **e** | **f** | **g** | **h** | **i** | **j** | **k** |
| CO1 | H | | | | | | | | | | |
| CO2 | | H | | | | | | | | | |
| CO3 | | | | | | | M | | | | |
| CO4 | M | | | | | L | | | | | |
| CO5 | | | | L | | | M | | | | |
| CO6 | | | H | | | | H | | | | |
| CO7 | | | H | | | | | | | | |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME :** Diploma Programme in Information Technology(IF) / Computer Technology(CM)
**COURSE :** Software Engineering (SWE) **COURSE CODE :** 6434

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 03 | -- | -- | 03 | 03 | Max. | 80 | 20 | 100 | -- | -- | -- | 100 |
| | | | | | Min. | 32 | -- | 40 | -- | -- | -- | -- |

## 1.0 RATIONALE:

Software engineering is the establishment and sound engineering principles applied to obtain reliable and efficient software in an economical manner. Software engineering is the application of a systematic, disciplined, quantifiable approach to the development, operation and maintenance of software. Software engineering encompasses a process, management techniques, technical methods and the use of tools. This course helps the students to understand software engineering principles.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Plan & develop the frame work of project.
2. Compare various project process models & use in project planning.
3. Identify the duties & responsibilities of People, team leader & stakeholders while planning the software project.
4. Schedule the project according to time, size, shape, utility & application.
5. Understand the basic concept of Quality and standards.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Identify and apply appropriate model for undertaking project
2. Use software measurement metrics and integrate it with software process
3. Identify the duties & responsibilities of People, team leader & stakeholders while planning the software project.
4. Schedule the project according to time, size, shape, utility & application.
5. Understand the basic concept of Quality and standards.
6. Understand and apply risk management and project planning concepts

**4.0 COURSE DETAILS:**

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Introduction to Software Engineering** | 1a. Introduction to Software Engineering<br>1b. Recognize Software Types<br>1c. Define Relationships<br>1d. Memorise Layered Approach<br>1e. Study Interpret Framework<br>1f. Comparison PSP and TSP<br>1g. Remember Process Model | 1.1 Definition of Software and Characteristics of Software<br>1.2 Types / Categories of Software<br>1.3 Software Engineering – Definition, Need<br>1.4 Relationship between Systems Engineering and Software Engineering<br>1.5 Software Engineering- A Layered Technology Approach<br>1.6 Software Development Generic Process Framework- Software Process, Software Product, Software Work-Product, Basic Framework Activities, Umbrella Activities<br>1.7 Personal and Team Process Models (PSP and TSP) –Concept, Significance with respect to Ongoing Process Improvement, Goals, List of framework activities included<br>1.8 Prescriptive Process Models-<br>• The Waterfall Model<br>• The Incremental Model<br>• RAD Model<br>• Prototyping Model<br>• Spiral Model | 07 |
| **Unit-II**<br><br>**Project Management Concept and Metrics** | 2a. Explain PPP and W5HH Principle<br>2b. Explain Measurement, Metrics and Quality<br>2c. Choose Integrating Metrics | 2.1 The management Spectrum-- People, Product, Process, Project, W5HH Principle.<br>2.2 Software Measurement, Metrics for Software Quality,<br>2.3 Integrating Metrics within Software Engineering Process, metrics for small Organization | 07 |
| **Unit-III**<br><br>**Software Project Planning and Risk** | 3a. Establish Project Planning<br>3b. Interpret Risk and it factors | 3.1 Project planning objective, Software scope, Resources,<br>3.2 Software Risk, Risk Identification, Risk Projection, Risk Refinement | 06 |
| **Unit-IV**<br><br>**Project Scheduling And Tracking** | 4a. Outline Scheduling and Tracking | 4.1 Basic principles, Relationship Between People and Effort, Task set for Software Project, Scheduling, Error Tracking, The Project Plan | 06 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-V**<br><br>**Software Engineering Analysis And Design** | 5a. Construction And Deployment Principles<br>5b. Requirements Engineering<br>5c. Analysis Principles<br>5d. Requirement Specification<br>5e. Design Approaches | 5.1 Communication, Planning, Modeling, Construction & Deployment principles.<br>5.2 Requirements Engineering Tasks, Initiating the requirement Process.<br>5.3 Analysis Principles: Information Domain, Modeling, Partitioning<br>5.4 requirement specification & review<br>5.5 Design approaches of software & preparation of design model using Design concepts, Design model, pattern based design | 14 |
| **Unit-VI**<br><br>**Software Quality Management & Estimation** | 6a. Basic concepts<br>6b. Explain Quality assurance<br>6c. Explain ISO 9000 quality standards<br>6d. Explain McCall's quality factors.<br>6e. Explain Decomposition Techniques<br>6f. Explain Empirical Estimation Model | 6.1 Basic Quality Concepts.<br>6.2 Software Quality Assurance, Statistical software quality assurance, Software Reliability<br>6.3 The ISO 9000 quality standards<br>6.4 McCall's quality factors.<br>6.5 Decomposition Techniques: Problem based Estimation, Process Based Estimation<br>6.6 Empirical Estimation Model: The structure of estimation models ·COCOMO Model, Software Equation | 08 |
| **TOTAL** | | | **48** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

| Unit No. | Unit Title | Distribution of Theory Marks | | | |
|---|---|---|---|---|---|
| | | **R Level** | **U Level** | **A and above Levels** | **Total Marks** |
| I | The Product and The Process | 06 | 06 | 02 | 14 |
| II | Project Management Concept and Metrics | 06 | 04 | 04 | 14 |
| III | Software Project Planning and Risk | 04 | 04 | 04 | 12 |
| IV | Project Scheduling and Tracking | 04 | 02 | 04 | 10 |
| V | Software Engineering Analysis and Design | 04 | 06 | 08 | 18 |
| VI | Software Quality Management and Estimation | 02 | 04 | 06 | 12 |
| | **TOTAL** | **26** | **26** | **28** | **80** |

**Legends:** R = Remembrance (Knowledge); U= Understanding; A= Application and above levels (Revised Bloom's taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

Not Applicable

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Discuss various software process models.
2. Prepare case study for software engineering.
3. Study latest trends in Software engineering
4. For Software project scheduling and tracking, Use online Software Project Planning and tracking web application like **toms planner**. For more information Please do visit: www.tomsplanner.com/
5. Prepare seminars on various topics like software quality management.

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Concept will be introduced in lectures using charts or ppt.
2. Arrange expert seminar of industry person in the area of Software engineering.
3. Arrange expert seminar of industry person on latest trends in Software engineering and various changes in traditional Software Development Process.

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Software Engineering- A Practitioners Approach | Roger S. Pressman | Tata McGraw Hill Publication |
| 2 | Software Engineering- Principles and Practice | Waman S. Jawadekar | Tata McGraw Hill Publication |
| 3 | Software Engineering | Kogent learning solutions inc. | Dreamtech Press |

### B) Software/Learning Websites

1. http://www.tutorialspoint.com/software_engineering/
2. http://www.freetutes.com/systemanalysis/

### C) Major Equipment/ Instrument with Broad Specifications

Not Applicable

## 10.0 MAPPING MATRIX OF PO'S AND CO'S:

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **a** | **b** | **c** | **d** | **e** | **f** | **g** | **h** | **I** | **j** | **k** |
| CO1 | | M | | M | H | M | H | | M | | |
| CO2 | L | L | L | | | | L | M | L | H | |
| CO3 | | H | M | L | | | | L | H | M | |
| CO4 | | | | | | | | | L | H | |
| CO5 | L | M | M | | | | | | | | |
| CO6 | | M | M | H | | | | | | H | L |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME :** Diploma Programme in Information Technology(IF) / Computer Technology(CM)
**COURSE :** Digital Techniques (DTE) **COURSE CODE :** 6436

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 03 | -- | 02 | 05 | 03 | Max. | 80 | 20 | 100 | -- | -- | 25 | 125 |
| | | | | | Min. | 32 | -- | 40 | -- | -- | 10 | -- |

## 1.0 RATIONALE:

This course forms the foundation of computers. This course is introduced with the view that students will be familiar with various digital devices and circuits which are used in microprocessor, Computer & other digital systems. This course emphasizes on the combinational and sequential logic design and mainly deals with the medium scale integrated circuits.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Understand various logic families and number system.
2. Understand Boolean algebra and design the logic circuits.
3. Elaborate operation of different digital circuits like combinational circuits, Sequential circuits
4. Know different types of memories in computers.
5. Construct the digital circuits using logic devices.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Compare Analog and Digital systems.
2. Select a logic gate for specific application.
3. Illustrates the principle of working of simple digital circuits.
4. Assemble/Develop Simple Digital circuits using Logic devices.
5. Troubleshoot the fault in a given digital circuit.

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Digital Techniques and Number System** | 1a. Compare Analog and Digital System.<br>1b. Classify Digital logic families.<br>1c. Comprehend Number systems and Binary codes<br>1d. Convert one form of number into another.<br>1e. Solve numerical based on binary and BCD arithmetic. | 1.1 Digital signal, Digital and Analog System.<br>1.2 Comparison of analog and digital system.<br>1.3 Digital systems- Positive and Negative Logic, Advantages, Disadvantages and Applications of Digital Systems<br>1.4 Logic families- Characteristics, Classification - TTL, CMOS, ECL (Comparison only) (No circuits)<br>1.5 Number system and codes : Classification-Binary, Octal, Decimal, Hexadecimal number system, Conversion of one number systems to another, 1's complement and 2's complement, Binary arithmetic, BCD codes (Conversion of | 08 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | | invalid BCD numbers into valid BCD number). | |
| **Unit-II**<br><br>**Logic Gates And Boolean Algebra** | 2a. Draw Symbol of different kinds of Logic Gates and Classify Logic Gates.<br>2b. Write Truth Table and Logic expression of various Logic Gates.<br>2c. State and apply Boolean laws and Demorgan's Theorem to solve Boolean expression.<br>2d. Simplify Boolean expression using K-map technique. | 2.1 Concept of Logic gates, Basic Logic Gates: NOT and, OR with symbol, truth tables, logic equations & applications.<br>2.2 Universal Logic Gates: NAND, NOR with symbol, truth table logic equations & applications. NOR as a universal gate, NAND as a universal gate.<br>2.3 Special type of logic gates: EX-OR, EX-NOR: with symbol, truth table & applications.<br>2.4 Boolean Algebra: Basic Boolean Laws, Demorgan's Theorem, Concept of SOP & POS, Standardization<br>2.5 Concept of K map: Definition, Advantages, Representation of 2, 3, 4 variable K-map, K- map reduction technique, don't care condition, Reduction of simple Boolean expression using K-map. | 10 |
| **Unit-III**<br><br>**Combinational Logic Circuits** | 3a. Explain basic combinational Logic.<br>3b. Design Half adder, Subtractor and full adder, Subtractor using K-map<br>3c. Describe operating principle of working of different Multiplexer and Demultiplexer types.<br>3d. Draw block diagram and explain operation of different Encoder and Decoder types. | 3.1 Introduction to combinational logic circuits<br>3.2 (a) Half adder and Half Subtractor, (b) Full adder and Full Subtractor: Block diagram, Truth table and designing using K-map and basic logic gates.<br>3.3 Multiplexers: Necessity of multiplexing, Multiplexer types :2 : 1, 4 : 1, 8 : 1- Block diagram, operating principle, Truth table & Applications, Multiplexer Tree<br>3.4 Demultiplexer: Necessity of Demux. Types of Demux: 1: 2, 1: 4, 1: 8- Block diagram, operating principles Truth table & Applications<br>3.5 Encoder: Definition, Priority Encoders: Decimal to BCD Encoder (IC 74147) –pin diagram, Truth table.<br>3.6 Decoders: Definition, Types-(3:8 Decoder) – Block diagram, Truth table | 12 |
| **Unit-IV**<br><br>**Sequential Logic Circuits** | 4a. Compare between Combinational and Sequential Logic.<br>4b. Define triggering and state its types.<br>4c. Describe the function of various types of flip-flops with the help of Logic diagram and truth table.<br>4d. Explain the working of various types of Counters with the help | 4.1 Introduction to Sequential logic circuit, difference between combinational & Sequential logic circuit.<br>4.2 One-bit memory cell, clock signal – Triggering methods: edge triggering and level triggering (Positive and Negative).<br>4.3 Flip Flops - R S flip-flop, Clocked R S flip flop, J-K flip flop, Master slave J-K flip flop, D- flip flop and T-flip flop : using NAND gates - Symbol, Logic diagram, working, truth table<br>4.4 Concept of Preset & Clear, Race around condition | 12 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | of circuit diagram, truth table and timing diagram.<br>4e. Describe the working of various shift Registers with the help of circuit diagram, truth table and timing diagram and State Applications of Shift register. | 4.5 Counters: Basic concept of counter, Classification of Counters: Synchronous and Asynchronous/ripple.<br>4.6 Asynchronous counter (3 bit, 4 bit), Mod-N-counter, -Designing, Working, Truth Table, Timing diagram<br>4.7 Shift register: Definition, Types: SISO, SIPO, PISO and PIPO (4-bit)-Block diagram, Working, Truth Table, Timing diagram and Applications. | |
| **Unit-V**<br><br>**Semiconductor Memories** | 5a. Classify semiconductor Memories<br>5b. State and explain different RAM and ROM types. | 5.1 Introduction to memories, Classification<br>5.2 RAM Types: SRAM, DRAM-Explanation<br>5.3 ROM Types: PROM, EPROM, $E^2$PROM-Explanation | 02 |
| **Unit-VI**<br><br>**Data Converters** | 6a. State Necessity of Data Converters.<br>6b. State Specifications of D/A and A/D Converters.<br>6c. Explain working of D/A converters and A/D converters. | 6.1 Need of data converters, types of data converter<br>6.2 DAC:R-2R Ladder - Circuit diagram, Working, Advantages and Disadvantages, DAC specifications (No Mathematical Derivations)<br>6.3 ADC - Successive approximation -Circuit diagram, working, Advantages and Disadvantages-ADC Specifications(No Mathematical Derivations)<br>6.4 Study of ICs: DAC0808, ADC 0809-Features and Pin Description. | 04 |
| | | **TOTAL** | **48** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

| Unit No. | Unit Title | Distribution of Theory Marks | | | |
|---|---|---|---|---|---|
| | | R Level | U Level | A Level | Total Marks |
| I | Digital Techniques and Number System | 04 | 06 | 02 | 12 |
| II | Logic Gates And Boolean Algebra | 02 | 08 | 04 | 14 |
| III | Combinational Logic Circuits | 04 | 10 | 06 | 20 |
| IV | Sequential Logic Circuits | 04 | 10 | 08 | 22 |
| V | Semiconductor Memories | 00 | 04 | 00 | 04 |
| VI | Data Converters | 02 | 06 | -- | 08 |
| | **TOTAL** | **16** | **44** | **20** | **80** |

**Legends:** R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

***Note**: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

| S. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. required |
|---|---|---|---|
| 1 | II | Build/Test the functionality of Basic Logic Gates.<br>• Verify the Truth table of Basic gates (AND, OR, NOT). | 02 |
| 2 | II | Build/Test the functionality of Advance Logic Gates.<br>• Verify Truth table of Advance logic gates (NAND, NOR, EXOR, EXNOR). | 02 |
| 3 | II | Verify the De-Morgan's 1st and 2nd theorem. | 02 |
| 4 | II | Build/Test NAND and NOR as universal gate.<br>(Implement basic gates using universal gates) | 04 |
| 5 | III | Design and Implement Half and full adder circuit.<br>• Verify truth table of Half and Full adder circuit | 04 |
| 6 | III | Build/Test half and full Subtractor circuit using EX-OR and, OR logic gates. | 04 |
| 7 | III | Build/Test the 8:1 Multiplexer circuit. | 02 |
| 8 | IV | Verify the truth table of RS, D Flip Flops. | 02 |
| 9 | IV | Build/Test the working of the SISO Shift Register. | 02 |
| 10 | V | Build/Test the operation of 3-bit Asynchronous Counter using JK Flip Flop. | 02 |
| 11 | V | Design and implement mod- 7 counter using JK Flip-Flop. | 02 |
| 12 | VI | A Mini Project (Design, Assemble, Test and Troubleshoot) integrating minimum two digital ICs). | 04 |
| **TOTAL** | | | **32** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like:

1. Read and note down specifications of Digital ICs using data sheet: IC number/ Pin Diagram/voltage levels, applications for the following Digital ICs (TTL/CMOS): AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR gates, Decoder, Multiplexer, BCD to 7-segment decoder, SR FF, JK FF, D FF, ADC, DAC. (Any four).
2. Market survey to collect data about Prices of different Digital ICs.
3. Assemble and Test simple Digital circuit on breadboard.
4. Prepare mini project using Various Digital ICs.

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Show animation videos to demonstrate the working principles Digital circuits like Shift Register, Counter etc.
2. Arrange expert lecture of an Industry Person/Trained Faculties in the area of Digital electronics.
3. Teacher guided self learning activities.

## 9.0 LEARNING RESOURCES:

### A) Books

| S. No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Modern Digital Electronics | R. P. Jain | Tata McGraw Hill |
| 2 | Digital Logic and Computer Design | M. Morris Mano | Pearson Education, New Delhi, 2011 or latest |
| 3 | Digital Principles and Application | Malvino and Leech | TMH Pub., New Delhi, 6th Edition or latest |
| 4 | Digital Electronics and Logic Design | Sharma Sanjay | S. K. Kataria & Sons, 2012 or latest |
| 5 | Fundamentals of Digital Circuits | A. Anand Kumar | PHI, 2009 or latest |

### B) Software/Learning Websites

1. http://www.alldatasheet.com
2. http://www.asic-world.com/digital/index.html
3. http://www.digitalcircuits.com

### C) Major Equipment/ Instrument with Broad Specifications

1. Digital Logic Trainer Board
2. Cathode ray oscilloscope
3. Regulated power supply
4. Breadboards
5. Logic Gates – Experimental kit
6. Half and full Adder, Subtractor – Experimental kit
7. Demorgan's theorem – Experimental kit
8. NAND AND NOR gate as Universal gate– Experimental kit
9. RS, D Flip Flop – Trainer kit
10. SISO Shift Register-Trainer Kit
11. Asynchronous Counter Using JK-Flip Flop-Trainer Kit
12. Digital IC tester

## 10.0 MAPPING MATRIX OF PO'S AND CO'S:

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i | j | k |
| CO1 | H | L | L | | | | | | | | |
| CO2 | L | M | H | | | | | | | | |
| CO3 | L | H | | | | | | | | L | L |
| CO4 | L | | H | | | | | | | | |
| CO5 | L | | H | | | | | | L | L | |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME** : Diploma Programme in Information Technology(IF) / Computer Technology(CM)
**COURSE** : Java Programming (JPR) **COURSE CODE** : 6437

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 03 | -- | 04 | 07 | 03 | Max. | 80 | 20 | 100 | 25 | -- | 25 | 150 |
| | | | | | Min. | 32 | -- | 40 | 10 | -- | 10 | -- |

**1.0 RATIONALE:**

Java language is an object oriented programming language that was designed to meet the need for a platform independent language. Java used to create Application that run on a single computer as well as distributed network. Java is both a language and a technology used to develop Internet based Applications with this increasing use of Internet. Java has become a widely used programming language.

Further this course, which includes learning core java, forms a foundation for learning advanced Java.

**2.0 COURSE OBJECTIVES:**

The student will be able to,

1. Explain object oriented programming concept of java.
2. Use inheritance, package and interfaces.
3. Use multithreading and exception handling.
4. Understand applet and use graphics programming, java collections, handle files.
5. Use java programming concepts to write and implement small java applications.

**3.0 COURSE OUTCOMES:**

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Understand and apply object oriented programming concepts of java.
2. Implement inheritance, packages and interfaces.
3. Implement multithreading and exception handling.
4. Create applet and use graphics programming, collections, handle files.
5. Use java programming concepts to write and implement small java applications.

**4.0 COURSE DETAILS:**

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Introduction and Features of Java** | 1a. Features of Object Oriented Programming<br>1b. Java Features<br>1c. Data Types in Java<br>1d. Operator and Expression<br>1e. Decision making and Branching Statement.<br>1f. Decision making and Looping Iteration. | 1.1 Object and Classes, Data abstraction and encapsulation, Inheritance, Polymorphism, Dynamic Binding, Reusability of Code, Modularity of Code.<br>1.2 Simple, Compiled and Interpreted, Platform independent and portable, Object oriented<br>1.3 Distributed, Multithreaded and interactive, High performance, Secure., difference between JDK, JRE, JVM<br>1.4 Data Types, Constant, Symbolic Constant, Scope of variable, Type casting, standard default values, Java | 10 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | | Literals.<br>1.5 Arithmetic Operators, Bit wise Operator, Relational Operators, Boolean Logical Operators, Assignment Operator, Increment and Decrement Operator, Conditional Operator, Operator Precedence.<br>1.6 Java's Selection Statement, if statement, The if else statement, The else if ladder, The switch statement, The ?: Operator<br>1.7 The While statement, The do while statement, The **for** statement, The For-Each version of the for loop, Nested Loops, Jumps in Loops, Labeled Loops, Mathematical Functions - min(), max(), sqrt(), pow(), exp(), round(), abs(). | |
| **Unit-II**<br><br>**Classes, Object and Methods** | 2a. Defining a class, creating object<br>2b. Inheritance<br>2c. Visibility Control<br>2d. Array, Strings, Vectors and Wrapper Class | 2.1 class Fundamentals, Declaring and Creating object, Accessing class members and methods, Constructors, this keyword, Garbage collection, finalize() method, Method Overloading, Static Member, using Command-Line arguments, using Objects as Parameters., nested classes.<br>2.2 Types of Inheritance, single Inheritance, multilevel Inheritance, Hierarchical Inheritance, method & constructor Overloading & overriding, dynamic method dispatch, final variables, final methods, use of super, abstract methods & Classes, static members.<br>2.3 Public access, Default access, Private access, Protected access. Arrays, One Dimensional array, Creating an array, Two Dimensional array, String, StringBuffer, Vectors, Wrapper Classes | 08 |
| **Unit-III**<br><br>**Packages and Interfaces** | 3a. Packages<br>3b. Interface | 3.1 Define a Package, Access Protection, Creating Package, Import a package, adding a class and interfaces to a package<br>3.2 Defining interfaces, Extending interfaces, Implementing interfaces, Accessing Interface variable, Applying Interfaces. | 08 |
| **Unit-IV**<br><br>**Multithreaded Programming and Exception handling** | 4a. Multi Threading<br>4b. Managing Errors and Exceptions | 4.1 The Java Thread Model, The Main Thread, Creating Thread By extending to thread class & by Implementing runnable Interface, Life cycle of thread: thread methods: wait(), sleep(), notify(), resume(), suspend(), stop()., Creating multiple Threads, using | 08 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | | isAlive() and join(), Thread Priorities, Synchronization, Interthread Communication, Suspending, Resuming and, Stopping Threads.<br>4.2 Exception handling fundamentals, Exception Types, Using Try and Catch, Multiple try and catch statement, throw, throws, using finally statement, Creating own Exception, Chained Exceptions. | |
| **Unit-V**<br><br>**Graphics Programming And Internet** | 5a. Applet Programming<br>5b. Graphics Programming | 5.1 Applet Class, Applet Architecture, Local and remote applets, How applet differ from application, Preparing to write applets, Building applet code, Applet life cycle, Applet tag, Adding Applet to HTML file, Running the Applet, Passing parameter to applet<br>5.2 The Graphics Class, Lines and rectangle, Circle and Ellipse, Drawing Arcs, Drawing Polygons, Line Graphs, working with Color, Color methods, working with Fonts, Font Metrics, Determining available Fonts | 08 |
| **Unit-VI**<br><br>**File I/O and Collection frame work and More Utility Classes** | 6a. File Classes<br>6b. Introduction to collections frame work<br>6c. Utility Classes | 6.1 Stream classes, byte stream (FileInputStream and FileOutputStream), Character stream (FileReader and FileWriter), Serialization., basic file operations<br>6.2 Introduction to collections framework, Array List, LinkedList, HashSet class, using Iterator, Map class.<br>6.3 Date, Calendar, Random. | 06 |
| | **TOTAL** | | **48** |

**5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):**

| Unit No. | Unit Title | Distribution of Theory Marks | | | |
|---|---|---|---|---|---|
| | | R Level | U Level | A and above Levels | Total Marks |
| I | Introduction And Features of Java | 06 | 04 | 04 | 14 |
| II | Classes, Object and Methods | 04 | 04 | 04 | 12 |
| III | Packages and Interfaces | 06 | 02 | 04 | 12 |
| IV | Multithreaded Programming and Exception handling | 04 | 06 | 06 | 16 |
| V | Graphics Programming And Internet | 02 | 06 | 06 | 14 |
| VI | File I/O Streams and Collections and more Utility Classes | 02 | 04 | 06 | 12 |
| | **TOTAL** | **24** | **26** | **30** | **80** |

**Legends:** R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignment/task should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the desired programme outcome/course outcome.

***Note**: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in the mapping matrix for this course. Faculty should ensure that students also acquire Programme Outcomes/Course Outcomes related to affective domain.*

| S. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Hours |
|---|---|---|---|
| 1 | I, II | Write a simple java program to demonstrate use of command line arguments in java. (Addition of two numbers, use of mathematical functions). | 04 |
| 2 | II | Write a Java Program to define a class, overload the constructors and instantiate its object | 04 |
| 3 | II, II | Write a Java Program to define a class, define instance methods and overload them and use them for dynamic method invocation. | 04 |
| 4 | II | Write a Java Program to demonstrate use of nested class. | 04 |
| 5 | II | Write a Java Program to practice<br>• Use of single Dimensional array.<br>• Use of multidimensional array. | 04 |
| 6 | II | Write a Java program to practice<br>• Using String class and its methods.<br>• Using String Buffer class and its methods. | 04 |
| 7 | II | Write a Java Program to implement Wrapper classes and their methods. | 04 |
| 8 | III | Write a Java Program to implement multilevel inheritance by applying various access controls to its data members and methods. | 04 |
| 9 | III | Write a program to demonstrate<br>• Use of implementing interfaces.<br>• Use of extending interfaces. | 04 |
| 10 | IV | Write a program to implement the concept of threading. | 06 |
| 11 | IV | Write a program to implement the concept of Exception Handling<br>• Using predefined exception.<br>• By creating user defined exceptions. | 04 |
| 12 | V | Write a program using Applet<br>• To display a message in the Applet.<br>• For configuring Applets by passing parameters. | 08 |
| 13 | VI | Write program to demonstrate use of I/O streams. | 04 |
| 14 | VI | Write a Program to use of Array List class/Linked List class/ Map class. | 06 |
| | | **TOTAL** | **64** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Study different IDE available for java. e.g. eclipse, netbeans.
2. Study available small java application developed on internet and reuses it in your application.
3. Present your application and discuss various aspects of software e.g. security, efficiency, cost etc.

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Arrange expert seminar of industry person in the area of software development in java.
2. Conceptual knowledge will be shared interactively using LCD projector.

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | The complete reference java seventh edition | Herbert Schildt | Tata McGraw Hill |
| 2 | Programming with java | E. Balagurusamy | BPB Publication |
| 3 | Java2 programming | Keyur Shah | Tata McGraw Hill |
| 4 | Java2 Unleashed | Jawroski | Techmedia |

### B) Software/Learning Websites

1. http://www.oracle.com/technetwork/java/index.html
2. http://www.tutorialspoint.com/java/
3. http://www.javatpoint.com/java-tutorial
4. http://www.wikihow.com/Install-Ubuntu-Linux
5. http://www.sun.java.com

### C) Major Equipment/ Instrument with Broad Specifications

| Sr.No. | Equipment | Specification |
|---|---|---|
| 1 | Desktop Computer | Processor: intel core i5<br>Memory: at least 4GB RAM<br>Hard drive: at least 320GB hard disk |
| 2 | LCD Projector | Display Type: LCD<br>Light Output: 3200 Lumens |

## 10.0 MAPPING MATRIX OF PO'S AND CO'S:

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i | j | k |
| CO1 | H | H | H | L | L | | | | | | |
| CO2 | | H | H | | | | | | | | |
| CO3 | | | H | H | | | M | L | | | |
| CO4 | M | M | | H | H | | M | | | | |
| CO5 | | | | H | | L | M | H | M | H | H |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME** : Diploma Programme in Information Technology(IF) / Computer Technology(CM)
**COURSE** : Software Testing (STG) **COURSE CODE :** 6438

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 03 | -- | 02 | 05 | 03 | Max. | 80 | 20 | 100 | -- | -- | 25 | 125 |
| | | | | | Min. | 32 | -- | 40 | -- | -- | 10 | -- |

## 1.0 RATIONALE:

This course is for teaching the basic to advanced level concepts in software testing. It also includes technical as well as supporting skills necessary to become successful tester. In this course student will learn how to immediately find problems in any computer program, how to plan an effective test approach, how to clearly report your finding and how to tell when your software is ready for release.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Find defects which may get created by programmer while developing software.
2. Ensure that end results meet business and user requirements.
3. Apply manual and automation testing of software to ensure its correctness, completeness, quality and security and also report the testing efforts to test manager and developer.
4. Design test plan for effective test approach.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Identify impact of software bug and importance of software testing.
2. Select appropriate method for testing depending on purpose of testing and apply it.
3. Design test cases for any software under test.
4. Execute test cases on software under test to validate its functionality.
5. Report the testing efforts in manual format and in defect tracking system.
6. Use various automation tools for testing.

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Software Testing Background** | 1a. Identify need of software testing<br>1b. Define suspicious situation as a bug<br>1c. Describe various terminologies used in testing later on wherever needed. | 1.1 Software error case studies – Disney Lion King, Intel Floating Point Division Bug, NASA Mars Polar Lander, Y2K Bug<br>1.2 Bug: Terms for software Failures, A Formal Definition, Bug occurrence, cost of bugs, Goal of software tester, Traits for Good software tester<br>1.3 Software Development life cycle<br>1.4 Software Testing: Definition, goal of Software Tester<br>1.5 Testing Axioms<br>1.6 Software Testing Life Cycle<br>1.7 Software Testing Terms: Precision and Accuracy, Verification and | 08 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | | Validation, Quality and Reliability, Quality Control, Quality Assurance, V model. | |
| **Unit-II**<br><br>**Testing methodologies** | 2a. Distinguish between various testing methods.<br>2b. Identify purpose and accordingly select appropriate method.<br>2c. Apply various black box testing techniques. | 2.1 Black Box and White Box Testing<br>2.2 Static and Dynamic Testing<br>2.3 Static Black Box Testing: Testing the Specification, Performing a High-level Review of the Specification, Low level Specification Test Techniques<br>2.4 Dynamic Black Box Testing:<br>• Test-to-pass and Test-to-Fail,<br>• Equivalence Partitioning,<br>• Data Testing: Boundary Conditions, Sub-Boundary Conditions, Default, Empty, Blank, Null, Zero and None, Invalid, Wrong, Incorrect and Garbage Data<br>• State Testing: Testing Software's Logic Flow, Testing States to Fail<br>• Other Black Box Test Techniques: Behave like a Dumb User, Look for the Bugs where you have already found them, think like a Hacker, Follow experience, intuition and Hunches | 08 |
| **Unit-III**<br><br>**Code Examination** | 3a. Distinguish between various testing methods<br>3b. Identify purpose and accordingly select appropriate method<br>3c. Apply various white box testing techniques<br>3d. Distinguish Dynamic White Box Testing and Debugging | 3.1 Static White Box Testing:<br>• Formal reviews: Peer Reviews, Walkthrough, Inspection<br>• Coding Standards and Guidelines<br>• Generic Code Review Checklist: Data Reference Errors, Data Declaration Errors, Computation Errors, Comparison Errors, Control Flow Errors, Subroutine Parameter Errors, Input/Output Errors<br>3.2 Dynamic White Box Testing<br>• Testing the Pieces<br>• Data Coverage: Data Flow, Sub Boundaries, Formulas and Equations, Error Forcing<br>• Code Coverage<br>• Dynamic White Box Testing Vs Debugging | 08 |
| **Unit-IV**<br><br>**Types of testing** | 4a. Differentiate among various types of testing<br>4b. Identify appropriate type of testing according to requirement of testing. | 4.1 Unit Testing: Stub and Driver<br>4.2 Integration Testing: Top-Down, Bottom-Up, Sandwich approach<br>4.3 System Testing : Functional Requirement testing and Non Functional Requirement Testing<br>4.4 Acceptance testing: Alpha and Beta testing. | 08 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | 4c. Test the software with respect to all types of testing.<br>4d. Test the website | 4.5 Other Testing techniques<br>4.6 Website testing | |
| **Unit-V**<br><br>**Test Documentation** | 5a. Create Test plan<br>5b. Report the defects manually<br>5c. Report the defect using defect tracking system | 5.1 Test Planning: The goal of the test Planning<br>• Test Planning Topics: high level expectations, people, places and things, definitions, Inter group Responsibilities, what will and won't be tested, test phases, test strategy, resource requirements, tester assignments, test schedule, test cases, Metrics and Statistics, Risk and Issues.<br>5.2 Writing and Tracking Test Cases: Test case planning, test design, Test Case, test procedures, test case organization & tracking.<br>5.3 Test Report: A bug's life cycle, Bug tracking system: Manual Bug Reporting and Tracking, Automated bug reporting and tracking. | 08 |
| **Unit-VI**<br><br>**Automation testing and Test tools** | 6a. Differentiate between manual and automation Testing<br><br>6b. identify appropriate type of automation tool according to test requirement | 6.1 The benefits of automation and tools<br>6.2 Test tools: Viewers and Monitors, Drivers, Stubs, Stress and load tools, Interference injectors and noise generators, analysis tools.<br>6.3 Software Test Automation: Macro Recording and playback, programmed macros, Fully Programmable Automated Testing Tools<br>6.4 Testing: Random Testing and Monkey tools<br>6.5 Realities of using test tools and automation. | 08 |
| **TOTAL** | | | **48** |

**5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):**

| Unit No. | Unit Title | Distribution of Theory Marks | | | |
|---|---|---|---|---|---|
| | | **R Level** | **U Level** | **A and above Levels** | **Total Marks** |
| I | Software Testing Background | 04 | 04 | 04 | 12 |
| II | Testing methodologies | 04 | 08 | 04 | 16 |
| III | Code Examination | 04 | 04 | 04 | 12 |
| IV | Types of testing | 04 | 08 | 04 | 16 |
| V | Test Documentation | 04 | 04 | 04 | 12 |
| VI | Automation testing and Test tools | 04 | 04 | 04 | 12 |
| | **TOTAL** | **24** | **32** | **24** | **80** |

**Legends:** R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignment/task should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the desired programme outcome/course outcome.

***Note****: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of* ***Programme Outcomes/Course Outcomes in affective domain*** *as given in the mapping matrix for this course. Faculty should ensure that students also acquire Programme Outcomes/Course Outcomes related to affective domain.*

| S. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Hours |
|---|---|---|---|
| 1 | I | Study any software system specification and design test cases. | 04 |
| 2 | II, V | Design test cases for notepad application | 02 |
| 3 | III, V | Create any GUI application and report bugs. | 04 |
| 4 | IV | Perform testing of any website and report bugs. | 02 |
| 5 | IV | Design test cases for college admission form. | 02 |
| 6 | IV | Design test cases for Social site (Twitter, Facebook) login form. | 02 |
| 7 | II, IV | Write test cases for usability testing of website. | 02 |
| 8 | VI | Automate any web application for Web Testing. (e.g. Selenium). | 04 |
| 9 | VI | Report the bugs using Bug Tracking Tool (e.g. Bugzilla). | 02 |
| 10 | VI | Automate any application for test management tool (e. g. Test Link). | 04 |
| 11 | VI | Automate any Installation Procedure (e.g. WinZip) using Auto IT. | 04 |
| **TOTAL** | | | **32** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Searching various automation testing tools for efficient testing.
2. Handling various open source tools for test management.
3. Handling various open source tools for defect tracking
4. Prepare SRS documents based on case study.
5. Discuss various case studies available on internet
6. Perform testing of own developed software project.

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Arrange a visit to Software Industries for actually observing testing methodologies they are applying.
2. Arrange expert lecture of industry person in the area of Software testing and test automation.

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Software Testing | Ron Patton | PEARSON |
| 2 | Software Testing: Principles and Practices | Srinivasan Desikan Gopalaswamy Ramesh | PEARSON |
| 3 | Software Testing: Principles, Techniques and Tools | M. G. Limaye | Tata McGraw-Hill |

### B) Software/Learning Websites

1. http://en.wikipedia.org/wiki/Test_automation
2. http://en.wikipedia.org/wiki/Software_testing#Testing_tools
3. http://www.softwaretestingsoftware.com
4. http://www.etestinghub.com/
5. http://www.tutorialspoint.com/software_testing/
6. http://www.testingturorials.net/
7. http://www.softwaretestingbuzz.com/

### C) Major Equipment/ Instrument with Broad Specification

| Sr.No. | Equipment | Specification |
|---|---|---|
| 1 | Desktop Computer | PC Specifications to be followed:<br>Processor: i3 or i5<br>RAM: 4 GB or better<br>HDD: 1 TB SATA<br>Monitor: TFT LCD<br>OS: Genuine Windows 8 or 10 Professional or Home Premium or Windows 8 or 10 Ultimate<br>Antivirus: User License for three year |
| 2 | LCD Projector | Display Type: LCD<br>Light Output: 3200 Lumens |
| 3 | Selenium | Web testing tool Freeware |
| 4 | Winrunner | Web testing tool Freeware |
| 5 | Bugzilla | Defect tracking tool |
| 6 | Test link | Test management tool |

## 10.0 MAPPING MATRIX OF PO'S AND CO'S:

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i | j | k |
| CO1 | | H | M | | | | | H | L | | |
| CO2 | | H | M | H | H | | | M | L | | M |
| CO3 | | | L | H | | | | M | L | | M |
| CO4 | | M | L | H | | | | | | | |
| CO5 | | | L | H | | | | | | | |
| CO6 | | H | M | H | | | | | | | L |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME :** Diploma Programme in Information Technology(IF) / Computer Technology(CM)
**COURSE :** Scripting Technology (SPT) **COURSE CODE :** 6439

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 02 | -- | 04 | 06 | -- | Max. | -- | -- | -- | 25 | -- | 25 | 50 |
| | | | | | Min. | -- | -- | -- | 10 | -- | 10 | -- |

## 1.0 RATIONALE:

The scope of internet and Web technology is growing very rapid, as a result it's far crucial to expand the manpower in those regions. The newcomers will be aware about various gear used in dynamic internet page designing and hosting of web sites. This course contains tools for developing client and server side web applications.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Create the program for web application and web communication.
2. Design the HTML programming for client style.
3. Design web applications with server side programming

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Acquires the knowledge basic of scripting languages.
2. Knows the strength, weakness and applicability of scripting language.
3. Develop the dynamic generated web content by using scripting language
4. Build appropriate user interfaces to scripting language.
5. Use built-in scripting function such as math and string.
6. Recognize the problem modeling approach with modularity using functions in scripting.

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Introduction to JavaScript** | 1a. Introduction to Java Script Variables and constants. | 1.1 Using Java Script in HTML pages.<br>1.2 Declaration of Variable and Constant<br>1.3 Private, public Variables and their scopes, Data type Conversion<br>1.4 Declaration, evaluation and Scope of variables<br>1.5 Literals-- Array, Boolean, Floating point, Integer, Object String | 04 |
| **Unit-II**<br><br>**Expressions in Java Script** | 2a. Java Script operator and Expressions. | 2.1 Operators – Assignment, Comparison, Bit wise, logical, string, special<br>2.2 Regular Expressions in JS | 04 |
| **Unit-III**<br><br>**Flow Control Statements in** | 3a. Learn Different conditional and looping statements in Java Script | 3.1 Conditional – If…else, switch<br>3.2 Loop – for, do…while, while, label, break, continue<br>3.3 Object Manipulation – for…in, with | 05 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **JavaScript** | 3b. Explore Exception handling. | Comments<br>3.4 Exception handling – throw, try…catch | |
| **Unit-IV**<br><br>**Functions in JavaScript** | 4a. Explore user Defined and Predefined Function. | 4.1 Using user defined functions<br>4.2 Argument array<br>4.3 Predefined functions – Eval, is Finite, Is Nan, escape, unescape, ParseInt, ParseFloat and other number and string functions | 05 |
| **Unit-V**<br><br>**Introduction to VBScript** | 5a. Introduction to VBScript Variable | 5.1 Private, public their scopes<br>5.2 Data type Conversion<br>5.3 Declaration, evaluation and scope of variables | 04 |
| **Unit-VI**<br><br>**Flow Control Statements In VBScript** | 6a. VBScript Conditional and looping statements | 6.1 Conditional – If…else, Select<br>6.2 Looping – for, do…while, while<br>6.3 Object Manipulation – for each…in. | 04 |
| **Unit-VII**<br><br>**VBScript Build in functions** | 7a. Explore Build in functions of VBScript | 7.1 Built in Functions<br>• Date/Time Functions<br>• Conversion Functions<br>• Format function<br>• Mathematical function<br>• Array function<br>• String Functions<br>7.2 User Defined Functions | 06 |
| | | **TOTAL** | **32** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

**Legends:** R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

***Note**: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

| Sr. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. required |
|---|---|---|---|
| 1 | I, | Write a JavaScript to create webpage | 06 |
| 2 | II | Write a JavaScript to implement different types of operators | 06 |

| Sr. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. required |
|---|---|---|---|
| 3 | II | Write a JavaScript to implement various conditional statements | 06 |
| 4 | II | Write a JavaScript to implement various looping statements | 06 |
| 5 | III | Write a JavaScript to implement concept of built in functions and user defined functions | 08 |
| 6 | IV | Write a VBScript to assignment on creation of webpage | 06 |
| 7 | V | Write a VBScript to implement different types of operators | 06 |
| 8 | VI | Write a VBScript to implement various conditional statements | 08 |
| 9 | VI | Write a VBScript to implement various looping statements | 06 |
| 10 | VII | Write a VBScript to implement concept of built in functions and user defined functions | 06 |
| | | **TOTAL** | **64** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Prepare a mini project by using scripting concepts.

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Demo lectures with power point presentations using LCD projector should be arranged to develop

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Teach yourself JavaScript in 21 days | Michael Moncur | Techmedia |
| 2 | JavaScript Step by Step | Steave Stuhring | O'Reilly Media |
| 3 | Learning JavaScript | Shelley Powers | O'Reilly Media |
| 4 | JavaScript, A Beginner's Guide Third Edition | John Pollock | McGraw Hill |
| 5 | VBSCript Programmer reference | Adrian KingSLEY Danial Read | WROX |
| 6 | VBSript a Beginner Guide | Jyoti Giramankar | Create Space |
| 7 | VBScript in a nutsheel | Matchilds RON | O'Reilly Media |

### B) Software/Learning Websites

1. www.w3school.com/
2. www.javatpoint.com

### C) Major Equipment/ Instrument with Broad Specifications

1. Hardware: Desktop Computer P-IV processor or higher
2. Software: Web Brower, Notepad, C++, Sublime Text.

## 10.0 MAPPING MATRIX OF PO'S AND CO'S:

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i | j | k |
| CO1 | M | H | | | | | M | | | | |
| CO2 | | H | H | | | L | | | | | |
| CO3 | | M | | L | L | | | | L | | H |
| CO4 | | H | | | L | M | M | L | | | M |
| CO5 | L | H | M | | | | | | | | |
| CO6 | | H | H | | | H | | | | L | M |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME** : Diploma Programme in Computer Technology (CM)
**COURSE** : System Software(SSW) **COURSE CODE** : 6440

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 03 | -- | -- | 03 | 03 | Max. | 80 | 20 | 100 | -- | -- | -- | 100 |
| | | | | | Min. | 32 | -- | 40 | -- | -- | -- | -- |

## 1.0 RATIONALE:

The System software is the collection of programs that bridge the gap between the users and the operating system. The main aim of System software course is to introduce designing and implementation of software's like assemblers, loaders and compilers. Using system software students will have an idea about how the system tools coordinates with operating system.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Identify the need of System Software in computer system.
2. Describe the working of various System Software
3. Gain insight into design of Assembler, Macro processor, Compiler, Linker and Loader.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Recognize need of System software.
2. Identify location and working of System Software in computer system.
3. Gain insight into design of Assembler and assembly language processing.
4. Gain insight into design of Macro processor.
5. Describe the use of Linker and Loaders.
6. Gain insight into design of Compiler.

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**System software Basics** | 1a. Recognize need of system softwares in computer system<br>1b. Identify components of System Software | 1.1 Softwares: Application and System Softwares<br>1.2 System Software: Need of system software, Definition<br>1.3 Evolution of System Softwares and Operating System<br>1.4 Components of System Software<br>1.5 Evolution of programming languages<br>1.6 Fundamentals of language processing activities: Analysis and Synthesis phase<br>1.7 Types of Special System Software | 08 |
| **Unit-II**<br><br>**Assembler** | 2a. Introduce Single pass and Two-Pass assembler.<br>2b. Gain insight into the general assembly scheme. | 2.1 Basics of assembly language: Assembly language statements, Statement format, Simple set of instructions<br>2.2 Types of assembly language statements<br>2.3 Assembler<br>2.4 Design of assembler<br>• Problem Statement<br>• Databases Required for designing of | 08 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | | assembler<br>• Pass Structure of assembler<br>• Pass I of assembler: Working, Algorithm<br>• Pass II of assembler: Working, Algorithm | |
| **Unit-III**<br><br>**Macro processor** | 3a. Comprehend the definition and expansion of macros Instructions<br>3b. Gain insight into design of macro preprocessor | 3.1 Macro: Definition, Structure of macro instruction<br>3.2 Features of Macro:<br>• Macro Instruction Argument<br>• Conditional Macro Expansion<br>• Macro Call within Macro<br>• Macro Instructions Defining Macro<br>3.3 Macro Processor<br>3.4 Design of Macro processor:<br>• Basic task performed by Macro processor<br>• Two pass algorithm for macro processor<br>• Databases required for designing of Macro processor | 08 |
| **Unit-IV**<br><br>**Linkers and Loaders** | 4a. Describe the concepts and requirements of loading and linking.<br>4b. Identify suitable loading scheme.<br>4c. Differentiate various types of loaders. | 4.1 Linking<br>4.2 Loading<br>4.3 Relocation<br>4.4 Loader Schemes: Compile and Go Loader, General Loader, Absolute Loader, Subroutine Linkage, Relocating Loader, Direct linking loader.<br>4.5 Dynamic linking<br>4.6 Dynamic Loading<br>4.7 Overlay Structure | 08 |
| **Unit-V**<br><br>**Compiler** | 5a. Describe the concepts of compiler.<br>5b. Divide the process of Compilation among the various phases.<br>5c. Differentiate compiler and Interpreter | 5.1 Compiler<br>5.2 Phases of compiler: Lexical Analysis, Syntax Analysis, Semantic Analysis, Intermediate Code Generation, Code Optimization, Code Generation<br>5.3 Interpreter<br>5.4 Difference between Compiler and Interpreter.<br>5.5 Compiler design option<br>• Bootstrap Compiler<br>• Cross Compiler<br>• Compiler-Compiler<br>• Incremental Compiler | 08 |
| | | **TOTAL** | **48** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

| Unit No. | Unit Title | Distribution of Theory Marks | | | |
|---|---|---|---|---|---|
| | | R Level | U Level | A and above Levels | Total Marks |
| I | System Software Basics | 04 | 04 | 04 | 12 |
| II | Assembler | 04 | 04 | 08 | 16 |
| III | Macro Processor | 04 | 08 | 04 | 16 |
| IV | Linkers and Loaders | 04 | 04 | 08 | 16 |
| V | Compiler | 04 | 08 | 08 | 20 |
| | **TOTAL** | **20** | **28** | **32** | **80** |

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

Not Applicable

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Gain insight into various design aspects of the system software.
2. Use different software tools like editor and debuggers.

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Teach procedures for the design of system software like assembler, macro processor etc.

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 01 | System Programming | John J. Donovan | Tata McGraw-Hill Edition |
| 02 | System Programming and Operating System | D.M. Dhamdhere | Tata McGraw-Hill Edition |

### B) Software/Learning Websites

1. http://www.jan.newmarch.name/ssw/tutorials.html
2. http://www.v-1rn.com/system-software/406

### C) Major Equipment/ Instrument with Broad Specifications

| Sr.No. | Equipment/ Instrument | Specification |
|---|---|---|
| 1 | Desktop Computer | PC Specifications to be followed:<br>Processor: i3 or i5<br>RAM: 4 GB or better<br>HDD: 1 TB SATA<br>Monitor: TFT LCD<br>OS: Genuine Windows 8 or 10 Professional or Home Premium or Windows 8 or 10 Ultimate<br>Antivirus: User License for three year |
| 2 | LCD Projector | Display Type: LCD<br>Light Output: 3200 Lumens |

## 10.0 MAPPING MATRIX OF PO'S AND CO'S:

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i | j | k |
| CO1 | | H | H | M | M | | | L | | | |
| CO2 | | H | H | M | | | | L | | | H |
| CO3 | | H | H | H | L | | | M | | | H |
| CO4 | | H | H | H | L | | | M | | | H |
| CO5 | | H | H | H | | | | M | | | H |
| CO6 | | H | H | H | L | | | M | | | H |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME :** Diploma Programme in Information Technology(IF) / Computer Technology(CM)
**COURSE :** Object Oriented Modeling and Design (OOM) **COURSE CODE :** 6537

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 03 | -- | 02 | 05 | 03 | Max. | 80 | 20 | 100 | -- | 25 | 25 | 150 |
| | | | | | Min. | 32 | -- | 40 | -- | 10 | 10 | -- |

## 1.0 RATIONALE:

Modelling plays an important role in software development. Real world scenario like customers requirements are mapped to the models for an implementation. This course presents an object oriented approach to software development. The graphical notation described in courses helps the software developer to visualize a problem before going for implementation.

This course will be useful for the student to understand the concepts of Object Oriented Programming System and to model these concepts using UML for any application, before actually going for coding part.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Interpret the meaning of object oriented concepts and Object modelling technology.
2. Apply an object model and draw basic class diagrams for a given problem statement.
3. Create custom UML profile to accurately model different system domains.
4. Draw sequence, activity and state diagram for given problem statement.
5. Design the components, deployment modules for software.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Handle anyone design tool like rational rose to draw the diagrams.
2. Capture the high level requirement into modeling concepts.
3. Design basic use case and class diagram by identifying user's needs.
4. Draw the sequence of information flow, states of systems.
5. Visualize the architectural view of software for better understand to the customers.

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Importance of Modelling** | 1a. Describe the basic concepts object oriented themes and technology.<br>1b. Apply the use case driven approach and CRC card method. | 1.1 Object Orientation.<br>1.2 OOM Themes: Abstraction, Encapsulation, Combining data and Behavior.<br>1.3 Brief overview of Object Modelling Technology (OMT) by Ram Baugh, Booch Methodology.<br>1.4 Use Case driven approach (OOSE) by Jacobson<br>1.5 Overview of CRC card method by Cunningham. | 10 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-II**<br><br>**Object Modelling** | 2a. Identify the relationship between multiplicity, aggregation and object modelling.<br>2b. Applying link and association concept in class diagram.<br>2c. Designing the object models. | 2.1 Object and Class Concepts:<br>• Objects, Classes, Basic Class Diagrams.<br>• Values and Attributes.<br>• Operations and Methods.<br>• Link and Association concepts: Links and Associations, Multiplicity, Association and Names, Ordering, Association Classes, Qualified Association<br>• Generalization and Inheritance : Use of Generalization, Sample Class Model<br>2.2 Multiplicity, Aggregation and Object Modelling.<br>• Multiplicity, Aggregation.<br>• Aggregation Versus Association<br>• Propagation of operations<br>• Multiple Inheritance, Metadata and Constraints-Metadata, Constraints on objects and links<br>• Object modelling<br>• Object instances<br>• Sample Object Model. | 08 |
| **Unit-III**<br><br>**Basic Behavioral Modelling** | 3a. Interpret scope of UML diagram.<br>3b. Draw use case diagram.<br>3c. Draw advance Class diagrams, object diagram and identify relationship between classes. | 3.1 OMG, approval for UML, Scope of UML, Introduction to UML Diagrams.<br>3.2 Use case Diagram<br>• Notations for Use case diagram : use cases, Actors, Communication lines, System boundaries<br>• Use case relationships : Include and extend, Use case generalization<br>• Sample use case diagrams<br>3.3 Advanced Class Diagrams: Advanced Classes and Relationships, Interfaces, Types and Roles, Packages, Instances. Object Diagrams. | 12 |
| **Unit-IV**<br><br>**Advanced Behavioral Modelling** | 4a. Draw the Sequence Diagrams.<br>4b. Draw the Activity Diagram.<br>4c. Draw the State Diagram. | 4.1 Sequence Diagrams<br>• Notations for Sequence diagram: Objects / Participants, Time, events, Activation Bars, signals, message arrows, synchronous and asynchronous messages, return message, create and destroy message<br>• Structured control :optional, conditional, parallel, loop execution<br>• Sample sequence diagrams.<br>4.2 Activity Diagram<br>• Notations for Activity Diagram : Actions and Activity nodes,<br>• initialization and completion, Decisions, Join and fork<br>• Doing multiple tasks at the same time: Swim lanes | 10 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | | • Sample Activity Diagram<br>4.3 State Diagram<br>• Notations for State diagram - initial state, final state, transitions and conditions, activity, event,<br>• Nested state diagram, concurrent / composite state diagram<br>• Sample state diagram. | |
| **Unit-V**<br><br>**Architectural modelling** | 5a. Draw the Component Diagram<br>5b. Draw the Deployment diagram. | 5.1 Component Diagram<br>• Notations for component Diagram : component and interfaces, ports, connectors.<br>• Sample Component Diagram<br>5.2 Deployment Diagram<br>• Notations for Deployment diagram : nodes, artifacts, node<br>• Instances, communication between nodes.<br>• Sample Deployment diagram. | 08 |
| **TOTAL** | | | **48** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

| Unit No. | Unit Title | Distribution of Theory Marks | | | |
|---|---|---|---|---|---|
| | | R Level | U Level | A and above Levels | Total Marks |
| I | Importance of Modeling. | 06 | 04 | 06 | 16 |
| II | Object Modeling | 06 | 04 | 08 | 18 |
| III | Basic Behavioral Modeling | 06 | 04 | 06 | 16 |
| IV | Advanced Behavioral Modeling | 08 | 04 | 04 | 16 |
| V | Architectural modeling | 06 | 06 | 02 | 14 |
| | **TOTAL** | **32** | **22** | **26** | **80** |

**Legends:** R = Remembrance (Knowledge); U= Understanding; A= Application and above levels (Revised Bloom's taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

***Note****: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of* ***Programme Outcomes/Course Outcomes in affective domain*** *as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

| S. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. Required |
|---|---|---|---|
| 1 | I | Study of Object oriented modelling concept. | 02 |
| 2 | II | Draw object and class diagram. | 04 |
| 3 | III | Draw use case diagram. | 02 |
| 4 | III | Draw advance class diagram. | 04 |
| 5 | IV | Draw sequence diagram. | 04 |
| 6 | IV | Draw activity diagram | 04 |
| 7 | IV | Draw state diagram. | 04 |
| 8 | V | Draw component diagram. | 02 |
| 9 | V | Draw deployment diagram. | 02 |
| 10 | V | Mini project | 04 |
| | | **TOTAL** | **32** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Draw UML diagram as a MINIPROJECT for management system
   a. Library management system
   b. College management
2. Visualize any 10 UML diagram using rational rose tool as well as draw on a paper.

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Showing previous project reports to students for UML ideas.
2. Gather SRS from clients and draw structural, behavioral and architectural models with respect to it.

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Object oriented modelling and design with UML 2.0 (second edition) | Blaha and Rumbaugh | Pearson |
| 2 | The unified modelling language user guide (second edition) | Booch, Rumbaugh, Jacobson | Pearson education |
| 3 | Learning UML 2.0 | Miles and Hamilton | SPD O'REILLY |

### B) Software/Learning Websites

1. http://www.iknowledgebase.wikispace.com
2. http://uml-tutorials.trireme.com/
3. http://www.uml-diagrams.org/index-examples.html (refer for case studies)
4. http://www.tutorialspoint.com/uml/uml_class_diagram.htm

**C) Major Equipment/ Instrument with Broad Specifications**

| Sr.No. | Equipment | Specification |
|---|---|---|
| 1 | Desktop Computer | PC Specifications to be followed:<br>Processor: i3 or i5<br>RAM: 4 GB or better<br>HDD: 1 TB SATA<br>Monitor: TFT LCD<br>OS: Genuine Windows 8 or 10 Professional or Home Premium or Windows 8 or 10 Ultimate<br>Antivirus: User License for three year |
| 2 | LCD Projector | Display Type: LCD<br>Light Output: 3200 Lumens |
| 3 | Rational Rose Software | License |

**10.0 MAPPING MATRIX OF PO'S AND CO'S:**

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **a** | **b** | **c** | **d** | **e** | **f** | **g** | **h** | **i** | **j** | **k** |
| CO1 | | M | | M | | L | | H | L | H | |
| CO2 | | M | | | M | | | M | H | H | M |
| CO3 | | H | | M | M | L | | M | H | H | |
| CO4 | | H | | M | M | L | | M | H | H | M |
| CO5 | | H | | M | M | L | | M | H | H | M |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME :** Diploma Programme in Information Technology(IF) / Computer Technology(CM)
**COURSE :** Advance Database Management (ADM) **COURSE CODE :** 6539

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 03 | -- | 02 | 05 | 03 | Max. | 80 | 20 | 100 | -- | 25 | 25 | 150 |
| | | | | | Min. | 32 | -- | 40 | -- | 10 | 10 | -- |

## 1.0 RATIONALE:

This course is associated with the designing of database for business, scientific and engineering application. By the end of this course the students will be able to write simple and advanced PL/SQL code blocks, use advanced features such as ref cursors and bulk fetches and database designing with normalization. Hence students will be able to design relational database which will help them in designing phase of projects in forthcoming semester.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Discriminate different database concepts.
2. Memorize Oracle architecture with its components.
3. Create, design and build queries and using Oracle 10g express edition
4. Develop Dynamic web application with database interaction (Specifically Java Programming Language)
5. Experiments with handling data collection with reliability and management of data with transformation in a secure environment
6. Demonstrate the Network configuration between the database clients and servers. As well make use of Database backup and recovery.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Recognize the importance of DBMS effectiveness. As well demonstrate installation and use of oracle
2. Making use of Oracle Objects, Managing User. As well work with Table Space. Using System Privileges for Database Security
3. Comprehend the concept, importance, need of database recovery with various recovery techniques
4. Analyze and distinguish the Emerging Database Technologies and integrate database for dynamic Web Application Development
5. Describe, Summarizing and Recognize various Oracle Networking and performance tuning

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Introduction to DBMS and Oracle** | 1a. DBMS Introduction<br>1b. Oracle database architecture<br>1c. Introduction to concept of SGA and PGA<br>1d. Oracle Control file | 1.1 Definition of DBMS<br>1.2 Benefits of DBMS<br>1.3 Introduction to Database system, Overview of parallel DBMS, Distributed DBMS, Advantages of Distributed DBMS<br>1.4 Oracle database architecture Logical structure, Physical structure<br>1.5 System Global Area (SGA) Database | 10 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | 1e. Oracle instance | buffers cache, Redo log buffer, Shared pool<br>1.6 Program Global Area (PGA) Background processes, System Monitor (SMON), Processes Monitor(PMON), Database Writer(DBWR), Log Writer(LGWR), ARCHiver<br>1.7 Maintaining Control file. Use of control file, Control file, Multiplex and manage the Control file, manage control file with oracle managed files.<br>1.8 Managing an Oracle Instance. Create and manage Initialization parameter files, configure OMF, startup & shutdown an instance, monitor the use of diagnostic files | |
| **Unit-II**<br><br>**Managing User, Objects, TableSpace and DB Security** | 2a. To understand how to manage the users.<br>2b. To understand Managing Table Space<br>2c. Database Security:<br>• To use the system privileges.<br>• To use Revoking Privileges given. | 2.1 Managing user in oracle, Privileges, System Privileges, Object Privileges, Granting Privileges, Granting Privileges when Grantee has been given GRANT Privilege, Revoking Privileges Given, Revoking Permissions Using the REVOKE Statement, Roles Modifying Existing User password, create and modify roles, Control availability of roles, remove roles, user predefined roles, display role information from the data Dictionary, Creating A DBA User.<br>2.2 Creating table spaces, Table spaces, Oracle system table space, Create table space, Creating a table space using SQL plus creating regular and temporary tables, manage storage structures within a table, reorganize truncate, drop a table, purpose of undo data, automatic undo management different types of indexes and their uses creating, reorganizing and dropping indexes, get index, Information from the data dictionary.<br>2.3 Database Security, Goals of Database Security, Threats to Database Security, Types of Database Security Issues: Discretionary Access Control, Granting & Revoking Privileges, Audit Trail, Mandatory Access Control | 10 |
| **Unit-III**<br><br>**Database Backup and Recovery** | 3a. To understand Database Backup concept with its important<br>3b. Basics of Recovery<br>3c. Understand Recovery | 3.1 Introduction<br>3.2 Database backup<br>3.3 Why plan backup?<br>3.4 Transaction logs<br>3.5 Importance of backup<br>3.6 Backup mechanism, Logging, Check points<br>3.7 Database Recovery concepts and | 09 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | Techniques | terminology<br>3.8 Data storage<br>3.9 Causes of failure<br>3.10 Recovery Techniques: Deferred update, Immediate update, Shadow paging<br>3.11 Instance and media recovery structures, Oracle processes, memory structures and files related to recovery, importance of check points, redo log files and archived log files, instance recovery. Oracle recovery manager overview and configuration. RMAN features, components, configuring RMAN. | |
| **Unit-IV**<br><br>**Emerging Database Technologies and Application Development** | 4a. Understanding Internet Database<br>4b. Multimedia database<br>4c. Mobile Database<br>4d. Understand client server architecture, two tier and three tier architecture | 4.1 Internet Databases, Internet technology, World Wide Web technology, Advantages and disadvantages of web databases<br>4.2 Multimedia Databases, Multimedia sources, Multimedia database queries, Multimedia database applications<br>4.3 Mobile databases, Architecture of mobile databases, Characteristics of mobile computing, Mobile DBMS, Commercial mobile databases<br>4.4 Client - Server Architecture Partitioning on application<br>4.5 Database in a two tier architecture<br>4.6 Key consideration in three tier applications and its Benefits | 10 |
| **Unit-V**<br><br>**Overview of Oracle Networking and performance tuning** | 5a. Overview of oracle networking<br>5b. Oracle database Performance tuning | 5.1 Networking overview and basic oracle net architecture with its components.<br>5.2 Tuning application design, tuning SQL, tuning memory usage, tuning data access, tuning data manipulation, tuning physical storage, reducing network traffic, using STATSPACK and the automatic work load repository, using STATSPAC tuning tools, alert log, background trace file, server generated alerts, user trace files. | 09 |
| **TOTAL** | | | **48** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

| Unit No. | Unit Title | Distribution of Theory Marks | | | |
|---|---|---|---|---|---|
| | | R Level | U Level | A and above Levels | Total Marks |
| I | Introduction to DBMS and Oracle | 04 | 06 | 04 | 14 |
| II | Managing User, Objects, Table Space and DB Security | 04 | 04 | 12 | 20 |
| III | Database Backup and Recovery | 06 | 06 | 08 | 20 |
| IV | Emerging Database Technologies and Application Development | 08 | 04 | 02 | 14 |
| V | Overview of Oracle Networking and performance | 08 | 02 | 02 | 12 |

| Unit No. | Unit Title | Distribution of Theory Marks | | | |
|---|---|---|---|---|---|
| | | R Level | U Level | A and above Levels | Total Marks |
| | tuning | | | | |
| | **TOTAL** | **30** | **22** | **28** | **80** |

**Legends:** R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

***Note****: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of* ***Programme Outcomes/Course Outcomes in affective domain*** *as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

| S. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. required |
|---|---|---|---|
| 1 | I | Demonstration of Installation of Oracle Database Softwares. | 02 |
| 2 | I | Create a database with database configuration assistant. | 02 |
| 3 | II | Use enterprise manager to grant system and manage database user. | 03 |
| 4 | II | Use enterprise manager to grant system and object privileges. | 03 |
| 5 | II | Use enterprise manager to create alter and drop a table space | 04 |
| 6 | II | Use enterprise manager to create and manage roles and profiles | 04 |
| 7 | II | Create database objects and constraints using enterprise manager. | 03 |
| 8 | III | Run a whole database backup and back up the control file to trace with SQL plus and manage RMAN backups. | 04 |
| 9 | IV | Implementation of accessing database from a java program. Demonstrate application of dynamic web page. | 04 |
| 10 | V | Demonstrate a listener with database control, oracle net service alias and configure dynamic service registration. | 03 |
| **TOTAL** | | | **32** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Show demonstration of Set a listener password with lsnrctl and creating a listener for external procedural calls
2. Study the RMAN with Configuration of RMAN and Create backup sets using RMAN and managing backups
3. Mini Project on any other topic.(Use Java to implement front end of Application )

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Arrange expert lecture on Advance database technique, tools and security and its challenges
2. Prepare case study on Database security technique and database backup

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Oracle for Professionals | Sharnam Shah, Vaishali Shah | SPD |
| 2 | Modern Database Management | Jeffery A. Hoffer<br>V. Ramash, Heikki Topi | Pearson |
| 3 | Database Systems | Shio Kumar Singh | Pearson |
| 4 | Oracle Database 11g DBA Handbook | Bob Bryla, Kevin Loney | Oracle Press |
| 5 | Oracle Database 11g OCP Certification All in one Exam | John Watson, Damir Bersinic | McGraw-Hill |

### B) Software/Learning Websites

1. http://www.oracle.com/technetwork/tutorials/index.html
2. http://www.oracle.com/technetwork/testcontent/index-091166.html
3. www.javacoffeebreak.com/articles/jdbc
4. http://www.tutorialspoint.com/listtutorials/oracle/1

### C) Major Equipment/ Instrument with Broad Specifications

| Sr.No. | Equipment | Specification |
|---|---|---|
| 1 | Desktop Computer | PC Specifications to be followed:<br>Processor: i3 or i5<br>RAM: 4 GB or better<br>HDD: 1 TB SATA Graphics Card: 2 GB<br>Monitor: TFT LCD<br>OS: Genuine Windows 8 or 10 Professional or Home Premium or Windows 8 or 10 Ultimate Multimedia Keyboard, Speaker<br>Antivirus: User License for three year |
| 2 | LCD Projector | Display Type: LCD<br>Light Output: 3200 Lumens |
| 3 | Oracle | Oracle 10 G 11G or Higher |

## 10.0 MAPPING MATRIX OF PO'S AND CO'S:

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i | j | k |
| CO1 | H | H | M | H | | | | M | | M | M |
| CO2 | M | M | M | M | | | M | | L | | M |
| CO3 | H | M | M | | | | | | | M | M |
| CO4 | H | M | M | M | M | M | L | L | L | M | M |
| CO5 | M | M | M | M | M | M | M | M | | M | M |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME :** Diploma Programme in Information Technology(IF) / Computer Technology(CM)
**COURSE :** ASP.NET Technology (ASP) **COURSE CODE :** 6540

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 03 | -- | 04 | 07 | 03 | Max. | 80 | 20 | 100 | -- | 25 | 25 | 150 |
| | | | | | Min. | 32 | -- | 40 | -- | 10 | 10 | -- |

**1.0 RATIONALE:**

The primary objective of this course is to developed server-side web applications using.NET platform. It is essential to get hands on experience for developing internet applications. This will help students to acquire skills and attitude to work as web developer.

**2.0 COURSE OBJECTIVES:**

The student will be able to,

1. Understand and Explain features of server side scripting.
2. Explain ASP components and directives.
3. Develop database applications.
4. Develop dynamic web pages.
5. Understand ADO.NET and Manipulation.

**3.0 COURSE OUTCOMES:**

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Understand and Explain features of server side scripting.
2. Understand Asp Process, functions and Built-in ASP Objects
3. Indentify and use ASP components and directives for application development.
4. Use IIS for application development with.NET IDE
5. Develop stand alone and web applications with database interactivity
6. Develop dynamic web pages using built-in ASP objects and controls.
7. Understand and use ADO.NET and its Manipulation.

**4.0 COURSE DETAILS:**

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Introduction to ASP** | 1a. ASP Process Model<br>1b. Function in ASP<br>1c. ASP objects | 1.1 Process Model of ASP<br>1.2 Different function in ASP<br>1.3 ASP objects --response, request, application, session, server, object context & other | 06 |
| **Unit-II**<br><br>**ASP Components and directives** | 2a. Global.asa file<br>2b. Lcid property<br>2c. Components<br>2d. Directives<br>2e. Transaction | 2.1 Global.asa file.<br>2.2 Server side includes code page, enable sessions, language, lcid, transaction.<br>2.3 Components --Ad rotator, browser capabilities, content rotator, page counter, counters.<br>2.4 Directives --config, echo, exec, flastmod, fsize, include<br>2.5 ASP Transaction & Email: | 06 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | | Transaction, Transactions Database Design, Email Sending, Web Page Creation | |
| **Unit-III**<br><br>**Accessing Database** | 3a. ADO objects<br>3b. Forms<br>3c. Database Operations<br>3d. OLE | 3.1 ADO object--connection, command, record set.<br>3.2 HTML forms & posting of data to server<br>3.3 Adding, Retrieving and updating data in database<br>3.4 OLE DB providers with ADO | 08 |
| **Unit-IV**<br><br>**Introduction to ASP.NET** | 4a. Introduction<br>4b. Architecture<br>4c. IIS<br>4d. IDE<br>4e. HTML Forms<br>4f. Controls | 4.1 introduction to.NET Framework, Difference between ASP and ASP.NET<br>4.2 .NET Architecture<br>4.3 Introduction to IIS, What is web application? Why it is used?<br>4.4 ASP.NET IDE.<br>4.5 Creation of web forms.<br>4.6 Using web form controls. | 08 |
| **Unit-V**<br><br>**ASP.NET objects and components** | 5a. ASP Objects<br>5b. scope<br>5c. object creation<br>5d. server components<br>5e. global.asa file<br>5f. application object<br>5g. Events<br>5h. Method and collection<br>5i. session object<br>5j. properties | 5.1 ASP Objects<br>• Request<br>• Response.<br>• Server.<br>• Application.<br>• Session.<br>5.2 ASP.NET scope, state, view state, post back and configuration.<br>5.3 Object creation: Scripting, Drive, folder, file.<br>• How to use objects?<br>5.4 Server components: Ad rotator, Content linker, Browser<br>5.5 Capabilities.<br>5.6 Use and creation of global.asa file.<br>5.7 How to use Application object?<br>5.8 Events<br>5.9 Methods and collection<br>5.10 How to use session object: enabling and disabling of session.<br>5.11 Event, properties, methods, collection | 12 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-VI**<br><br>**ADO.NET & Data Manipulation** | 6a. ADO.NET in ASP.NET<br>6b. Server control | 6.1 ADO.NET in ASP.NET<br>• Connection.<br>• Dataset and data reader.<br>• Data table and Data row.<br>• Web config introduction.<br>• Binding data with data grid.<br>• Accessing and manipulating data.<br>6.2 ADO.NET: Server control templates and Data binding techniques<br>• Understand data access in.net using ADO.net<br>• Understand various Server Control Templates available for<br>6.3 Data Binding like Repeater.<br>• Data List and Data Grid Controls.<br>• Detail View Control, Form View Control, Grid Controls. | 08 |
| **TOTAL** | | | **48** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

| Unit No. | Unit Title | Distribution of Theory Marks | | | |
|---|---|---|---|---|---|
| | | R Level | U Level | A and above Levels | Total Marks |
| I | Introduction to ASP | 04 | 04 | 02 | 10 |
| II | ASP Components and directives | 04 | 04 | 02 | 10 |
| III | Accessing Database | 02 | 04 | 06 | 12 |
| IV | Introduction to ASP. Net | 04 | 02 | 02 | 08 |
| V | ASP.NET objects and components | 06 | 06 | 08 | 20 |
| VI | ADO.NET & data manipulation | 06 | 06 | 08 | 20 |
| | **TOTAL** | **26** | **26** | **28** | **80** |

**Legends:** R = Remembrance (Knowledge); U= Understanding; A= Application and above levels (Revised Bloom's taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

***Note**: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

| S. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. Required |
|---|---|---|---|
| 1 | I, II | Create a student registration form. print the data by using the Response and request object | 08 |
| 2 | I, II | Write a program to implement concept of session object. | 04 |
| 3 | II | Write a program to use server side includes | 04 |
| 4 | III | Write a program to make database connectivity in ASP | 04 |
| 5 | II, III | Design login form with validation in ASP | 04 |
| 6 | VI | Study of.NET framework | 04 |
| 7 | V | Design Registration form with validation of email address, date of birth, blank field, telephones and mobile numbers etc in.NET | 08 |
| 8 | V | Design mark sheet of student in the.NET frame work Application which sends email. | 08 |
| 9 | V | Application which sends emails. | 04 |
| 10 | VI | Using AD rotator create the advertisement | 04 |
| 11 | I to VI | Mini Project – Create project using Forms & Database connectivity And implement the<br>Project in LAN successfully with each desktop.<br>Steps -.NET Framework Installation<br>IIS Installation<br>Publish Web Application | 12 |
| | | **TOTAL** | **64** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Discuss asp.NET and similar technology available.
2. Prepare seminars on various topics ASP.NET.

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Concept will be introduced in lectures using charts or ppt.
2. Arrange expert seminar of industry person in the area of web development
3. Developed mini project in practical sessions under the guidance of teacher.

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | ASP.NET | Dave Mercer | Tata Mc Grow Hill |
| 2 | .NET Framework | Anthony Jones | Tata Mc Grow Hill |
| 3 | .NET Framework Essential | Thwan Thai, Hoang Lan | Oreilly |

### B) Software/Learning Websites

1. http://www.w3schools.com/aspnet/
2. http://www.tutorialspoint.com/asp.net/
3. http://www.asp.net/get-started

**C) Major Equipment/ Instrument with Broad Specifications**

| Sr.No. | Equipment | Specification |
|---|---|---|
| 1 | Desktop Computer | PC Specifications to be followed:<br>Processor: i3 or i5<br>RAM: 4 GB or better<br>HDD: 1 TB SATA<br>Monitor: TFT LCD<br>OS: Genuine Windows 8 or 10 Professional or Home Premium or Windows 8 or 10 Ultimate<br>Antivirus: User License for three year |
| 2 | LCD Projector | Display Type: LCD<br>Light Output: 3200 Lumens |

**10.0 MAPPING MATRIX OF PO'S AND CO'S:**

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **a** | **b** | **c** | **d** | **e** | **f** | **g** | **h** | **i** | **j** | **K** |
| CO1 | L | H | H | M | | | M | | | | |
| CO2 | | | H | M | | | L | M | | M | |
| CO3 | | H | | L | L | | | | | | |
| CO4 | | | M | | | L | | | | | |
| CO5 | | H | H | M | | | H | H | | H | |
| CO6 | | M | H | H | | | | M | | L | L |
| CO7 | | M | H | H | | | | M | | L | L |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME :** Diploma Programme in Information Technology(IF) / Computer Technology(CM)
**COURSE :** PHP Programming (PHP) **COURSE CODE :** 6541

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 03 | -- | 04 | 07 | 03 | Max. | 80 | 20 | 100 | -- | 25 | 25 | 150 |
| | | | | | Min. | 32 | -- | 40 | -- | 10 | 10 | -- |

## 1.0 RATIONALE:

The course of PHP programming has been developed to facilitate acquisition of the open source programming language required in IT industry today. The course aims to improve the understanding of Open source programming language, Software and web application development. The program provides the requisite awareness and knowledge to understand key concepts that can be applied to IT projects focusing on Services provided by web application.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Describe the concepts of constants, variables, data types and operators
2. Develop programs using input and output operations
3. Develop program using different looping and branching statements.
4. Code & maintain small PHP web based applications
5. Introduce power of relational databases using MySQL
6. Examining the various aspects of security, from securing server, database server

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Knows the process of executing a PHP-based script on a web server.
2. Acquire the basic knowledge of PHP syntax for variable use and standard
3. Language constructs, such as conditionals and loops.
4. State the syntax and use of PHP object-oriented classes
5. Develop a form containing several fields and be able to process the data
6. Provided on the form by a user in a PHP-based script.
7. Demonstrate the functions available to deal with file processing for files on the
8. Server as well as processing web URLs.
9. Utilize the power of relational databases using MySQL.
10. Illustrate the various aspects of security, from securing server, database.

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**PHP Fundamentals** | 1a. Introduction to PHP<br>1b. PHP programming basics<br>1c. Recall operators and control flow statements | 1.1 Introduction to PHP--Concept, PHP--Evolution<br>1.2 PHP Vs. Other Scripting Languages, PHP vs. ASP, PHP vs. JAVA, PHP vs. Perl.<br>1.3 PHP Installation--Operating System, Module or CGI, Web Server<br>1.4 PHP Program Basic-- File Basics, Statements, comments, Literals | 06 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | | 1.5 Data Types, Variables, Constants, Scope of Variable.<br>1.6 Operators & Functions—General operations, String operations, String functions, Numeric operations--Bitwise, comparison, Logical operators, operator Precedence.<br>1.7 Program Flow Control, Structures, Conditional Statements--if, if--else, if--else ladder | |
| **Unit-II**<br><br>**Arrays and Functions** | 2a. Introduction to array and string function.<br>2b. Concept of Function. | 2.1 Arrays: One Dimensional Arrays, Multidimensional Arrays, Initializing Arrays, Handling Array with Loops, PHP Array Function.<br>2.2 Strings: String Function, Converting to String, Converting from String, Formatting Text Strings.<br>2.3 Functions Types: User Defined, Passed by Value, Passed by Reference. Built In Function, Variable Lifetime, Recursion | 06 |
| **Unit-III**<br><br>**OOP with PHP** | 3a. Necessity of Oops approach with Basic terminologies<br>3b. Data security. | 3.1 OOPS approach with PHP, Classes and Objects, Encapsulation, Inheritance, Polymorphism, Cohesion & Coupling<br>3.2 Access to Properties & Methods, Public Access, Private Access, Protected Access | 06 |
| **Unit-IV**<br><br>**User input & Regular Expressions** | 4a. Need of HTML forms<br>4b. Concept of Regular Expression. | 4.1 Introduction to HTML forms<br>4.2 Handling User Input With $_ GET[], $_POST[], $_REQUEST[].<br>4.3 Regular Expressions: Concept, use.<br>4.4 Types of Regular Expressions, Perl Compatible Expressions. Posix Regular Expression | 08 |
| **Unit-V**<br><br>**File Handling in PHP** | 5a. Demonstrate Different File and Directory operations | 5.1 Files Operations: Open, Close, Read, Write, Navigate, Copy, Delete, Rename. Determining file attributes<br>5.2 Operations on Directory, Add, Delete, Read Directories<br>5.3 Uploading Files from Clients, Uploading Files with POST | 08 |
| **Unit-VI**<br><br>**ODBC and MYSQL** | 6a. Introduction and necessity of Database<br>6b. Use of ODBC Database<br>6c. Use of MySQL<br>6d. Database Server | 6.1 Introduction to Database<br>6.2 Introduction to ODBC windows<br>6.3 Configuration of ODBC on windows, Connecting to the database, Manipulating Queries<br>6.4 Introduction to MYSQL, Connecting to the database, Manipulating Queries<br>6.5 Concept of Database , abstraction<br>6.6 Structured Query Language, Data | 14 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | | Definition statements, Creating MySQL Database, Use creating table, describe, Alter Table, Drop table, Drop<br>6.7 Database, Data manipulation & Retrieval statements, Insert, Replace, Delete, Update, Select<br>6.8 PHP & Relational Databases PHP's MySQL interface, An online Library, Database Abstraction | |
| | | **TOTAL** | **48** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

| Unit No. | Unit Title | Distribution of Theory Marks | | | |
|---|---|---|---|---|---|
| | | R Level | U Level | A Level | Total Marks |
| I | PHP Fundamentals | 06 | 04 | 02 | 12 |
| II | Arrays and Functions | 04 | 04 | 02 | 10 |
| III | OOP with PHP | 06 | 04 | 04 | 14 |
| IV | User input & Regular Expressions | 06 | 02 | 04 | 12 |
| V | File Handling in PHP | 04 | 04 | 08 | 16 |
| VI | ODBC and MYSQL | 04 | 04 | 08 | 16 |
| | **TOTAL** | **30** | **22** | **28** | **80** |

**Legends:** R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

**Note**: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.

| Sr. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. required |
|---|---|---|---|
| 1 | I | Write a program to show the use of following operators used in PHP Arithmetic, Logical, Comparison, Relational | 06 |
| 2 | I | Write a program using switch case for following cases.<br>- Factorial, Prime no, Even ODD, Positive/ Negative | 06 |
| 3 | II | Write a program use PHP built-in functions: Array functions, String Functions. | 06 |
| 4 | II | Write a program using function to find factorial of number using following function types: User defined functions with pass by value | 06 |
| 5 | II | Write a program to find a raise to b using passing by value with no | 06 |

| Sr. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. required |
|---|---|---|---|
| | | return type | |
| 6 | II | Write a program to find area & perimeter of Rectangle using passing by reference Function | 06 |
| 7 | III | Write a program to demonstrate use of inheritance. | 06 |
| 8 | IV | Write a program for following File operations: read, write operation | 06 |
| 9 | VI | Write a program for Employee management Using ODBC connectivity with Access | 08 |
| 10 | VI | Write a program for Database connectivity using MySQL | 08 |
| | | **TOTAL** | **64** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Study of Procedural Oriented Programming vs. Object Oriented Programming.
2. Prepare a sample File System Applications with following details
    a. Online Storage Application,
    b. New User Registration
    c. Logging on
    d. Creating folders, Removing a folder
    e. Uploading files
    f. Logging off
3. Case Study on Various PHP frameworks.
    a. Word Press.
    b. Joomla.
4. Case Study on JavaScript Framework Jquery.

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Demo lectures with power point presentations using LCD projector should be arranged to develop

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Argerich, choi, Egervari | Professional PHP4 | SPD, Calcutta |
| 2 | Programming php | Rasmuslerdurf | PHP |
| 3 | Learning php | David sklar | O'Reilly. |

### B) Software/Learning Websites

1. www.php.Net
2. www.w3schools.com

### C) Major Equipment/ Instrument with Broad Specifications

1. Software: Server-Apache Server
2. Editor: Sublime text 3.0
3. PHP Stack Softwares: Easy PHP (Version12.0), USB WebServer8.0, WAMP

**10.0 MAPPING MATRIX OF PO'S AND CO'S:**

| **Course Outcomes** | **Programme Outcomes** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | **e** | **f** | **g** | **h** | **i** | **j** | k |
| CO1 | M | H | M | M | | | H | | | | |
| CO2 | M | M | | | | | L | | | | |
| CO3 | | H | | | | | L | | | | L |
| CO4 | | | L | | M | | | | | | M |
| CO5 | | H | H | | | L | | | | | M |
| CO6 | | H | H | | | L | | | | H | H |
| CO7 | | H | H | M | H | | | H | M | M | H |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME :** Diploma Programme in Information Technology(IF) / Computer Technology(CM)
**COURSE :** Mobile Computing and Application Development (MCD) **COURSE CODE :** 6542

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 03 | -- | 04 | 07 | 03 | Max. | 80 | 20 | 100 | -- | 25 | 25 | 150 |
| | | | | | Min. | 32 | -- | 40 | -- | 10 | 10 | -- |

## 1.0 RATIONALE:

This course is introducing the core concepts of mobile network with Mobile Application Development. It also includes the Mobile Application Development with Open source Operating system like Android OS.

Learning this course would improve the employment potential of students in the software development especially Mobile application development.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Describe Mobile computing concepts
2. Work with android application development and its structure
3. Use concepts of layout, GUI and design in Application development
4. Use event and exception handling for application development
5. Working with menus, application launching and working with database

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Explain functioning of different mobile technology
2. Demonstrate Android activities life cycle
3. Execute operations on GUI objects
4. Perform Event driven programming
5. Apply various techniques on working with menu

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Introduction to Mobile Computing** | 1a. Explain brief Introduction to Mobile technology and generations<br>1b. Define and explain characteristics of GSM and CDMA<br>1c. Explain services and architecture of GSM AND Mobile Computing<br>1d. Explain characteristics, Application & Security issue of Mobile Computing<br>1e. Explain Middleware and Gateway for Mobile Computing<br>1f. Explain Mobile IP and mobile Communication | 1.1 Concept of Mobile Communication<br>1.2 Different generations of wireless technology<br>1.3 Basics of cell, cluster and frequency reuse concept<br>1.4 Noise and its effects on mobile<br>1.5 Understanding GSM and CDMA<br>1.6 Basics of GSM architecture and services like voice call, SMS, MMS, LBS, VAS<br>1.7 Different modes used for Mobile Communication<br>1.8 Architecture of Mobile Computing(3 tier)<br>1.9 Design considerations for mobile computing<br>1.10 Characteristics of Mobile Communication<br>1.11 Application of Mobile Communication | 10 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | Protocol<br>1g. Introduction to Mobile computing through telephony. | 1.12 Security Concern Related to Mobile Computing<br>1.13 Middleware and Gateway required for mobile Computing<br>1.14 Making Existing Application<br>1.15 Mobile Enable<br>1.16 Mobile IP<br>1.17 Basic Mobile Computing Protocol<br>1.18 Mobile Communication via Satellite: Low orbit satellite, Medium orbit satellite, Geo stationary satellite, Satellite phones | |
| **Unit-II**<br><br>**Introduction to Android** | 2a. Analyze Open source mobile technology, Explain Basics of Application development<br>2b. describe Framework, SDK, Emulation<br>2c. Explain Android Application structure | 2.1 Overview of Android<br>2.2 What does Android run On – Android Internals?<br>2.3 Android for mobile apps development<br>2.4 Environment setup for Android apps Development<br>2.5 Framework - Android- SDK, Eclipse<br>2.6 Emulators – What is an Emulator / Android AVD?<br>2.7 Android Emulation – Creation and set up<br>2.8 First Android Application | 10 |
| **Unit-III**<br><br>**Android Activities and GUI Design Concepts** | 3a. Explain Android Activities lifecycle and UI Layout<br>3b. Explain Expressions, Manifest, other necessary UI concept<br>3c. List and explain GUI Objects,<br>3d. Explain Layout Design concepts | 3.1 Design criteria for Android Application : Hardware Design Consideration, Design Demands For Android application, Intent, Activity, Activity Lifecycle and Manifest<br>3.2 Creating Application and new Activities<br>3.3 Simple UI -Layouts and Layout properties :Introduction to Android UI Design, Introducing Layouts<br>3.4 XML Introduction to GUI objects viz.: Push Button, Text / Labels, Edit Text, ToggleButton, Padding | 09 |
| **Unit-IV**<br><br>**Advanced UI Programming** | 4a. Explain Android Event driven Programming, Activity Lifecycle, Explain Exception handling | 4.1 Event driven Programming in Android (Text Edit, Button clicked etc.)<br>4.2 Activity Lifecycle of Android | 09 |
| **Unit-V**<br><br>**Toast, Menu, Dialog, List and Adapters** | 5a. Demonstrate working with menu and dialog, Themes, Dialog<br>5b. Perform Demo Application Launching<br>5c. Perform Database operation | 5.1 Menu :Basics, Custom v/s System Menus, Create and Use Handset menu Button (Hardware)<br>5.2 Dialog : Creating and Altering Dialogs<br>5.3 Toast : List & Adapters<br>5.4 Demo Application Development and Launching<br>5.5 Basic operation of SQLite Database<br>5.6 Android Application Priorities | 10 |
| **TOTAL** | | | **48** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

| Unit No. | Unit Title | Distribution of Theory Marks | | | |
|---|---|---|---|---|---|
| | | R Level | U Level | A and above Levels | Total Marks |
| I | Introduction to Mobile Computing | 04 | 08 | 08 | 20 |
| II | Introduction to Android | 04 | 08 | 02 | 14 |
| III | Android Activities and GUI Design concepts. | 04 | 04 | 08 | 16 |
| IV | Advanced UI Programming | 02 | 06 | 04 | 12 |
| V | Toast, Menu, Dialog, List and Adapters | 08 | 08 | 02 | 18 |
| | **TOTAL** | **22** | **34** | **24** | **80** |

**Legends:** R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

***Note**: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

| S. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. required |
|---|---|---|---|
| 1 | II | Installation and setup of java development kit(JDK), setup android SDK, setup Android IDE, setup android development tools (ADT) plugins, create android virtual device | 06 |
| 2 | II | Create "Hello World" application. That will display "Hello World" in the middle of the screen using TextView Widget in the red color | 08 |
| 3 | III | Create application for demonstration of android activity life cycle | 06 |
| 4 | III | Create Registration page to demonstration of Basic widgets available in android. | 06 |
| 5 | III | Create sample application with login module.(Check username and password) On successful login, Chnage TextView "Login Sucessful". And on failing login, alert user using Toast "Login fail" | 08 |
| 6 | III | Create an application for demonstration of Relative and Table Layout in android. | 06 |
| 7 | IV | Create an application that will Demonstrate Button onClick() Event and change the TextView Color based on button Clicked | 04 |
| 8 | IV | Create an application that will get the Text Entered in Edit Text and display that Text using toast (Message). | 04 |
| 9 | V | Create an UI such that, one screen have list of all the types of cars. On selecting of any car name, next screen should show Car details like: name, launched date, company name | 08 |
| 10 | V | Create an application that will Demonstrate various database operations in Android | 08 |
| **TOTAL** | | | **64** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Design sample GUI (Assume Suitable Details)
2. Prepare and Present presentation on different mobile technologies and on Open Source technologies

   3. Prepare comparison of technical features of different mobile communication technologies being used by popular service providers (such as VSNL, Reliance, Vodafone, Idea etc.) in your city/town

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Arrange expert lecture on Android Development
2. Case study on latest technology in Mobile development
3. Case Study any real time Android application with Design and features

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Building Android Apps | IN EASY STEPS | McGraw-Hill Education |
| 2 | Professional Android 2 Application Development | Reto Meier | Wiley India Pvt. Ltd |
| 3 | Beginning Android | Mark L Murphy | Wiley India Pvt. Ltd. |
| 4 | Pro Android | Sayed Y Hashimi and Satya Komatineni | Wiley India Pvt. Ltd |

### B) Software/Learning Websites

1. http://www.tutorialspoint.com/android/
2. http://www.tutorialspoint.com/android/android_overview.htm
3. http://www.codelearn.org/android-tutorial/android-introduction
4. http://pl.cs.jhu.edu/oose/resources/android/Android-Tutorial.pdf
5. http://mobisys.in/blog/2012/01/introduction-to-android-sqlite-database/
6. www.appmakr.com/Android
7. www.telerik.com/android-development

### C) Major Equipment/ Instrument with broad specification

| Sr.No. | Equipment | Specification |
|---|---|---|
| 1 | Desktop Computer | PC Specifications to be followed:<br>Processor: i3 or i5<br>RAM: 4 GB or better, HDD: 1 TB SATA, Monitor: TFT LCD<br>OS: Genuine Windows 8 or 10 Professional or Home Premium or Windows 8 or 10 Ultimate<br>Antivirus: User License for three year |
| 2 | LCD Projector | Display Type: LCD, Light Output: 3200 Lumens |
| 3 | Android SDK | Freeware |

## 10.0 MAPPING MATRIX OF PO'S AND CO'S:

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i | j | k |
| CO1 | | H | H | H | M | | | | | | M |
| CO2 | | M | M | M | M | | | | | | M |
| CO3 | H | M | M | M | | | | | | M | L |
| CO4 | | M | M | M | M | M | | M | | | L |
| CO5 | M | M | M | L | M | M | M | M | M | | M |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME :** Diploma Programme in Information Technology(IF) / Computer Technology(CM)
**COURSE :** Advanced Java Programming (ADJ) **COURSE CODE :** 6544

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 03 | -- | 04 | 07 | 03 | Max. | 80 | 20 | 100 | -- | 25 | 25 | 150 |
| | | | | | Min. | 32 | -- | 40 | -- | 10 | 10 | -- |

## 1.0 RATIONALE:

In the current era of networking, online transaction processing and managing the dataflow over network becomes an important issue. This course is essential for providing knowledge and hands on experience over the issues of managing data on
Web, developing powerful GUI based friendly user interface, server side programming and developing applications for communication over network using object oriented fundamentals. Advanced Java enhances the Java programming. After learning this course, the student will be able to develop standalone/network/web based software projects required in curriculum as well as industry

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Developed applets, Frames using awt and swing components.
2. Developed network based applications.
3. Performed CURD operation on database.
4. Developed server side programs.
5. Developed small desktop or web applications.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Design and Developed applets, Frames using awt and swing components.
2. Developed network based applications.
3. Used CURD operation in standalone and web applications.
4. Used server side programs for developing web applications.
5. Developed small desktop or web applications.

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Introduction to Abstract Window Toolkit(AWT) & Swings** | 1a. Frame and Applet<br>1b. Describe AWT controls and Layout Managers<br>1c. Introduction to Swing | 1.1 Component, container, window, frame, panel, Creating windowed programs & applets.<br>1.2 AWT controls & layout managers<br>1.3 Understanding the use of AWT controls: labels, buttons, checkbox, checkbox group, scroll bars, text field, text area<br>1.4 Understanding the use of layout managers: flowLayout, borderLayout, gridLayout, cardLayout, gridbagLayout, menubars, menus, dialog boxes, file dialog.<br>1.5 Introduction to swing, Swing features, MVC Architecture, Combo Boxes, progress bar, | 10 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | | Tabbed Panes, Scroll Panes, separator, tables, trees, toggle button. | |
| **Unit-II**<br><br>**Event Handling** | 2a. Introduction to Delegation Event Model<br>2b. Explain Event Listener Interfaces. | 2.1 The delegation Event Model, Event sources, Event listeners, Event classes. The Action Event class, The Component Event class, the Container Event class, the Focus Event class, the Item Event class, the Key Event class, the Mouse Event class, the Text Event class, the Window Event class, Adapter classes, Inner classes<br>2.2 Event listener interfaces, The ActionListener Interface, the ComponentListener Interface, the ContainerListener Interface, the FocusListener Interface, the ItemListener Interface, the KeyListener Interface, the MouseListener Interface, the MouseMotion Interface, the TextListener Interface, the WindowsListener Interface, the WindowFocusListener Interface | 06 |
| **Unit-III**<br><br>**Networking & Security** | 3a. Basics of Networking<br>3b. Explain InetAddress Class<br>3c. Describe Sockets<br>3d. Explain URL class<br>3e. Security | 3.1 Basics of Networking: Socket, IP, TCP, UDP, Proxy Server, Internet Addressing<br>3.2 The InetAddress Class Factory methods, Instance methods<br>3.3 TCP/IP Sockets, Socket, Server Socket, methods<br>3.4 URL, URL Connection, http, URL Connection methods, creating & using TCP/IP client & server<br>3.5 Security with Java: Theoretical introduction to java security, secure coding guidelines for java programming language. | 08 |
| **Unit-IV**<br><br>**Interacting with Database** | 4a. Explain Connecting JDBC-ODBC | 4.1 JDBC, ODBC, & Other APIS, JDBC two tier & three tier models, connecting to Database. Driver Interface, Driver Manager Class, Connection Interface, Statement Interface, the java.sql.package. Establishing connection & retrieving information Resultset. Interface, CRUD operations using JDBC | 10 |
| **Unit-V**<br><br>**Servlets & JSP** | 5a. Introduction to Servlet<br>5b. Describe Session and Cookies<br>5c. Introduction to JSP<br>5d. Describe RMI and EJB | 5.1 Basics of Web applications, use of tomcat server, Type of Servlet, Servlet life cycle, using servlets, handling request and response.<br>5.2 Basic concepts of sessions, cookies & session tracking,<br>5.3 JSP introduction, life cycle of JSP, scriptlet tag, expression tag, declaration tag, Implicit Objects, Directives, Action Elements, JSP Expression language, JSTL, JSP custom tags.<br>5.4 Introduction to RMI, Introduction to EJB | 14 |
| | | **TOTAL** | **48** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

| Unit No. | Unit Title | Distribution of Theory Marks | | | |
|---|---|---|---|---|---|
| | | R Level | U Level | A and above Levels | Total Marks |
| I | Introduction to Abstract Windowing Toolkit(AWT) & Swings | 06 | 06 | 04 | 16 |
| II | Event Handling | 02 | 04 | 04 | 10 |
| III | Networking & Security | 06 | 04 | 04 | 14 |
| IV | Interacting with Database | 04 | 04 | 08 | 16 |
| V | Servlets & JSP | 04 | 08 | 12 | 24 |
| | **TOTAL** | **22** | **26** | **32** | **80** |

**Legends:** R = Remembrance (Knowledge); U = Understanding; A = Application and above levels (Revised Bloom's taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignment/task should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the desired programme outcome/course outcome.

**Note**: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in the mapping matrix for this course. Faculty should ensure that students also acquire Programme Outcomes/Course Outcomes related to affective domain.

| S. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Hours |
|---|---|---|---|
| 1 | I | Write a program to design a form using the components textfield, label, checkbox, button, list. | 04 |
| 2 | II | Write a program to design a calculator using Java components and handle various events related to each component and apply proper layout to it. | 04 |
| 3 | I, II | Write a program to create a menu bar with various menu items and sub menu items. Also create a checkable menu item. On clicking a menu Item display a suitable Dialog box. | 04 |
| 4 | I | Write a program using swing to display a JcomboBox in an applet with the items – cricket, football, hockey, tennis | 04 |
| 5 | I | Write a program to create.<br>-Jtree<br>-JTable | 04 |
| 6 | II | Write a program making use of Adapter class. | 04 |
| 7 | III | Write a program to retrieve hostname--using methods in Inet Address class. | 04 |
| 8 | III | Write a program that demonstrates TCP/IP based communication between client and server. | 04 |
| 9 | IV | Write an Application program /Applet to make connectivity with database using JDBC, API | 04 |
| 10 | IV | Write an Application program/Applet to send queries through JDBC bridge & handle result. | 04 |
| 11 | V | Write a servlet for demonstrating the generic servlet class. | 04 |
| 12 | V | Create a web form which processes servlet and demonstrates use of cookies and sessions | 04 |
| 13 | V | Develop a simple JSP program for user login form. | 04 |

| S. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Hours |
|---|---|---|---|
| 14 | V | Develop a simple JSP program to display the grade of a student by accepting the marks of five courses. | 04 |
| 15 | I to V | Mini Project | 08 |
| | | **TOTAL** | **64** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Discuss different frameworks or tools for advanced java programming. E.g. spring, hibernate, windows builder in eclipse for standalone application etc.
2. Search and Use external jar files in your application.
3. Present your application and discuss various aspects of software e.g. security, efficiency, cost etc.

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Arrange expert seminar of industry person in the area of advanced java programming.
2. More focus should be given on practical work which will be carried out in laboratory sessions. If possible some theory sessions may be conducted in labs so that theory and practice can go hand in hand.

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Complete reference | Herbert Schildt | Tata McGraw Hill |
| 2 | Unleashed java2 platform | Jamie Jaworkski | Techmedia |
| 3 | The Complete IDIOT's guide to JAVA2 | Michale Morrison | Prentice Hall of India |
| 4 | Java Servlets | Karl Moss | Tata McGraw Hill |
| 5 | JSP a beginner's guide | Gray Bolinger and Bharti Natarajan | Tata McGraw Hill |

### B) Software/Learning Websites

1. http://www.oracle.com/technetwork/java/seccodeguide-139067.html
2. http://www.tutorialspoint.com/awt/
3. http://www.javatpoint.com
4. http://docs.oracle.com/javaee/5/tutorial/doc/bnafd.html

### C) Major Equipment/ Instrument with Broad Specifications

| Sr.No. | Equipment | Specification |
|---|---|---|
| 1 | Desktop Computer | Processor: intel core i5, Memory: at least 4GB RAM<br>Hard drive: at least 320GB hard disk |
| 2 | LCD Projector | Display Type: LCD<br>Light Output: 3200 Lumens |

## 10.0 MAPPING MATRIX OF PO'S AND CO'S:

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i | j | k |
| CO1 | H | H | H | | | | | L | L | | |
| CO2 | | H | H | M | | | | | | | |
| CO3 | M | H | H | M | | | M | | | | |
| CO4 | M | H | H | M | | L | | | | | |
| CO5 | | H | | H | L | | M | H | M | H | L |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME :** Diploma Programme in Information Technology(IF) / Computer Technology(CM)
**COURSE :** Linux Operating System (LOS) **COURSE CODE :** 6545

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 03 | -- | 04 | 07 | 03 | Max. | 80 | 20 | 100 | -- | 25 | 25 | 150 |
| | | | | | Min. | 32 | -- | 40 | -- | 10 | 10 | -- |

## 1.0 RATIONALE:

Now a day's open source software movement is becoming noteworthy. This rapid evolutionary process produces better software than the traditional closed model, When programmers on the Internet can read, redistribute and modify the source for a piece of software, it evolves. People improve it, people adapt it and people fix bugs. And this can happen at a speed if Knowledge of recent trends and development in this area is kept updated.

Linux is an open--source operating system and to date the most dramatically successful open--source platform. Linux is very popular in education, Internet service applications, software development shops and (increasingly) in small businesses. Several successful companies market Linux and Linux applications.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Acquaint with recent trends and development in open source software development.
2. Install and implement Linux systems.
3. Implement Linux commands.
4. Implement Linux commands.
5. Write Programs using shell Programming.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Distinguish between various operating systems.
2. Evaluate the usefulness of Linux OS.
3. Identify use of various commands.
4. Distinguish between different types of shell.
5. Outline shell scripting.

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Introduction** | 1a. Explain the basic aspects of Operating System.<br>1b. Describe how Linux was introduced to the world.<br>1c. Explain needs and benefits for studying Distributions.<br>1d. Explain difference between various OS<br>1e. Outline importance of | 1.1 Review of operating system concepts<br>1.2 History of GNU Project<br>1.3 Open Source Software Movement and Linux Operating system<br>1.4 Various Distributions of Linux operating system and their features<br>1.5 Overview of Linux based Application softwares, programming languages, tools and utilities.<br>1.6 UNIX Vs Linux and MS--Windows Vs Linux.<br>1.7 Role of Linux system as server, | 10 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | Linux as server. | workstation and desktop.<br>1.8 Applications of Linux Server | |
| **Unit-II**<br><br>**Installation of Linux OS** | 2a. Explaining how partition is done<br>2b. Outline the steps for installation of Linux OS.<br>2c. Explain startup & shutdown procedure of linux.<br>2d. Describe various file systems | 2.1 Types of Partitions --Root partition, Swap partition and all other Linux Partitions,<br>2.2 Types of various file systems and their features.<br>2.3 Setting up disk partitions.<br>2.4 Partitioning tools-- Fdisk, Disk druid and Partition Manager.<br>2.5 Mounting file systems.<br>2.6 Installation of Linux -- Dual Booting. GRUB Boot--Loader. Creation of user accounts<br>2.7 System startup and shut down of Linux, Password Techniques & Shadow Password | 10 |
| **Unit-III**<br><br>**General Overview of Linux File System** | 3a. Understanding concept of X-Window and X-Server.<br>3b. Study of Desktop Environment. | 3.1 I Node Structure, Concepts of X--window, X--server concepts.<br>3.2 Client--server Environment.<br>3.3 Desktop environment: KDE, GNOME – interfaces and tools.<br>3.4 General overview of Linux File system. | 08 |
| **Unit-IV**<br><br>**Linux Commands** | 4a. Describe linux terminal.<br><br>4b. Distinguish between various linux commands as per their use. | 4.1 Entering and executing Commands.<br>4.2 File Manipulation commands, Directory Manipulation commands<br>4.3 Processes in Linux and their overall working and states, process control commands<br>4.4 General purpose commands,<br>4.5 Communication, Help commands. | 10 |
| **Unit-V**<br><br>**Linux Shell Scripting** | 5a. Distinguish between various shells.<br>5b. Explaining the basics of linux programming.<br>5c. Applying programming concepts for writing shell script | 5.1 Different shells in Linux. Comparison between Different Shells.<br>5.2 Features and use of Bash shell. Shell scripting commands-- Read, echo, Looping, Decision making, operators, ending processes.<br>5.3 Writing simple shell scripts and Executing shell scripts | 10 |
| **TOTAL** | | | **48** |

## 5.0 SUGGESTED\ SPECIFICATION TABLE WITH MARKS (THEORY)

| Unit No. | Unit Title | Distribution of Theory Marks | | | |
|---|---|---|---|---|---|
| | | R Level | U Level | A and above Levels | Total Marks |
| I | Introduction | 08 | 04 | 04 | 16 |
| II | Installation of Linux OS | 04 | 08 | 04 | 16 |
| III | General Overview of Linux File System | 04 | 04 | 04 | 12 |
| IV | Linux Commands | 04 | 06 | 08 | 18 |
| V | Linux Shell Scripting | 04 | 06 | 08 | 18 |
| | **TOTAL** | **24** | **28** | **28** | **80** |

**Legends:** R = Remembrance (Knowledge); U= Understanding; A= Application and above

levels (Revised Bloom's taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

***Note**: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes** in affective **domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

| S. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. Required |
|---|---|---|---|
| 1 | II | Installing linux Operating System on PC. | 06 |
| 2 | III | Identify and use of the major desktop components of GNOME and KDE interfaces and their functions. | 06 |
| 3 | IV | Use of file and directory manipulation commands – ls, cd, pwd, dir, touch, cat, mkdir, rmdir, rm, mv, cp, head, tail, diff, comm, lpr, chmod, | 08 |
| 4 | IV | Use of text processing and communication commands – tr, wc, cut, paste, sort, grep, mesg, who, who am i, | 08 |
| 5 | IV | Use of general purpose and process commands-- ps exit, kill, bc, date, time, cal, clear, banner, su, man. | 06 |
| 6 | V | Write and execute two shell scripts using input--output statements/commands. | 06 |
| 7 | V | Write and execute two shell scripts using control loop. | 06 |
| 8 | V | Write and execute two shell scripts for file handling. | 06 |
| 9 | V | Write and execute two shell scripts using command line arguments. | 06 |
| 10 | IV | Executing commands like mail, smail, write, talk for sending electronic mails. | 06 |
| | | **TOTAL** | **64** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Installing two distributions(RED HAT & UBUBTU) in lab and understanding the working of Linux on different GUI
2. Test cases that the student can run to verify that its implementation produce the expected result. Aims at increasing student's autonomy and confidence.
3. Problem solving: practice newly acquired knowledge by achieving programming challenges inspired from actual situations.

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Arrange expert lecture for understanding the importance of Linux over windows.
2. Arrange workshop for minimizing the difference between syllabus and industry working

## 9.0 LEARNING RESOURCES:

### A) Books

| S.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Mastering LINUX | Arman danesh | John Wiley & Sons (Asia) Pvt. ltd. |
| 2 | LINUX | Redhat | Tata McGraw—Hill |
| 3 | Guide to Linux Installation & Administration | Nicholos wells | Prentice Hall of India (vikas publication) |
| 4 | Linux system administration Handbook | Mark f komarenski | Tata McGraw—Hill (ptr/ph publication) |
| 5 | Yashwant Kanetkar | Unix Shell Programming | BPB |

### B) Software/Learning Websites

1. www.denett.com
2. www.tatamcgrawhill.com
3. www.phindia.com
4. www.wiley.com/college/silberschatz6e/0471417432/slides/ppt
5. www.en.wikipedia.org
6. www.computerworld.com
7. www.computer.howstuffworks.com
8. www.willamstallings.com/os4e.html
9. www.deitel.com/books/os3e/slides.html

### C) Major Equipment/ Instrument with Broad Specifications

1. Computers with i3 processor configuration
2. Red hat Linux

## 10.0 MAPPING MATRIX OF PO'S AND CO'S:

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i | j | k |
| CO1 | H | M | | | M | H | | | M | | M |
| CO2 | H | | | | | | L | | | | |
| CO3 | H | M | | | | H | | M | | | M |
| CO4 | | M | M | | M | | | | M | | |
| CO5 | H | | | M | M | H | | M | | M | M |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME :** Diploma Programme in Information Technology(IF) / Computer Technology(CM)
**COURSE :** Network Administration and Management (NAM) **COURSE CODE :** 6546

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 02 | -- | 02 | 04 | -- | Max. | -- | -- | -- | -- | 25 | 25 | 50 |
| | | | | | Min. | -- | -- | -- | -- | 10 | 10 | -- |

## 1.0 RATIONALE:

It is an era of computers. In each and every field, computers are used for different applications. So, personal computer users have a need to connect their intelligent workstation to other computers for sharing peripherals such as printers with a user at another personal computer. The users may have a need to access data or execute applications software that resides on another computer. Again the user may need special processing capabilities that are only available on the other computer.

The task of connecting our stand-alone computers often requires a thorough knowledge of connectivity, hardware and software. It provides practical knowledge that will enable the students to get a connectivity job done quickly and easily so the students can get on with the applications and data sharing work they need to do.

This course is network application based course. It gives the practical knowledge of designing computer network while using any type of topologies. This course covers the installation and configuration of any network operating system. With the proper configuration of operating system on the server, the students will manage and administer the network resources or devices such as printers, scanner, driver and also software like files, folders, directories, applications, programs etc.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Compare different types of network.
2. Describe the different types of network directory services.
3. Design the computer network.
4. Configure the networking resources and software from the server.
5. Know the network management and administration.
6. Analyse different types of network technologies for internet connection.
7. Able to do Network management.
8. Troubleshoot and repair the network fault

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Remember basic hardware & software requirement for building a network
2. State the importance of Network operating System & Concept of Active Directory Services.
3. Configuration of DHCP and DNS.
4. Understand network administration and maintaining security.
5. Identify the different types of networks.

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I** | 1a. Distinguish between various | 1.1 **Network Related Jobs-** Network Administrator, Network Engineer, | 06 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Exploring Directory Services and Remote Network Access.** | types of Networks<br>1b. Configure the networking resources and software from the server.<br>1c. State the importance of Network operating System & Concept of Active Directory Services. | Network Architecture / Designer, Other Network Related Jobs.<br>1.2 **Directory Services-** Define Directory Services, Definition of Novell eDirectory, Windows NT domains, Microsoft's Active Directory, X500 Directory Access Protocol, Lightweight Directory Access Protocol, Forests, Trees, Roots and Leaves.<br>1.3 **Active Directory Architecture**- Object Types, Object Naming, Canonical Names, LDAP Notation, Globally unique identifiers, User Principle Names, Domain, Trees & Forests.<br>1.4 **Remote Network Access-** Need of Remote Network Access, Public Switched Telephone Network, Integrated Services Digital Network, Digital Subscriber Line, CATV.<br>1.5 **Virtual Private Network-** VPN Protocols, Types of VPNs, VPN Clients, SSL VPNs. | |
| **Unit-II**<br><br>**Network Connection and Printing Services** | 2a. Configure DHCP RARP and Internet Protocols<br>2b. Describe DNS, functions of DNS. | 2.1 **Dynamic Host Configuration Protocol (DHCP)-** DHCP Origins, Reverse Address Resolution Protocol (RARP), The Bootstrap Protocol (BOOTP), DHCP Objectives, IP Address Assignment, DHCP Architecture.<br>2.2 I**ntroduction to Domain Name System(DNS)-** DNS Objectives, Domain Naming, Top Level Domains, Second Level Domains, Sub domains, DNS Functions, Resource Records, DNS Name Resolution, Resolves, DNS Requests, Root Name Servers, Resolving a Domain Name, DNS Name Registration.<br>2.3 **Understand Network Printing Concepts**- Understand Network Printing Concepts, Locally connected print devices, setting up local print devices, Shared print devices, Sharing Locally Attached Print Devices, Describe Windows Network Printing, Add Print Wizard. | 06 |
| **Unit-III**<br><br>**Implementation of Network** | 3a. Describe transmission media.<br>3b. Explain types of wired media<br>3c. Describe types of wireless media and | 3.1 **Designing Network :** Accessing Network Needs, Applications, Users, Network Services, Security and Safety, Growth and Capacity Planning, Meeting Network Needs- Choosing Network Type, Choosing Network Structure, Choosing Servers. | 08 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | cellular telephone<br>3d. Distinguish between wired and wireless media<br>3e. Configure and install windows 2003 server. | 3.2 **Installing and Configuring Windows 2003 Server**- Preparing for Installation, Creating windows 2003 server boot disk, Installing windows 2003 server, Configuring server/ client<br>3.3 **Setting windows 2003 server**- Creating Domain controller, Adding the DHCP and WINS roles, Adding file server and print server, Adding Web based Administration. | |
| **Unit-IV**<br><br>**Administering Windows 2008Server (The Basics)** | 4a. Create user accounts and apply account policies<br>4b. Explain Windows 2008.<br>4c. Manage the win 2008 security group.<br>4d. Manage database using window 2008 server backup software. | 4.1 **Working With User Accounts**- Adding a User, Modifying User Account, Deleting or Disabling a User Account.<br>4.2 **Working With Windows 2008 Security Groups**- Creating Group, Maintaining Group Membership.<br>4.3 **Working with Shares**- Understanding Share Security, Cresting Shares, Mapping Drives.<br>4.4 Administering Printer Shares- Setting up Network Printer.<br>4.5 **Working with Windows 2008 Backup-** Using Windows 2008 Servers Backup Software | 08 |
| **Unit-V**<br><br>**Web Server** | 5a. Describe the concept of web server<br>5b. Explain IIS applications | 5.1 concept of web server, IIS Applications | 04 |
| **TOTAL** | | | **32** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Not Applicable

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

***Note**: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes** in affective **domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

| S. No. | Practical Exercises (Any Five Visits and Five Reports/Assignments) | Approx. Hrs. required |
|---|---|---|
| 1 | Introduction Windows 2008 server | 02 |
| 2 | Creating Windows 2008 Server Boot Disk. | 04 |
| 3 | Installing Windows 2008 Server | 04 |
| 4 | Installing Active Directory | 04 |

| S. No. | Practical Exercises (Any Five Visits and Five Reports/Assignments) | Approx. Hrs. required |
|---|---|---|
| 5 | Creating AD Objects | 04 |
| 6 | Creating users and assigning rights. Setting security levels | 04 |
| 7 | Implementation of Remote Desktop using RDP(Remote Desktop Protocol) and TELNET | 02 |
| 8 | Installation of web server IIS | 02 |
| 9 | Installing and Configuring a Print server | 02 |
| 10 | Installation of DHCP server | 02 |
| 11 | Group of four students prepare a mini report on Latest Networking Technology | 02 |
| | **TOTAL** | **32** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Develop mini project report on latest network technology.
2. Collect information related to router, routing table and message transmission process.
3. Create user account and access permissions from server.
4. Design and demonstrate small LAN network in laboratory.

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Industrial visit
2. Expert Lectures on Network Administration

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Computer Network | Hall Berg | Tech max |
| 2 | Introduction to Networking | Richard A. McMahan, Sir | Tata McGraw Hill Edition |
| 3 | The Complete Reference Networking | Craig Zacker | Tata McGraw Hill Edition |

### B) Software/Learning Websites

1. http://www.tutorial5.com/content/blogcategory/19/79/
2. http://www.pms.ifi.lmu.de/mitarbeiter/ohlbach/multimedia/IT/IBMtutorial/3376fm.html

### C) Major Equipment/ Instrument with Broad Specifications

1. Windows server 2008 software.
2. Computers **-**HDD: 40GB Processor: PIV or above Min RAM: 2GB or above OS: 32 bit or 64 bit

## 10.0 MAPPING MATRIX OF PO'S AND CO'S:

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **a** | **b** | **c** | **d** | **e** | **f** | **g** | **H** | **i** | **j** | **k** |
| CO1 | | m | | H | | | | | | H | M |
| CO2 | | M | M | M | | | | L | M | M | |
| CO3 | | M | H | H | | H | L | | | | |
| CO4 | | M | M | H | H | L | H | M | | | H |
| CO5 | | M | H | H | | H | | | H | H | H |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME :** Diploma Programme in Information Technology(IF) / Computer Technology(CM)
**COURSE :** VB.NET Technology (VBN) **COURSE CODE :** 6548

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 02 | -- | 02 | 04 | -- | Max. | -- | -- | -- | -- | 25 | 25 | 50 |
| | | | | | Min. | -- | -- | -- | -- | 10 | 10 | -- |

## 1.0 RATIONALE:

The scope of Internet and Web Technology is increasing very fast, hence it is essential to develop the manpower in these areas. The learners shall be aware of various tools used in dynamic web page designing and hosting of websites. This course contains tools for developing web applications as well as desktop applications.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Knows about .NET framework.
2. Acquire the knowledge and features of VB.NET.
3. Create Window application using VB.NET
4. Describe polymorphism, Inheritance and object oriented concept used in VB.NET
5. Apply different file operation and serialization.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Acquires the knowledge of.NET framework.
2. Recognize the problem modeling approach with modularity using functions.
3. Develop the program by using object oriented techniques in VB.NET.
4. Develop application by using different control of VB.NET
5. Utilize the basics of file operations.
6. Create the crystal Report.
7. Create data driven application by using VB.NET framework and ADO.NET

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Introduction to VB.NET** | 1a. Introduction to the.NET frame work and Architecture<br>1b. Understand VB.NET Development Environment | 1.1 Event Driven Programming<br>1.2 .NET as better Programming Platform<br>1.3 .NET Framework<br>1.4 .NET Architecture<br>1.5 The Just-In-Time Compiler<br>1.6 .NET Framework class library introduction<br>1.7 VB.NET Development<br>1.8 Environment. Creating Applications.<br>1.9 Building Projects. Using simple components. Running VB.NET applications. | 04 |
| **Unit-II**<br><br>**Implementation** | 2a. Study the features of VB.NET<br>2b. Study of core | 2.1 Features<br>2.2 VB.NET IDE<br>2.3 Data types | 04 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **of VB.NET** | Program components of VB.NET. | 2.4 Operators<br>2.5 Loops<br>2.6 Control Structures<br>2.7 Cases<br>2.8 Procedures<br>2.9 Error Handling<br>2.10 Properties<br>2.11 methods and events | |
| **Unit-III**<br><br>**Object Oriented Programming in VB.NET** | 3a. Introduction to basic concept of object oriented programming<br>3b. Implementation of concept of oops in VB.NET | 3.1 Introduction to OOP. Advantages & Disadvantages.<br>3.2 Basic Concept of OOP, Classes & Objects.<br>3.3 Constructors and Destructors.<br>3.4 Method overloading<br>3.5 Overloading and Overriding.<br>3.6 Inheritance and polymorphism<br>3.7 Access modifiers: - Public, Private, Protected, Friend.<br>3.8 Array<br>3.9 Interfaces<br>3.10 Exception Handling | 04 |
| **Unit-IV**<br><br>**Windows Applications in VB.NET.** | 4a. Introduction to different controls of VB.NET<br>4b. Create small and simple Window application. | 4.1 Windows Forms<br>4.2 Controls : Text Boxes, Buttons, Labels, Check Boxes and Radio Buttons List Boxes, Combo boxes. Picture Boxes, scrollbars,<br>4.3 Splitters, Timer, menus, Built-in Dialogs, Image List, Tree Views, List Views, toolbars, Status Bar and Progress bars. | 04 |
| **Unit-V**<br><br>**File handling & Serialization** | 5a. Concept of file handling and Directory classes | 5.1 File handling using File Stream, using Stream Writer, using Stream Reader, using Binary Reader<br>5.2 Binary Writer classes.<br>5.3 File and Directory Classes<br>5.4 Types of Serialization. | 04 |
| **Unit-VI**<br><br>**Databases in VB.NET** | 6a. Introduction to database and dataset<br>6b. Implementation of connection of database<br>6c. Concept of Data binding with different controls | 6.1 Database, Connections, Data adapters, Datasets, Data Reader,<br>6.2 Connection to database with server explorer.<br>6.3 Multiple Table Connection.<br>6.4 Data binding with controls like Text Boxes, List Boxes, Data grid etc.<br>6.5 Navigating data source | 06 |
| **Unit-VII**<br><br>**Crystal Report** | 7a. Introduction to Crystal Report.<br>7b. Working with crystal Report | 7.1 Connection to Database : Table, Queries, Building Report, Modifying Report<br>7.2 Formatting Fields and Object Header, Footer, Details, Group.<br>7.3 Header, Group footer, Summary<br>7.4 Working with formula fields, Parameter fields, Group, special fields | 06 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | | 7.5 Working with Multiple Tables, SQL in Crystal Report, Report Temples | |
| | | **TOTAL** | **32** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Not Applicable

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

***Note**: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes** in affective **domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

| Sr. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. required |
|---|---|---|---|
| 1 | I | Create a simple Console Application using VB.NET. | 04 |
| 2 | II | Create Windows Application using VB.NET controls. | 04 |
| 3 | III | Create Window Application using Class. | 02 |
| 4 | IV | Create Window Application using Built in Dialogs. | 04 |
| 5 | IV | Apply Interface on Windows Application Form. | 04 |
| 6 | V | Write program for File Handling. | 02 |
| 7 | VI | Create Window Application for Connected database. | 04 |
| 8 | VI | Create Window Application for Disconnected database. | 04 |
| 9 | VII | Create Crystal Report of your any window application. | 04 |
| | | **TOTAL** | **32** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Prepare a mini project by integrating all above practicals.

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Demo lectures with power point presentations using LCD projector should be arranged to develop

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Programming Microsoft Visual Basic.NET | Francesco Balena | Microsoft Press |
| 2 | The Complete Reference -Visual Basic.NET | Jefrey R. Shapiro | Osborne/McGraw Hill |
| 3 | Murach's VB.NET database programming with ADO.NET | Anne Prince and Doug Lowe | Murach |
| 4 | The Visual Basic.NET COACH | Jelf Salvage | Addison Wesley |
| 5 | Mastering Crystal Report | MCCOY Mastering | BPB Publication |

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 6 | Crystal Report – The Complete Reference | George Peck | Tata McGraw Hill |

**B) Software/Learning Websites**

1. vb.net-informations.com/
2. www.tutorialspoint.com/vb.net/
3. www.dotnetspider.com

**C) Major Equipment/ Instrument with Broad Specifications**

1. Hardware: Desktop Computer P-IV processor or higher, 40GB HDD
2. Software: Visual Studio, MSAcess, SQL server

**10.0 MAPPING MATRIX OF PO'S AND CO'S:**

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **a** | **b** | **c** | **d** | **e** | **f** | **g** | **h** | **i** | **j** | **k** |
| CO1 | L | H | H | H | | | L | | | L | |
| CO2 | | H | M | L | L | | | | | L | M |
| CO3 | | H | M | L | | L | | | L | L | M |
| CO4 | | M | L | L | L | | | | | M | L |
| CO5 | | M | L | L | | | | | | | L |
| CO6 | | | L | | | | L | | M | | |
| CO7 | | L | H | H | | | | M | | | M |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME** : Diploma Programme in Computer Technology(CM)
**COURSE** : Computer Security(CSC) **COURSE CODE** : 6549

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 03 | -- | 02 | 05 | 03 | Max. | 80 | 20 | 100 | -- | 25 | 25 | 150 |
| | | | | | Min. | 32 | -- | 40 | -- | 10 | 10 | -- |

## 1.0 RATIONALE:

Computer security, one of the most important and relevant area of computing today. The requirement to address security in computer system design is an important design consideration in many of today's systems. It is essential to understand various threats to secure computing and the basic security design principles and techniques developed to address these threats. The student will achieve a firm intuition about what computer security means, be able to recognize potential threats to confidentiality, integrity and availability.

This course will introduce basic cryptography, fundamentals of computer/network security, risks faced by computers and networks, security mechanisms, operating system security, secure systems design principles and network security principles. It will develop knowledge for security of information and information systems within organizations. It focuses on concepts and methods associated with planning, managing and auditing security at all levels including networks

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Indentify various threats, risks, challenges and basics associated with computer systems and information
2. Implement cryptographic algorithms and security protocols to maintain information security
3. Identify threats and preventive measures of network security
4. Apply security principles and techniques to secure OS, software and web applications
5. Describe recovery mechanism and cyber crimes

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Describe security threats, attacks, risks, challenges and security basics of computer systems and information
2. Prepare and implement cryptographic algorithms and certificates to secure sensitive information
3. Explain standard practices and protocols to secure network and networking resources
4. Implement OS and application hardening techniques to secure OS and applications
5. Apply various types of recovery techniques and cyber crimes to avoid malpractices

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Computer and Operational Security** | 1a. Knowledge about security and security threats<br>1b. Explain different types of attacks and | 1.1 Security: Introduction, need for security, Threats to security, Avenues of attack and Steps in attack.<br>1.2 Types of attack: Denial of service, backdoors and trapdoors, sniffing, | 12 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | basic principles of security<br>1c. Describe different roles of people to maintain security in organization<br>1d. Knowledge about different physical security mechanisms | spoofing, man in the middle, replay, TCP/IP Hijacking, Encryption attacks, Malwares, Viruses, Logic bombs and Trojan horses.<br>1.3 Security Basics: Confidentiality, Integrity, Availability, Operational model of Computer Security, Layers of security.<br>1.4 Role of people in security: Password (selection, Management, Components of good password), Piggybacking, Shoulder surfing, Dumpster diving, Installing unauthorized software /hardware, Access by non employees, Security awareness, Individual user responsibilities, Security policies, standards, procedures and guidelines.<br>1.5 Physical Security: Access Control (DAC, MAC, RBAC), Authentication, Biometrics (finger prints, hand prints, Retina, patterns, voice patterns, signature and writing patterns, keystrokes), Social Engineering. | |
| **Unit-II**<br><br>**Information Security** | 2a. Indentify and explain different types of security algorithms<br>2b. describe symmetric and asymmetric cryptographic techniques | 2.1 Introduction: Cryptography, Cryptanalysis, Cryptology, Substitution techniques: Caesar's cipher, mono-alphabetic and Poly-alphabetic, one-time pad, Transposition techniques: Rail fence technique, simple columnar, Steganography, Hashing.<br>2.2 Symmetric and asymmetric cryptography: Introduction to Symmetric encryption, DES (Data encryption Standard) algorithm, Asymmetric key cryptography: Digital Signature.<br>2.3 Public key infrastructures: basics, digital certificates, certificate authorities, registration authorities, Trust models (Hierarchical, peer to peer, hybrid) | 10 |
| **Unit-III**<br><br>**Network Security & Intrusion Detection System** | 3a. introduction to different security mechanism for network security<br>3b. understand intrusion and intrusion detection system | 3.1 Firewalls: Need for Firewall, limitations, characteristics, Types of Firewall : Hardware, Software, Packet filter, Proxy Server, Hybrid, Application gateways, circuit level gateway, Implementing Firewall.<br>3.2 Virtual Private Network, Kerberos, security topologies: security zones, DMZ, Internet, Intranet, VLAN.<br>3.3 Email security: Email security standards, working principle of SMTP, PEM, PGP, S/MIME.<br>3.4 IP security: overview, architecture, | 10 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | | IPSec Configuration, IPSec Security.<br>3.5 Intrusion Detection: Intrusion detection systems (IDS), host based IDS, network based IDS, Honey pots. | |
| **Unit-IV**<br><br>**Software & Web Security** | 4a. identify different techniques to secure OS and applications<br>4b. apply steps to secure software, applications and OS | 4.1 Operating system security: Operating system hardening, general steps for securing operating system, updates: hotfix, patch, service pack.<br>4.2 Application Security: Application hardening, application patches, secure code techniques, buffer overflows, code injection, least privilege, good practices.<br>4.3 Web security threats, web traffic security approaches, Secure Socket layer and transport layer security. | 08 |
| **Unit-V**<br><br>**Recovery Techniques & Cyber Crime** | 5a. understand basics of recovery and cyber crimes<br>5b. implement different recovery techniques to recover sensitive information<br>5c. knowledge about different types of cyber crimes and law to prevent such crimes | 5.1 Recovery: Introduction to Deleted File Recovery, Formatted Partition Recovery, Data Recovery Tools, Data Recovery Procedures and Ethics.<br>5.2 Cyber Crimes: Introduction, Hacking, Types of Hacking, Cracking, Pornography, Software Piracy, Intellectual property, Legal System of Information Technology, Mail Bombs, Bug Exploits, Cyber Crime Investigation, Ethical Hacking.<br>5.3 Cyber Laws: Introduction to IT act 2000 and IT act 2008s. | 08 |
| **TOTAL** | | | **48** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

| Unit No. | Unit Title | Distribution of Theory Marks | | | |
|---|---|---|---|---|---|
| | | R Level | U Level | A and above Levels | Total Marks |
| I | Computer and Operational Security | 10 | 06 | 04 | 20 |
| II | Information Security | 08 | 06 | 02 | 16 |
| III | Network Security & Intrusion Detection System | 08 | 04 | 04 | 16 |
| IV | Software & Web Security | 04 | 04 | 06 | 14 |
| V | Recovery Techniques & Cyber Crime | 06 | 04 | 04 | 14 |
| | **TOTAL** | **36** | **24** | **20** | **80** |

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

***Note**: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of **Programme Outcomes/Course Outcomes in affective domain** as given in a common list at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course*

*Outcomes related to affective domain.*

| S. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. required |
|---|---|---|---|
| 1 | I | Study assignment on different physical security techniques | 02 |
| 2 | II | Install open source Latest version of Cryptool software and Encrypt and decrypt the message using Simple Transposition Permutation( Cryptool) | 04 |
| 3 | II | Encrypt and decrypt the message using Caesar Cipher With Variable Key (Cryptool) | 04 |
| 4 | II | Write a simple program for DES encryption/decryption in java or C or .net | 04 |
| 5 | II | Create Digital Signature document using Cryptool | 04 |
| 6 | III | Installation and configuration of firewall and its policies | 04 |
| 7 | III | Tracing of email origin using eMailTracePro utility | 02 |
| 8 | IV | Knowing the security provided with windows operating system(User authentication) | 02 |
| 9 | IV | Recovery of the password of windows OS using password recovery utility (John the ripper) or any other utility | 04 |
| 10 | IV | Tracing the path of an website/ web server using tracert utility | 02 |
| | | **TOTAL** | **32** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Prepare a list of classes (API) available in java and .NET for implementing cryptography and security
2. Apply different security policies and strategies to secure college computers and network
3. Apply and configure application hardening techniques to secure OS, Applications and web sites

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Arrange workshop on cyber crimes and ethical hacking
2. Arrange visit to cyber crime departments of different organizations
3. Arrange expert lecture or seminar on latest trends in computer security.

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Cryptography and Network Security | Atul Kahate | Tata McGraw Hill |
| 2 | Computer Security Principles and Practices | William Stallings, Lawrie Brown | Pearson Education |
| 3 | Computer Security (Second Edition) | Dieter Gollman | Wiley India Education |
| 4 | Cryptography and Security | C K Shyamala, N Harini | Wiley India |
| 5 | Introduction to Computer Security | Matt Bishop | Addison-Wesley |

### B) Software/Learning Websites

1. http://www.pgpi.org/doc/pgpintro
2. http://www.emailtrackerpro.com
3. http://www.kmint21.com
4. http://www.jjtc.com/Steganography/tools.html

**C) Major Equipment/ Instrument with Broad Specifications**

| Sr.No. | Equipment/ Instrument | Specification |
|---|---|---|
| 1. | Desktop Computer | Processor: PIV or above<br>HDD: 40GB Min<br>RAM: 2GB or above<br>OS: 32 bit or 64 bit |
| 2. | Programming Language | C or Java or.NET |
| 3. | Open Source tools for Security | Cryptool |

**10.0 MAPPING MATRIX OF PO'S AND CO'S:**

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | **a** | **b** | **c** | **d** | **e** | **f** | **g** | **h** | **i** | **j** | **k** |
| CO1 | H | H | | | | | | | | | L |
| CO2 | | | H | | M | | L | | | | |
| CO3 | | H | H | H | | | | M | | L | |
| CO4 | | H | | | L | | | | | M | |
| CO5 | H | | | | | M | | | H | | |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME :** Diploma Programme in Computer Technology (CM)
**COURSE :** Microcontroller and Embedded Systems (MCE) **COURSE CODE :** 6550

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 03 | -- | 04 | 07 | 03 | Max. | 80 | 20 | 100 | -- | 25 | 25 | 150 |
| | | | | | Min. | 32 | -- | 40 | -- | 10 | 10 | -- |

## 1.0 RATIONALE:

Now a day, we are surrounded with most of the embedded systems such as microwave oven, washing machine, DVD Player, Mobile Phone, I-Pod so on. In the earlier days, the embedded systems were designed using microprocessors, microcontrollers. The advent in last few years of technology that embeds low level and high level processing hardware elements and Application Specific Processor in to single chip has given the added dimension to the embedded system that are multiprocessor system on a single VLSI chip called as System On Chip (SOC)and are smart as well as highly sophisticated. Embedded System deals with computer hardware with software embedded in it. This course will introduce the 8051 microcontroller architecture, hardware overview of 8051, memory organization, instruction set, interrupts, timers, I/O ports, Serial communication protocols and embedded system, Real Time Operating System (RTOS).

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Describe architecture and operation of microcontroller 8051.
2. Develop assembly language programs using instruction set of 8051.
3. Interface peripheral with microcontroller 8051.
4. Realise the basic concept of embedded system and Real time operating system.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Develop and execute assembly language program for specific application.
2. Interface input/output peripherals with microcontroller 8051.
3. Develop small microcontroller based application.
4. Compare and select appropriate processor or microcontroller for specific embedded application.
5. Select the appropriate hardware configuration for the particular embedded application, realize the concept of embedded system and Design hardware of the embedded system.
6. Realize the basic concept of real time operating system and their uses in embedded system.

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**8051 Microcontroller** | 1a. State features of 8051 microcontroller.<br>1b. Draw pin diagram and architecture of 8051.<br>1c. Explain pin functions and architecture of 8051. | 1.1 Introduction to 8051 family Microcontroller<br>1.2 Features and Pin diagram with function of all pins of 8051.<br>1.3 Architecture of 8051.<br>1.4 Function of program counter and data pointer, A and B registers, Program | 08 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | 1d. Interface external memory with microcontroller.<br>1e. Draw internal port structure of 8051.<br>1f. Explain operation of input/output ports of 8051. | status word (PSW) register, concept of Stack and stack pointer register, List of special function registers with address<br>1.5 Internal Memory: Concept and Structure of 128 byte internal RAM, Structure of 4kb EPROM.<br>1.6 Connections of External Memory.<br>1.7 Port Structure: Internal diagram and working of all four ports. | |
| **Unit-II**<br><br>**Addressing modes and instruction set** | 2a. **Define** addressing modes of instructions.<br>2b. Explain functions of all assembly instructions of 8051.<br>2c. Develop assembly language program for different operations. | 2.1 8051 Addressing modes-Definition and types.<br>2.2 Assembly language instruction format.<br>2.3 8051 Instruction Set-Data transfer, Arithmetic, Logical, Branch-jump & Call Instructions, Boolean variable manipulation instructions.<br>2.4 Simple Programming<br>2.5 8-bit addition, subtraction, multiplication, division (using external memory) largest number, ascending order, block transfer (external to internal memory), to find even and odd numbers,1's,2's complement. | 10 |
| **Unit-III**<br><br>**SFR format & programming** | 3a. Draw format of all special function registers.<br>3b. Explain function of each bit of each special function register.<br>3c. Write program to generate a square waveform.<br>3d. Explain serial communication with simple program<br>3e. Explain power saving options of microcontroller. | 3.1 Interrupts- IE and IP SFRs study.<br>3.2 Study of Timer SFR's (TMOD, TCON, TLX, THX)<br>3.3 Timer modes of 8051<br>3.4 Programming of 8051 timers-Generation of square wave using timer modes, calculation of count and assembly program.<br>3.5 Serial communication. (SCON), simple program for serial communication.<br>3.6 Power saving mode of 8051 study of PCON | 10 |
| **Unit-IV**<br><br>**Peripheral Interfacing and Programming** | 4a. Interface peripheral with 8051 such as, DAC, , LEDs, 7-segment,LCD<br>4b. Explain interfacing of peripheral with 8051 such as DAC, LEDs, 7-segment,LCD<br>4c. Develop assembly language program to use peripheral with 8051 such as, DAC, LEDs, 7-segment,LCD | 4.1 DAC 0808 Interfacing -Generation of Square wave, Triangular wave, Saw tooth, staircase wave.<br>4.2 Interfacing & programming of LEDs.<br>4.3 Interfacing and programming of 7-segment.<br>4.4 Interfacing and programming of LCD 16X2.<br>4.5 Interfacing and programming of. | 06 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-V**<br><br>**Basics of Embedded System** | 5a. Define embedded system and categories it<br>5b. Explain recent trends in embedded system and its specialties<br>5c. Draw hardware, software architecture of embedded system and explain it<br>5d. Sate different software and hardware development tools with development cycle. | 5.1 Embedded system: Definition, Categories, Overview, Specialties, Recent trends<br>5.2 Hardware architecture: CPU, Memory, Clock, timer, I/Os, USART<br>5.3 Software Architecture: OS services, Architecture, categories, software application, communication software.<br>5.4 Software & Hardware development tools , IDE, Compiler, Debugger, Simulator, Emulator, In circuit Emulator(ICE), Target Board, Device Programme<br>5.5 Embedded software development cycle<br>5.6 Embedded application: Digital camera. | 08 |
| **Unit-VI**<br><br>**Operating systems Concepts And RTOS** | 6a. State the different components of operating system.<br>6b. Draw architecture of RTOS and explain it.<br>6c. Explain scheduling algorithms of operating system. | 6.1 Components of OS: Tasks, Task states, task and data, semaphore and shared data, massage Queues, Concept of Starvation, Deadlock, Multitasking,<br>6.2 Scheduling Algorithms<br>6.3 Introduction to RTOS: Concept of RTOS, RTOS Architecture, Requirement, Need, Specification of RTOS in Embedded systems.<br>6.4 RTOS Application: Underground Tank Monitoring system | 06 |
| | | **TOTAL** | **48** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

| Unit No. | Unit Title | Hours | Distribution of Theory Marks | | | |
|---|---|---|---|---|---|---|
| | | | R Level | U Level | A Level | Total Marks |
| I | 8051 Microcontroller | 08 | 04 | 08 | - | 12 |
| II | Addressing modes and instruction set | 10 | 06 | 04 | - | 10 |
| III | SFR format & programming | 10 | 04 | 04 | 08 | 16 |
| IV | Peripheral Interfacing and Programming | 06 | - | 08 | 08 | 16 |
| V | Basics of Embedded System | 08 | 06 | 08 | - | 14 |
| VI | Operating systems Concepts And RTOS | 06 | 04 | 08 | - | 12 |
| | **TOTAL** | **48** | **24** | **40** | **16** | **80** |

**Legends:** R = Remembrance (Knowledge); U= Understanding; A= Application and above levels (Revised Bloom's taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignments/tasks should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the competencies.

***Note****: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of* ***Programme Outcomes/Course Outcomes in affective domain*** *as given in a common list*

*at the beginning of curriculum document for this programme. Faculty should refer to that common list and should ensure that students also acquire those Programme Outcomes/Course Outcomes related to affective domain.*

| S. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Approx. Hrs. required |
|---|---|---|---|
| 1 | I | Observe architecture of 8051 and identify Pin configuration of it. | 02 |
| 2 | II | Develop and execute assembly program using simulator 8-bit addition and 8-bit subtraction. | 04 |
| 3 | | Develop and execute assembly program using for 1's and 2's complement of 8 bit. | 04 |
| 4 | II | Develop and execute assembly program using simulator 8-bit Multiplication. | 04 |
| 5 | II | Develop and execute assembly program using simulator and 8-bit Division. | 04 |
| 6 | II | Develop and execute assembly program to find largest number from group of 10 numbers using simulator. | 02 |
| 7 | II | Develop and execute assembly program to find smallest number from group of 10 numbers using simulator. | 02 |
| 8 | II | Develop and execute assembly program to find Even and odd number from group of 10 numbers using simulator (two separate programs) | 04 |
| 9 | II | Develop and execute assembly program to arrange 05 numbers in descending using simulator. | 02 |
| 10 | II | Develop and execute assembly program to arrange 05 numbers in ascending using simulator | 02 |
| 11 | II | Develop and execute assembly program to transfer 10 numbers from external memory to internal memory using simulator. | 02 |
| 12 | II | Develop and execute assembly program to transfer 10 numbers from external memory to external memory (overlapped) using simulator. | 02 |
| 13 | II | Develop, execute and download on kit assembly program to generate square waveform using internal timers. | 02 |
| 14 | IV | Develop, execute and download on kit assembly program to interface and blink LEDs on I/O ports.(two different patterns of blinking) | 04 |
| 15 | IV | Develop, execute and download on kit assembly program to interface 7-segment and display 0-9 on ot. | 04 |
| 16 | IV | Develop and execute and download on kit assembly program to interface DAC0808 and generate, Square wave, triangular wave. | 06 |
| 17 | IV | Develop, execute and download on kit assembly program to interface (16x2) LCD and display 'WELCOME 'message on it. | 06 |
| 18 | V | Case study on embedded application Digital Camera (Hardware) | 04 |
| 19 | VI | Case study on Real time embedded application Underground Tank Monitoring system | 04 |
| **TOTAL** | | | **64** |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like:

1. Prepare a chart of architecture of 8051.
2. Prepare a chart showing all instructions of 8051.
3. Prepare journals based on practical performed in microcontroller 8051 and embedded system laboratory.
4. Develop mini projects.

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. Show video/animation film to demonstrate the working of microcontroller.

2. Arrange expert lecture of a person in the area of Microcontroller, embedded system.
3. Arrange visit to relevant industry.
4. Arrange one day workshop on 8051 microcontroller.

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | The 8051 Microcontroller Architecture, Programming and Application | Kennneth J. Ayala | Thomson & Delmar Learning. (PRI), Second Edition. |
| 2 | The 8051 Microcontroller and Embedded systems | Mazidi, Mazidi & Mckinlay | Pearson Publication, Second Edition. |
| 3 | Microcontrollers | Ajay Deshmukh | Tata-McGraw Hill Publication, first Edition. |
| 4 | Programming and customizing the 8051 microcontroller | Myke Predko | Tata-McGraw Hill Publication 1999. |
| 5 | Embedded System Design | Frank Vahid | John Willy 2002 |
| 6 | Embedded Real Time System Concepts, design &Programming | V. K. Prasad | Dreamtech 2013 ISBN 978-81-7722-461-0 |
| 7 | Embedded Real Time Systems Programming | Sriram V. Iyer, Gupta | Tata McGraw Hill, Education 2003 ISBN-9780071331128 |
| 8 | Embedded System | Raj Kamal | Tata McGraw Hill, Education 2012 ISBN-10-0-07-066764-0 |
| 9 | An Embedded Software Primer | David Simon | Pearson 2003 ISBN=8177581546 |

### B) Software/Learning Websites

1. www.8052.com
2. www.nptel.iitm.ac.in
3. http://www.embeddedindia.com/
4. http://www.esacademy.com/
5. www.embeddedtechjournal.com

### C) Major Equipment/ Instrument with Broad Specifications

| Sr.No. | Name of Equipment/ Instrument | Broad Specifications |
|---|---|---|
| 1 | 8051 development board | Having on board interfacing of all basic peripherals. |
| 2 | Simulator (Web version) | |
| 3 | Computer system | Latest version |

## 10.0 MAPPING MATRIX OF PO'S AND CO'S:

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i | j | k |
| CO1 | M | H | L | | | | | | | | |
| CO2 | H | M | L | | | | | | | | |
| CO3 | | | L | H | | | M | | | | |
| CO4 | M | | | | L | | H | | | | |
| CO5 | L | M | | | | | H | | | | |
| CO6 | H | M | L | | | | | | | | |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

**PROGRAMME** : Diploma Programme in Computer Technology (CM)
**COURSE** : Computer Graphics (CGR) **COURSE CODE :** 6551

**TEACHING AND EXAMINATION SCHEME:**

| Teaching Scheme | | | | Examination Scheme | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hrs / week | | | Credits | TH Paper Hrs. | Marks | | | | | | |
| TH | TU | PR | | | | TH | TEST | TH+TEST | PR | OR | TW | TOTAL |
| 02 | -- | 02 | 04 | -- | Max. | -- | -- | -- | -- | 25 | 25 | 50 |
| | | | | | Min. | -- | -- | -- | -- | 10 | 10 | -- |

## 1.0 RATIONALE:

The aim of Computer Graphics course to study the techniques to improve communication between human and machine. Computer Graphics is one of the most existing, rapidly growing computer fields. The word Computer Graphics means pictures, graphics or scene drawn with the help of a computer system. After studying this course, a learner will be able to work with 2-dimensional, 3-dimensional graphics, multimedia and animation techniques. It is also useful in many fields such as Engineering drawing, graphics, architectural design, video games and animations.

## 2.0 COURSE OBJECTIVES:

The student will be able to,

1. Involve in design and development of graphics and animations found in media, entertainment, sciences and engineering.
2. Apply basic elements of graphics to perform operations of translation, scaling, rotation of 2D and 3D objects.
3. Develop interactive graphics interface and prepare media elements for applications.

## 3.0 COURSE OUTCOMES:

The course content should be taught and learning imparted in such a manner that students are able to acquire required learning outcome in cognitive, psychomotor and affective domain to demonstrate following course outcomes:

1. Describe file structure of display & graphics file formats.
2. Apply the algorithms to draw lines, circles and polygons.
3. Use transformation techniques to scale, rotate and translate the object.
4. Select the methods of enlarging visible portion of drawing
5. Develop the logic for drawing the natural objects using different algorithms for curved lines.
6. Describe the fundamentals of raster graphics and interactive graphics.

## 4.0 COURSE DETAILS:

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| **Unit-I**<br><br>**Basics of Computer Graphics** | 1a. Identify need of computer graphics.<br>1b. Describe various applications of computer graphics. | 1.1 Computer Graphics<br>1.2 Display Devices:<br>• CRT<br>• Random Scan CRT<br>• Raster Scan CRT<br>• Color CRT monitor<br>• Direct View Storage Tube (DVST)<br>• Flat Panel Display<br>• Liquid Crystal Display (LCD)<br>1.3 Primitive Operations<br>1.4 Display File Interpreter | 08 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | | 1.5 Display File Structure<br>1.6 Graphics File Format: BMP, GIF, JPEG, PCX, TIFF<br>1.7 Graphics modes<br>• Text mode graphics functions<br>• Graphics mode functions<br>• Shapes<br>• Colors<br>1.8 Applications of computer graphics | |
| **Unit-II**<br><br>**Line, Circle and Polygon** | 2a. Draw Lines using various algorithms.<br>2b. Generate circle with various algorithms.<br>2c. Draw polygons and demonstrate their filling procedures. | 2.1 Line Drawing Algorithms:<br>• Simple line drawing<br>• algorithm<br>• Digital Differential algorithm<br>• (DDA)<br>• Bresenham's line drawing<br>• algorithm<br>2.2 Circle Drawing Algorithms:<br>• Digital Differential algorithm<br>• (DDA) circle generation<br>• algorithm<br>• Bresenham's circle<br>• generation algorithm<br>2.3 Polygons<br>• Types of polygon<br>• Representation of polygons<br>• Entering polygon<br>• Inside-Outside test<br>2.4 Polygon Filling:<br>• Scan line algorithm<br>• Flood fill algorithm | 06 |
| **Unit-III**<br><br>**Transformations** | 3a. Demonstrate 2D transformation techniques.<br>3b. Demonstrate 3D transformation techniques. | 3.1 2D Transformations:<br>• Translation<br>• Scaling<br>• Rotation<br>• Composite Transformation:<br>• Rotation about arbitrary<br>• point, Scaling about arbitrary<br>• point<br>• Other Transformation:<br>• Reflection, Shearing<br>3.2 3D transformation:<br>• Translation<br>• Scaling<br>• Rotation<br>• Rotation about arbitrary axis | 06 |
| **Unit-IV**<br><br>**Windowing and Clipping** | 4a. Summarize the different transformations.<br>4b. Operate on various clipping algorithms. | 4.1 Windowing<br>4.2 Viewing Transformation<br>• Normalization Transformation<br>• Workstation Transformation<br>4.3 Clipping:<br>• Line Clipping: Cohen-Sutherland Line clipping algorithm, Midpoint | 06 |

| Unit | Major Learning Outcomes (in cognitive domain) | Topics and Sub-topics | Hours |
|---|---|---|---|
| | | subdivision algorithm<br>• Polygon Clipping: Sutherland -- Hodgeman Polygon clipping algorithm | |
| **Unit-V**<br><br>**Curves and Fractals** | 5a. Draw various curves.<br>5b. Predict various fractal types. | 5.1 Curve Generation: Arc generation using DDA algorithm, Interpolation, Approximation, B-Spline, Bezier curves<br>5.2 Curve Fractals: Hilbert's Curve, Koch curve, Fractal lines, Fractal Surfaces. | 06 |
| | | **TOTAL** | **32** |

## 5.0 SUGGESTED SPECIFICATION TABLE WITH MARKS (THEORY):

Not Applicable

**Legends:** R = Remembrance (Knowledge); U= Understanding; A= Application and above levels (Revised Bloom's taxonomy)

**Note:** This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## 6.0 ASSIGNMENTS/PRACTICALS/TASKS:

The tutorial/practical/assignment/task should be properly designed and implemented with an attempt to develop different types of cognitive and practical skills **(Outcomes in cognitive, psychomotor and affective domain)** so that students are able to acquire the desired programme outcome/course outcome.

***Note****: Here only outcomes in psychomotor domain are listed as practical/exercises. However, if these practical/exercises are completed appropriately, they would also lead to development of* ***Programme Outcomes/Course Outcomes in affective domain*** *as given in the mapping matrix for this course. Faculty should ensure that students also acquire Programme Outcomes/Course Outcomes related to affective domain.*

| S. No. | Unit No. | Practical Exercises (Outcomes in Psychomotor Domain) | Hours. |
|---|---|---|---|
| 1 | II | Implement DDA algorithm and Bresennham's algorithm for line drawing. | 04 |
| 2 | II | Implement DDA algorithm and Bresennham's algorithm of circle drawing. | 04 |
| 3 | II | Implement Flood fill algorithm for Polygon filling. | 02 |
| 4 | II | Implement scan-line algorithm for polygon filling. | 02 |
| 5 | III | Write Program for 2-D transformations -> scaling, Rotation. | 02 |
| 6 | III | Write Program for 2 D transformations -> shearing and Translation program. | 02 |
| 7 | III | Write and implement program for rotation about an arbitrary point. | 02 |
| 8 | IV | Implement Cohen- Sutherland algorithm for line clipping. | 04 |
| 9 | IV | Implement midpoint subdivision algorithm for line clipping. | 04 |
| 10 | IV | Implement Sutherland-Hodgeman algorithm for polygon clipping. | 04 |
| 11 | V | Write a program to draw a curve using Bezier's algorithm. | 02 |
| **TOTAL** | | | 32 |

## 7.0 STUDENT ACTIVITIES:

Following is the list of proposed student activities like

1. Identify the main characteristics of basic computer graphics techniques.
2. Design and develop simple graphics algorithms.
3. Evaluate and critique different types of graphics systems.
4. Apply computer graphics techniques to real-world applications.

## 8.0 SPECIAL INSTRUCTIONAL STRATEGIES (If any):

1. The course requires both theory and practical emphasis simultaneously, so that the student can understand the practical significance of the various application areas.
2. Students will be able to learn fundamentals of graphics through practical from unit II, III and IV.
3. Students are assigned to prepare power point presentations on the various applications of computer graphics.

## 9.0 LEARNING RESOURCES:

### A) Books

| Sr.No. | Title of Book | Author | Publication |
|---|---|---|---|
| 1 | Computer Graphics 2nd Edition | Donald Hearn &M Pauline Baker | PHI Learning |
| 2 | Computer Graphics 2nd Edition | Steven Harington | McGraw Hill |
| 3 | Digital Image Processing 3rd Edition | Gonzalez & Woods | Addison Wesley |
| 4 | Computer Graphics: Principals and Practices in C 2E | James D. Foley | Pearson Education |
| 5 | Image Processing for Computer Graphics 3rd Edition | Jonas Gomes<br>Luiz Velho | Springer |

### B) Software/Learning Websites

1. http://www.cs.umd.edu/~mount/427/Lects/427lects.pdf
2. http://www.technicalsymposium.com/Computer_Graphies_1.html
3. http://www.cs.uic.edu/~jbell/CourseNotes/ComputerGraphics/2DTransforms.html
4. http://courses.cs.vt.edu/~cs4204/lectures/transformations.pdf
5. http://www.cs.utexas.edu/~fussell/courses/cs384g/lectures/lecture04-
6. Image_Processing.pdf

### C) Major Equipment/ Instrument with Broad Specifications

| Sr.No. | Equipment | Specification |
|---|---|---|
| 1 | Desktop Computer | PC Specifications to be followed:<br>Processor: i3 or i5<br>RAM: 4 GB or better<br>HDD: 1 TB SATA<br>Monitor: TFT LCD<br>OS: Genuine Windows 8 or 10 Professional or Home Premium or Windows 8 or 10 Ultimate<br>Antivirus: User License for three year |
| 2 | Turbo C/C++ | License |

## 10.0 MAPPING MATRIX OF PO'S AND CO'S:

| Course Outcomes | Programme Outcomes | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | a | b | c | d | e | f | g | h | i | j | k |
| CO1 | | H | | H | L | M | | M | | | H |
| CO2 | | H | H | M | L | | | M | | | H |
| CO3 | | H | H | M | L | | | M | | | H |
| CO4 | | | | | | | | | | | |
| CO5 | | H | H | M | | | | M | | | H |
| CO6 | | M | M | | | | | | | | H |

**H: High Relationship, M: Medium Relationship, L: Low Relationship.**

# Certificate

The curriculum of the programme has been modified in the year 2016, as per the provision made in curriculum development process of Government Polytechnic, Nashik. This is the **outcome based <u>Curriculum of Diploma in Computer Technology programme</u>**, which shall be implemented from academic year 2016-17.

Verified by

Department Level CDC Representative
Government Polytechnic, Nashik

Head of Department
Computer Technology
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Government Polytechnic, Nashik.

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Government Polytechnic, Nashik.