

MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION

Diploma Programme in **Information Technology**

I – Scheme

Programme Structure

Programme Educational Objectives (PEOs) (*What s/he will continue to do even after 3-5 years of working in the industry*)

- PEO 1. Provide socially responsible, environment friendly solutions to Information technology related broad-based problems adapting professional ethics.
- PEO 2. Adapt state-of-the-art Information Technology broad-based techniques to work in multi-disciplinary work environments.
- PEO 3. Solve broad-based problems individually and as a team member communicating effectively in the world of work.

Program Outcomes (POs) given by NBA. (*What s/he will be able to do at the entry point of industry soon after the diploma programme*)

- PO 1. **Basic knowledge:** Apply knowledge of basic mathematics, science and basic engineering to solve the problems related to application of computers and communication services in storing, manipulating and transmitting data, often in the context of a business or other enterprise.*
- PO 2. **Discipline knowledge:** Apply Information Technology knowledge to solve broad-based Information Technology related problems.*
- PO 3. **Experiments and practice:** Plan to perform experiments, practices and to use the results to solve Information Technology related problems.*
- PO 4. **Engineering tools:** Apply appropriate Information Technology related techniques/tools with an understanding of the limitations.*
- PO 5. **The engineer and society:** Assess societal, health, safety and legal issues and the consequent responsibilities relevant to practice in the field of Information technology.*
- PO 6. **Environment and sustainability:** Apply Information Technology related engineering solutions for sustainable development practices in environmental contexts.*
- PO 7. **Ethics:** Apply ethical principles for commitment to professional ethics, responsibilities and norms of practice in the field of Information Technology.*
- PO 8. **Individual and team work:** Function effectively as a leader and team member in diverse/ multidisciplinary teams.*
- PO 9. **Communication:** Communicate effectively in oral and written form.*
- PO 10. **Life-long learning:** Engage in independent and life-long learning along with the technological changes in the IT and allied industry.*

Program Specific Outcomes (PSOs) (*What s/he will be able to do in the Information Technology specific industry soon after the diploma programme*)

- PSO 1. Modern Information Technology:** Use latest technologies for operation and application of information.
- PSO 2. Information Technology Process:** Maintain the information processes using modern information and communication technologies.

Notes for All the Semesters

1. Every student has to **separately pass in End-Semester-Examination (ESE)** for **both theory and practical** by securing minimum of 40% marks, (i.e. 30 out of 75, 28 out of 70, 20 out of 50, and 10 out of 25).
2. **Progressive Assessment (PA) for Theory** includes Written Exam/micro projects/ Assignment/Quiz/Presentations/attendance according to the nature of the course. The scheme and schedule for progressive assessment should be informed to the students and discussed with them at the start of the term. This scheme should also be informed in writing to the principal of the institute.
3. Teachers need to give **marks judiciously for PA of theory and practicals** so that there is always a **reasonable correlation** between the **ESE marks** obtained by the student and the **PA marks** given by **respective teachers for the same student**. In case the PA marks in some courses of some students seems to be relatively inflated in comparison to ESE marks, then MSBTE may review the PA records of such students.
4. For developing self-directed learning skills, from each course about 15-20% of the topics/sub-topics, which are relatively simpler or descriptive in nature are to be given to the students for self-study and proper learning of these topics should be assured through classroom presentations by students (see implementation guideline for details).

Programme Code: I – Scheme Diploma Programme in Information Technology												
I – Semester												
Weighted mean score	S. No. & (Rank No.) of Report	Industry Questionnaire S.No.	Course Title	Teaching Scheme/Week			Credits (L+T +P)	Examination Scheme				
				L	T	P		Theory		Practical		Grand Total
								ESE	PA	ESE	PA	
3.34	G2(2)	37	English (Common to all)	3	-	2+	5	70	30*	25	25	150
2.79	26(21)	1	Basic Science	2	-	2	4	35	15*	25	25	200
2.21	35(30)	2	(Common to all) Chemistry	2	-	2	4	35	15*	25	25	
2.81	24(20)	4	Basic Mathematics (Common to all)	4	2	-	6	70	30*	-	-	100
3.22	G4(4)	45	Fundamentals of ICT (Common to all)	2#	-	2	4	-	-	25	25 ⁻¹	50
2.97	15(13)	6	Engineering Graphics non-Mech.Gp.(EJ, DE, IE, IS, MU, CO, IF)	2#	-	4	6	-	-	50	50 ⁻²	100
3.24	3(2)	11	Workshop Practice Comp. Gp.(CO, IF)	-	-	4	4	-	-	50	50 ⁻²	100
Total				15	2	16	33	210	90	200	200	700

(#):No theory Exam; (*): Under the theory PA; Out of 30 marks, 10 marks is for micro-project assessment (5 marks each for Physics and Chemistry) to facilitate attainment of COs and the remaining 20 marks for tests and assignments given by the teacher; (+): Language Lab Practical (-):For the courses having ONLY practical examination, the PA has two parts – marks, for⁻¹ (i) practical part - 15 marks(60%) (ii) micro-project part - 10 marks (40%) and for⁻² (i) practical part - 30 marks (60%) (ii) micro-project part - 20 marks (40%).

Legends

L: Lecture **T:** Tutorial **P:** Practical **ESE:** End Semester Exam **PA:** Progressive Assessment

Note: Blue highlights are courses common to all programmes and yellow highlights are courses common with other specific programmes.

Programme Code: I – Scheme Diploma Programme in Information Technology												
II – Semester												
Weighted mean score	S. No. & (Rank No.) of Report	Industry Questionnaire S.No.	Course Title	Teaching Scheme/Week			Credits (L+T+P)	Examination Scheme				
				L	T	P		Theory		Practical		Grand Total
								ESE	PA	ESE	PA	
2.72	24(14)	2	Applied Mathematics Comp. Gp. (CO, IF)	4	2	-	6	70	30*	-	-	100
2.52	27(16)	7	Basic Electronics Comp. Gp. (CO, IF)	3	-	2	5	70	30*	25	25	150
2.83	G4(4)	39	Elements of Electrical Engineering Elx. Gp. (DE, EJ, IE, IS, CO, IF)	4	-	2	6	70	30*	25	25	150
3.17	8(6)	4	Programming in 'C' Comp. Gp. (CO, IF)	3	2	2	7	70	30*	25	25	150
2.86	21(12)	12	Computer Peripheral and Hardware Maintenance Comp. Gp. (CO, IF)	2#	-	2	4	-	-	50@	50~ ²	100
3.34	2(2)	8	Web Page Designing with HTML Comp. Gp. (CO, IF)	2#	-	2	4	-	-	50	50~ ²	100
2.31	G9(9)	36	Business Communication Using Computers (Common to all)	2\$	-	-	2	35\$	15	-	-	50
Total				20	4	10	34	315	135	175	175	800

(#):No theory Exam; (\$):Online Exam; (*): Under the theory PA; Out of 30 marks, 10 marks of theory PA is for micro-project assessment to facilitate attainment of COs and the remaining 20 marks is for tests and assignments given by the teacher; (#):No theory Exam; (~²): For the courses having ONLY practical, the PA has two parts (i) practical part - 30 marks (60%) (ii) micro-project part - 20 marks (40%), @: with external examiner.

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Semester – III												
Weighted mean score	S. No. & (Rank No.) of Report	Industry Questionnaire S.No.	Course Title	Teaching Scheme/Week			Credits (L+T+P)	Examination Scheme				
				L	T	P		Theory		Practical		Grand Total
								ESE	PA	ESE	PA	
3.10	14(8)	15	Object Oriented Programming using C++ Comp. Gp. (CO, IF)	3	2	2	7	70	30*	25	25	150
3.21	06(5)	9	Data structure using 'C' Comp. Gp. (CO, IF)	3	-	2	5	70	30*	25	25	150
3.41	01(1)	10	Principles of Database	3	-	2	5	70	30*	25	25	150
2.69	26(15)	24	Applied Multimedia Techniques	2#	-	4	6	-	-	50	50~ ²	100
2.86	20(12)	18	Data Communication	3	-	-	3	70	30*	-	-	100
2.17	31(19)	14	Digital Techniques and Microprocessor	4	-	2	6	70	30*	25	25	150
Total				18	2	12	32	350	150	150	150	800

(#):No theory Exam; (*): Under the theory PA; Out of 30 marks, 10 marks of theory PA is for micro-project assessment to facilitate attainment of COs and the remaining 20 marks is for tests and assignments given by the teacher; (~²): For the courses having ONLY practical, the PA has two parts (i) practical part - 30 marks (60%) (ii) micro-project part - 20 marks (40%).

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IV – Semester												
Weighted mean score	S. No. & (Rank No.) of Report	Industry Questionnaire S.No.	Course Title	Teaching Scheme/Week			Credits (L+T+P)	Examination Scheme				
				L	T	P		Theory		Practical		Grand Total
								ESE	PA	ESE	PA	
FF	-	-	Environmental and Sustainable Energy Technologies Comp. Gp. (CO, IF)	3	-	2	5	70	30*	25	25	150
3.17	9(6)	20	Java Programming Comp. Gp. (CO, IF)	3	-	4	7	70	30*	50	50	200
3.14 2.55	11(7), G8(8)	22 38	Software Engineering Comp. Gp. (CO, IF)	3	-	2	5	70	30*	25	25	150
3.10	13(8)	27	GUI Application development using VB.net Comp. Gp. (CO, IF)	2#	-	4	6	-	-	50	50~ ²	100
3.41	01(1)	10	Database Management	3	-	4	7	70	30*	50	50	200
3.07	10(7)	23	Computer Network	3	-	2	5	70	30*	25	25	150
Total				17	-	18	35	350	150	225	225	950

(#):No theory Exam; (*): Under the theory PA; Out of 30 marks, 10 marks of theory PA is for micro-project assessment to facilitate attainment of COs and the remaining 20 marks is for tests and assignments given by the teacher; (#):No theory Exam; (~²): For the courses having ONLY practical, the PA has two parts (i) practical part - 30 marks (60%) (ii) micro-project part - 20 marks (40%).

Note

- During Summer Break after IV semester (i.e. between IV and V Semester), Polytechnics would ensure mandatory placement of students for 6 weeks industrial training. Preferably, the industry where students would be placed should be large or medium scale, however if such industries are not available, then students can also be placed in small or very small industries but it should be relevant to the branch or discipline of engineering. **This training would be evaluated during V semester.**
- The allotment of the group of students and orientation for industrial training shall be done before the end of IV semester.
- Students should prepare report of training, which will be evaluated during V semester.

Programme Code: I – Scheme Diploma Programme in Information Technology												
V – Semester												
Weighted mean score	S. No. & (Rank No.) of Report	Industry Questionnaire S.No.	Course Title	Teaching Scheme/Week			Credits (L+T+P)	Examination Scheme				
				L	T	P		Theory		Practical		Grand Total
								ESE	PA	ES	PA	
MSBTE guidelines and industry feedback			Industrial Training (During Summer Break after IV Semester)	-	-	6^	6^	-	-	75	75	150
3.1	12(8)	17	Operating System (CO, IF) Comp. Gp.	3	-	2	5	70	30*	25	25	150
3.14	10(7)	23	Advanced Java Programming Comp. Gp. (CE, IF)	4	-	4	8	70	30*	50	50	200
			Elective -I	3	-	2	5	70	30*	25	25	150
2.62	G7(7)	35	Entrepreneurship Development (Common to all)	2\$	-	2	4	50	-	25	25~ ¹	100
			Minor project (Common to all)	-	-	4	4	-	-	50	50	100
Total				12	-	20^	32^	260	90	250	250	850

(\$):Online Exam; (*): Under the theory PA; Out of 30 marks, 10 marks of theory PA is for micro-project assessment to facilitate attainment of COs and the remaining 20 marks is for tests and assignments given by the teacher; (\$): Online Theory Exam; (^): Though 6 credits are allocated for Industrial Training it is only for

awarding marks. As far as teaching load/time table preparation is considered, each faculty would be assigned with one batch of students (equivalent to practical batch size) for guiding the preparation of industrial training report and its evaluation. For this purpose 1 hour (or two hours on working Saturdays) teaching load would be considered.

Note

- a) Evaluation of industrial training and its reports is to be done during this semester. Credits of Industrial Training will not affect the framing of the time table.
- b) Students have to choose any one elective group in V semester as **stream specific specialisation**, and have to take first course of that group as elective- I in V semester. They would be required to take another two courses of the same group/stream in VI semester as elective - II and elective - III. Their major and minor projects should also have emphasis preferably on the same stream of specialisation.

Weighted mean score	S. No. & (Rank No.) of Report	Industry Questionnaire S. No.	Group Number and Name of Specialization
			Group A – Web Development
3.31	3(3)	26	Elective I - Client side scripting using Java Script (CO, IF)
			Group B – Network Security and Digital Forensic
2.83	22(13)	29	Elective I - Advanced Computer Network
			Group C – Cloud Infrastructure Maintenance
3.10	12(8)	17	Elective I - Linux Operating system

Programme Code: I – Scheme Diploma Programme in Information Technology													
VI – Semester													
Weighted mean score	S. No. & (Rank No.) of Report	Industry Questionnaire S. No.	Course Title	Teaching Scheme/Week			Credits (L+T +P)	Examination Scheme					
				L	T	P		Theory		Practical		Grand Total	
								ESE	PA	ESE	PA		
3.21	7(5)	5	Mobile application Development (CO, IF)	4	-	4	8	70	30*	50	50	200	
2.72	25(14)	28	Wireless and Mobile Networks	4	-	2	6	70	30*	25	25	150	
		IF	Elective –II	3	-	2	5	70	30*	25	25	150	
		IF	Elective – III	3	-	2	5	70	30*	25	25	150	
3.21	G3(3)	32	Technical Writing (Common to all)	-	-	2	2	-	-	25	25	50	
			Major Project (Common to all)	-	-	6	6	-	-	75	75	150	
			Total	14	-	18	32	280	120	225	225	850	

(*): Under the theory PA; Out of 30 marks, 10 marks of theory PA is for micro-project assessment to facilitate attainment of COs and the remaining 20 marks is for tests and assignments given by the teacher.

Note

- a) The **Technical Writing** course is introduced as practical work, in which English faculty members would facilitate the framing of correct language for writing different chapters and presentation (i.e.PPT. and others) of their project work from English point of view. Name of English teacher has to be included as a 'Language Editor' in the project and this activity will be the part of practical shown against Technical Writing course at VI semester. This work shall be carried out for each batch (size same as for practical).
- b) Students who have chosen the **stream specific specialisation** in elective – I in V semester, should choose the same stream/group courses in elective – II and elective – III in VI semester. Their **major project** should also have emphasis preferably on the same group/stream which could further sharpen their skills in that area.

Weighted mean score	S. No. & (Rank No.) of Report	Industry Questionnaire S. No.	Group Number and Name of Specialization
			Group A – Web Development
3.31	3(3)	26	Elective II - Server Side Scripting Using JSP (CO, IF)
3.24	4(4) IF(1)	25	Elective III - (Choose any one) 1) Web based Application development with PHP (CO, IF) 2) Web based Application development with PERL (CO, IF) 3) Web based Application development with Python (CO, IF)
			Group B – Network Security and Digital Forensic
	IF (1)		Elective II - Computer and Network Security (CO, IF)
IF	IF	IF	Elective III - Digital Forensic and Hacking Techniques (CO, IF)
			Group C – Cloud Infrastructure Maintenance
	IF	-	Elective II - Cloud computing
	IF		Elective III - Cloud Security

IF: Industrial Feedback; FF: Faculty Feedback

I – Scheme Summary of Teaching Scheme/Week, Credits and Examination Scheme

Information Technology

Semester	Teaching Scheme/Week			Credits (L+T+P)	Examination Scheme				
	L	T	P		Theory		Practical		Grand Total
					ESE	PA	ESE	PA	
I	15	2	16	33	210	90	200	200	700
II	20	4	10	34	315	135	175	175	800
III	18	2	12	32	350	150	150	150	800
IV	17	-	18	35	350	150	225	225	950
V	12	-	20	32 [^]	260	90	250	250	850
VI	14	-	18	32	280	120	225	225	850
Total	96	08	94	198[^]	1765	735	1225	1225	4950

([^]): This includes total 6 credits for Industrial Training conducted during Summer Break between IV and V semester.

