Society for Computer Technology & Research's (SCTR's)

Pune Institute of Computer Technology (PICT), Pune

An Autonomous Institute affiliated to the Savitribai Phule Pune University (SPPU)
Approved by AICTE & Government of Maharashtra,
Accredited by NAAC (A+) & NBA [All eligible UG Programs]

Syllabus for
B. Tech Electronics and Computer Engineering (E&CE)
(A.Y. 2027-28 onwards) *

With effect from (June 25)
National Education Policy (NEP) 2020 Compliant
*Approved by the Board of Studies (BoS) and Academic Council

Abbreviations used (Refer [1-3] for more details)

Sr. No.	Broad Category of the course	Sub- Category of course	Category Code
I.	Basic Science/ Engineering Science Course (BSC/ ESC)	Basic Science Course (BSC)	01
		Engineering Science Course (ESC)	02
II.	Program Courses (PC)	Program Core Course (PCC)	03
		Program Elective Course (PEC)	04
III.	Multidisciplinary Courses (MC)	Multidisciplinary Minor (MDM)	05
		Open Elective (OE) Other than particular program	06
IV.	Skill Courses (SC)	Vocational and Skill Enhancement Course (VSEC)	07
V.	Humanities Social Science and Management (HSSM)	Ability Enhancement Course (AEC-01, AEC-02)	08
		Entrepreneurship/Economics/ Management Courses (EEM)	09
		Indian Knowledge System (IKS)	10
		Value Education Course (VEC)	11
VI.	Experiential Learning Courses (ELC)	Research Methodology (RM)	12
		Community Engagement Project (CEP) / Field Project (FP)	13
		Project (PRJ)	14
		Internship/ On Job Training (IP/OJT)	15
VII.	Liberal Learning Courses (LLC)	Co-curricular Activities (CCA)	16

Detailed guidelines for General Instructions:

Link: General Instructions

Detailed guidelines for Evaluation and Assessment:

Link: Guidelines for Evaluation and Assessment

Detailed guidelines for examination:

Link: Guidelines for examination

Index

Contents

B. Tech Syllabus Structure
Semester – VII/VIII

Semester -7/8			Teaching Scheme (Hours/Week)				Credit scheme				Examination/ Evaluation Scheme and Marks						
Category of Course	Course code	Name of the Course	L	P	T	Total	L	P	T	Total	Theory			Practical			Total
											ISE [20]	CIE [20]	ESE [60]	CIE TW	ESE P	OR	
RM	0712301	Research Methodology (RM) *	-	-	2	**2**	-	-	2	**2**	-	-	25	-	-	-	**25**
RM	0712302	Academic Research Writing (ARC)	-	-	1	**1**	-	-	1	**1**	-	-	-	25	-	-	**25**
PCC	5703122	Software Testing and Quality Assurance (STQA)	2	-	-	**2**	2	-	-	**2**	20	20	60	-	-	-	**100**
PCC	5703223	Software Testing and Quality Assurance Lab (STQAL)	-	2	-	**2**	-	1	-	**1**	-	-	-	25	25	-	**50**
PCC	5703124	Cloud Computing (CC)	2	-	-	**2**	2	-	-	**2**	20	20	60	-	-	-	**100**
PCC	5703225	Cloud Computing Lab (CCL)	-	2	-	**2**	-	1	-	**1**	-	-	-	25	25	-	**50**
PEC	57041X3	Program Elective-III	3	-	-	**3**	3	-	-	**3**	20	20	60	-	-	-	**100**
PEC	57042X3	Program Elective-III Lab	-	2	-	**2**	-	1	-	**1**	-	-	-	-	25	-	**25**
PEC	57041X4	Program Elective-IV	3	-	1	**4**	3	-	1	**4**	20	20	60	25	-	-	**125**
PRJ	0714201	Project work Phase-I/II	-	6	-	**6**	-	3	-	**3**	-	-	-	50	-	50	**100**
		Total	**12**	**12**	**2**	**26**	**12**	**6**	**2**	**20**	**80**	**80**	**265**	**150**	**75**	**50**	**700**

Program Elective Courses-III (PEC-III)			Program Elective Courses-IV (PEC-IV)	
Domain Name	Course Code	Course name	Course Code	Course name
Electronics (E)	5704113	Robotics and Automation (RA)	5704114	Electric Vehicle (EV)
Computers (C)	5704123	Game Development (GD)	5704124	Blockchain Computing
Emerging Trends (ET)	5704133	Human Computer Interaction (HCI)	5704134	Wearable and Biosensor Technology (WBT)
Advance Data Science (ADS)	5704143	Optimization Techniques (OT)	5704144	Explainable AI (EAI)
Cyber Security (CS)	5704153	Cyber Security and Ethical Hacking (CSEH)	5704154	Software and Hardware Security (SHS)

B. Tech, Semester – VII/VIII

Category of Course	Course code	Name of the Course	L	P	T	Total	L	P	T	Total	ISE [20]	CIE [20]	ESE [60]	CIE TW	P	ESE OR	Total
Semester-7/8			**Teaching Scheme (Hours/Week)**				**Credit scheme**				**Examination/ Evaluation Scheme and Marks**						
											Theory			Practical			
IP	0815201	Internship	-	22	-	**22**	-	11	-	**11**	-	-	-	150	-	100	**250**
MDM	08053X5	MDM 5#	-	-	2	**2**	-	-	2	**2**	-	-	-	50	-	-	**50**
PRJ	0814202	Project work Phase-I/II	-	6	-	**6**	-	3	-	**3**	-	-	-	50	-	50	**100**
		Total	**0**	**28**	**2**	**30**	**0**	**14**	**2**	**16**	**0**	**0**	**0**	**250**	**0**	**150**	**400**

Note: Students who opted for an internship in 7th Semester will complete the courses in the 8th semester. Students who opted for courses in the 7th semester will take an internship in their 8th semester.

Annexures

⬆ Annexure-I

Structure of Multi-Disciplinary Minor Courses

The structure for the multidisciplinary Minor courses is as follows.

Sem	Course code	Name of Course	Teaching Scheme (Hours/Week)				Credits				Examination Scheme and Marks						
			L	P	T	Total	L	P	T	Total credits	Theory			Practical			Semester
											CIE	ISE	ESE	CIE	ESE		Total
											[20]	[20]	[60]	TW	P	OR	550
3	03051X1	MDM-1	2	-	-	2	2	-	-	2	20	20	60	-	-	-	100
3	03052X1	MDM-1 #	-	2	-	2	-	1	-	1	-	-	-	-	-	25	25
4	04051X2	MDM-2	2	-	-	2	2	-	-	2	20	20	60	-	-	-	100
4	04052X2	MDM-2 #	-	2	-	2	-	1	-	1	-	-	-	25	-	-	25
5	05051X3	MDM-3	2	-	-	2	2	-	-	2	20	20	60	-	-	-	100
5	05052X3	MDM-3 #	-	2	-	2	-	1	-	1	-	-	-	25	-	-	25
6	06051X4	MDM-4	2	-	-	2	2	-	-	2	20	20	60	-	-	-	100
6	06052X4	MDM-4 #	-	2	-	2	-	1	-	1	-	-	-	25	-	-	25
8	08053X5	MDM-5	-	-	2	2	-	-	2	2	-	-	-	50	-	-	50
		Total	8	8	2	18	8	4	2	14	80	80	240	125	0	25	550

Note: In course code X is basket number. #: is laboratory or tutorial as per course requirements.

1. Students are expected to choose one of the eligible domains of MDM at the beginning of the Semester III.
2. Students will complete the chosen set of all multidisciplinary minor courses mentioned under the chosen MDM domain.
3. Students are not permitted to change from one domain to another.
4. Refer to the last column of following table for eligibility to choose a particular MDM domain.

Lis of Multi-Disciplinary Minor Domains

Label	Multi-Disciplinary Minor Domains	SY		TY		B-Tech	Offered to students of B Tech Program
		MD1-1	MD2-2	MD3-3	MD4-4	MD5-5	
		Sem-III	Sem-IV	Sem-V	Sem-VI	Sem-VII/VIII	
MD1	**Smart and Sustainable Systems (SSS)**	Fundamentals of Smart and Sustainable Systems (FSSS) & Tut	IoT for Smart and Sustainable Systems (ISSS) & Lab	Data Analytics for Smart and Sustainable Systems (DASSS) & Lab	Security for Smart and Sustainable Systems (SSS&S) Smart and Sustainable System Development (SSD) Lab	Smart and Sustainable System Development (SSD)	**ALL**
MD2	**Finance and Management (F&M)**	Fundamentals of Financial Engineering (FFE) & Tut	Banking, Financial Services and Insurance (BFSI) &Tut	Fundamentals of Stock Market (FSM) &Tut	Fintech: Foundations & Applications (FFA) &Tut	Financial Derivatives & Risk Management (FDRM)	**ALL**
MD3	3D- Printing (3DP)	3D modeling and Design (3MD) & Lab	Fundamentals of Additive Manufacturing (FAM)& Lab	3D Printing Materials and Processes (3DPMP)	Industry 4.0 and Digital Manufacturing (IDM)	Applied 3D Printing and Prototyping Lab (A3DPPL)	**ALL**
MD4	**Electric Vehicles (EV)**	EV foundation – Principles and Concepts (EVPC) & Lab	Advanced Motor Technologies and Power Electronics for EV(AMT) & Lab	EV Powertrain Dynamics and Control System (PDC) Tut/Lab	Intelligent EV Systems: AI IoT and Automation (IEV)	Capstone Project in Electric Mobility	**ALL**
MD5	**Applied Mathematics for Engineering (AME)**	Linear Algebra with Python & Lab	Statistical Techniques and Numerical Methods with R & Lab	Fuzzy Logic and Graph Theory with Matlab/Python & Lab	Optimization Techniques & Lab	Field Study/Case Study	**ALL**
MD6	**Software Development (SD)**	Data Structures and Algorithms (DSA) & Lab	Object Oriented Programming (OOP) &Lab	Database and Management Systems (DBMS) & Lab	Web Development (WD) & Lab	System Programming and Operating System (SPOS)	**Only E&TCE**
MD7	**Autonomous and Intelligent Systems (AIS)**	Digital Systems and Organization (DSO) & Lab	Smart System Engineering (SSE) & Lab	Embedded IoT Systems (EIS) & Lab	Autonomous Systems (AS) & Lab	Cyber Physical Systems: Screen Mode (CPS) / Capstone Project	**All except E&TCE**
MD8	**Embedded Systems (ES)**	Fundamental of Microcontroller (FM) & Lab	Embedded Processors –I (EP -I) & Lab	Microcontrollers and IoT (MI) & Lab	Embedded Systems and RTOS (ES-RTOS) & Lab	Capstone Project using Microcontrollers lab (CPML)	**All Except E&TCE**
MD9	AI & Machine Learning (AI-ML)	Statistical Data Analysis & Lab	Machine Learning (ML) & Lab	Natural Language Processing (NLP) & Lab	Artificial Intelligence (AI) & Lab	Deep Learning (DL)	**Only E&CE**

Link: **Detailed Syllabus**

Annexure -II

Guidelines for Open elective Courses

1. Open Elective – I will be offered in third semester as foreign language as prescribed in the structure.

2. Open Electives – II, III, IV will be offered through SWAYAM/NPTEL MOOCs of Equivalent Credits.

3. Departments shall prepare the baskets of open elective courses from discipline/faculty other than respective major programs. Students may choose any course from the basket without adhering to any one stream.

4. Credits & Grade will be awarded based on the Marks Obtained through the certification including assignments and proctored examination as per the MOOCs Policy.

Sem	Course code	Name of the Course	Teaching Scheme (Hours/Week)				Credits				Examination Scheme and Marks						Total
											Theory			Practical			
			L	P	T	Total	L	P	T	Total	CIE [20]	ISE [20]	ESE [60]	CIE TW	P	ESE OR	Total
3	OE-I	Foreign Language Studies (FLS)	-	-	2	2	-	-	2	2	-	-	-	50	-	-	50
4	OE-II	MOOCs	-	-	2	2	-	-	2	2			50	-	-	-	50
5	OE-III	MOOCs	-	-	2	2	-	-	2	2	-	-	50	-	-	-	50
6	OE-IV	MOOCs	-	-	2	2	-	-	2	2	-	-	50	-	-	-	50

Guidelines for MOOCs

1. The department shall release a list of approved SWAYAM-NPTEL courses before the commencement of every semester.
2. Students shall register for the approved Courses as per the schedule announced by SWAYAM-NPTEL.
3. A student shall undergo the courses only from the list notified by the department through SWAYAM/NPTEL platform and complete all the assignments and examination requirements as specified by SWAYAM/NPTEL.
4. SWAYAM-NPTEL Courses are considered for transfer of credits only if the student concerned has successfully completed and obtained the SWAYAM-NPTEL Certificate.
5. The credit equivalence for SWAYAM-NPTEL Courses: 12 weeks – 3credits; 8 weeks – 2 credits; 4 weeks – 1 credit.
6. Equivalent marks will be considered for awarding the grades as specified in examination rules and regulations. The weightage for assignments is 40%, while the weightage for the proctored examination will be 60% for award calculating SGPA/CGPA. Students must score a minimum of 40% of the total marks by combining both assignments and proctored examinations

7. A student must submit the original SWAYAM-NPTEL Course Certificates to the Head of the Department concerned, with a written request for the transfer of the equivalent credits. On verification of the SWAYAM-NPTEL Course Certificates and approval by the head of the department, credits will be awarded.

8. The Institute shall not reimburse any fees/expenses a student may incur for the SWAYAM-NPTEL Courses.

9. If the SWAYAM/NPTEL course calendar does not align with the institute's calendar, the department shall facilitate and conduct examination of the relevant course of equivalent credits in physical/virtual mode and award the credits accordingly.