

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 Structure for
T.Y B. Tech Artificial Intelligence (AI) and Data
Science
(AY 2025-26 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](#)

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T.Y B. Tech Syllabus Structure Semester – V

Semester -5			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
											CIE	ISE	ESE	CIE		ESE	
											[20]	[20]	[60]	TW	P	OR	
PCC	4503111	Deep Learning (DL)	3	-	-	3	3	-	-	3	20	20	60	-	-	-	100
PCC	4503212	Cloud Computing (CC)	2	-	-	2	2	-	-	2	20	20	60	-	-	-	100
PCC	4503113	Big Data Analytics (BDA)	2	-	-	2	2	-	-	2	20	20	60	-	-	-	100
PCC	4503214	Laboratory Practice-2 (LP-2)	-	4	-	4	-	2	-	2	-	-	-	50	50	-	100
PCC	4503115	Practical DevOps (PDO)	-	2	-	2	-	1	-	1	-	-	-	25	-	-	25
PEC	45041X1	Program Elective-I	3	-	1	4	3	-	1	4	20	20	60	25	-	-	125
MDM	05051X3	MDM-3	2	-	-	2	2	-	-	2	20	20	60	-	-	-	100
MDM	05053X3	MDM-3 #	-	-	1	1	-	-	1	1	-	-	-	25	-	-	25
OE	05063XX	Open Elective-III *	-	-	2	2	-	-	2	2	-	-	50	-	-	-	50
AEC	0508204	Leadership and Management Skills (LMS)	-	2	-	2	-	1	-	1	-	-	-	25	-	-	25
Total			12	8	4	24	12	4	4	20	100	100	350	150	50	0	750

L: Lecture, P: Practical, T: Tutorial, CIE: Continuous Internal Evaluation, ISE: In-Semester Examination, ESE: End-Semester Examination, TW: Term work, OR: Oral, P: Practical examination

Program Elective Courses-I (PEC-1)

Domain Name	Course Code	Course name
Architecture and Computing	4504111	Computer Architecture & Organization
Advanced Game Theory	4504121	Foundations of Game Design
Web Development	4504131	Foundations of Web Development
Cyber Security	4504141	Cybersecurity Principles
Computer Vision	4504151	Fundamentals of Computer Vision



T.Y. B. Tech, Semester - VI

Semester-6			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
											CIE	ISE	ESE	CIE	ESE		
											[20]	[20]	[60]	TW	P	OR	
PCC	4603116	Applied Artificial Intelligence (AAI)	2	-	-	2	2	-	-	2	20	20	60	-	-	-	100
PCC	4603117	Theory of Computation (ToC)	2	-	-	2	2	-	-	2	20	20	60	25	-	-	125
PCC	4603218	Applied Artificial Intelligence Lab (AAIL)	-	2	-	2	-	1	-	1	-	-	-	25	25	-	50
PEC	46041X2	Program Elective – II	3	-	1	4	3	-	1	4	20	20	60	25	-	-	125
PEC	46041X3	Program Elective – III	3	-	1	4	3	-	1	4	20	20	60	25	-	-	125
MDM	06051X4	MDM-4	2	-	-	2	2	-	-	2	20	20	60	-	-	-	100
MDM	06052X4	MDM-4 #	-	2	-	2	-	1	-	1	-	-	-	25	-	-	25
OE	06063XX	Open Elective-IV *	-	-	2	2	-	-	2	2	-	-	50	-	-	-	50
VSEC	4607204	Minor project/seminar	-	4	-	4	-	2	-	2	-	-	-	-	-	50	50
Total			12	8	4	24	12	4	4	20	100	100	350	125	25	50	750

#: Tutorial or laboratory as applicable. Choose one course from the MDM baskets. MDM: X is basket number, [Refer annexure-I](#) for MDM details.

*: Open elective (OE) offered by online platform such as SWAYAM/NPTEL, [Refer Annexure-II](#) for details.

X: Serial number of the courses under that particular category.

Domain Name	Program Elective Courses-II (PEC-II)		Program Elective Courses-III (PEC-III)	
	Course Code	Course name	Course Code	Course name
Architecture and Computing	4604112	Soft Computing	4604113	High Performance Computing
Advanced Game Theory	4604122	Strategic Decision-Making in Interactive Environments	4604123	Augmented Reality Systems and Applications
Web Development	4604132	Frontend Development Essentials	4604133	Backend Development Fundamentals
Cyber Security	4604142	Network Security Fundamentals	4604143	Application Security
Computer Vision	4604152	Image Recognition Techniques	4604153	3D Vision and Depth Perception

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	
										[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	150	0	0	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.

List 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.

			Teaching Scheme (Hours/Week)				Credits				Examination Scheme and Marks						
Sem	Course code	Name of the Course	L	P	T	Total	L	P	T	Total	Theory			Practical			Total
											CIE	ISE	ESE	CIE	ESE		
											[20]	[20]	[60]	TW	P	OR	
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.

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