School of Engineering

MIT-ADT UNIVERSITY
PUNE, INDIA
A Leap Towards World Class Education

Programme Curriculum

BACHELOR OF TECHNOLOGY

PATTERN 2021

Electronics & Computer Engineering

Faculty of Engineering

MIT ART DESIGN & TECHNOLOGY UNIVERSITY, PUNE

MIT SCHOOL OF ENGINEERING, PUNE

STRUCTURE & SYLLABUS

FOR

Bachelor of Technology
Electronics and Computer Engineering

UNDER FACULTY OF ENGINEERING

4 Year Undergraduate Program sanctioned by AC & BoS

(w.e.f. 2021-2022)

Department of Electronics and Communication Engineering

VISION

To be global leaders in the field of Electronics & Communication Engineering by offering quality education through industry collaboration, innovation, research and development to cater the needs of society with holistic approach

MISSION

- To provide quality education in the field of Electronics & Communication Engineering
- To inculcate research and innovation culture among the stake holders
- To enhance technical and inter personal skills among the students to make them employable and successful entrepreneur
- To provide ethical, spiritual and value-based education addressing the social needs

Program Educational Objectives (PEOs)

The Program Educational Objectives of B. Tech in Electronics and Computer Engineering are:

PEO 1

Graduates should demonstrate a strong foundation in the principles of electronics and computer engineering, including competence in the design, analysis, and implementation of electronic systems and computer-based solutions.

PEO 2

Graduates should be prepared for successful careers in electronics and computer engineering on the basis of professional skills, ethical conduct, and an understanding of contemporary issues in the field.

PEO 3

Graduates should be capable of expressing technical ideas clearly and concisely, both in written and oral formats.

PEO 4

Graduates should be adept at working collaboratively in multidisciplinary teams, recognizing and respecting diverse perspectives, and contributing effectively to achieve common goals.

Program Outcomes (POs)

The Program Outcomes of B. Tech in Electronics and Computer Engineering are
Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **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.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSOs)

The Program Specific Outcomes of B. Tech in Electronics and Computer Engineering are

PSO 1

Identify, formulate, and analyze engineering problems related to electronics and computer engineering domains such as Digital Systems Design, Computer Architecture, Signal Processing, Embedded Systems, Computer Networks, Computer Vision, Software Engineering using appropriate methods and tools.

PSO 2

Design solutions for complex engineering problems & carry out research in electronics and computer engineering, considering realistic constraints such as economic, environmental, ethical, health and safety, manufacturability, and sustainability

SEMESTER I

Sr. No.	Course code	Category	Subject	L	T	P	Credits	Scheme of Examination (Theory)		Scheme of Examination (Practical)		Total Marks
								CA	FE	CA	FE	
1	21BTAS102	BSC	Linear Algebra and Calculus	3	1	0	4	40	60	0	0	100
2	21BTCS101	ESC	Programming for Problem Solving	2	0	4	4	40	60	50	0	150
3	21BTEC001	ESC	Basics of Electrical and Electronics Engineering	3	0	2	4	40	60	50	0	150
4	21BTME001	ESC	Engineering Graphics	1	0	4	3	0	0	50	50	100
5	21BTAS104	HSM	English Communication for Engineers	2	0	2	3	50	0	50	0	100
6	21BTUC101	HSM	Design Thinking Part I	1	0	2	2	50	0	0	0	50
7	18UCCS102		SHD (Health Practice I)	0	0	2	1	0	0	0	0	0
			Total	**12**	**1**	**16**	**21**	**220**	**180**	**200**	**50**	**650**

SEMESTER II

Sr. No.	Course code	Category	Subject	L	T	P	Credits	Scheme of Examination (Theory)		Scheme of Examination (Practical)		Total Marks
								CA	FE	CA	FE	
1	21BTAS203	BSC	Ordinary Differential Equations and Advanced Calculus(T)	3	1	0	4	40	60	0	0	100
2	21BTCS201	ESC	Object Oriented Programming	2	0	2	3	0	60	40	0	100
3	21BTEC202	ESC	Electronics Device and Circuits	3	0	0	3	40	60	0	0	100
4	21BTAS001	BSC	Applied Sciences	4	0	2	5	40	60	50	0	150
5	21BTIC003	ESC	Engineering Workshop	0	0	4	2	0	0	50	0	50
6	21BTUC201	HSM	Design Thinking Part II	1	0	2	2	50	0	0	0	50
7	21BTEC211	DCC	Electronic Devices and Circuits Laboratory	0	0	2	1	0	0	40	60	100
8	18UCCS201	SHD	(Professional English Communication for Engineers)	1	0	2	2	0	0	0	0	0
9	18UCCS202	SHD	(Health Practice I)	0	0	2	1	0	0	0	0	0
			Total	**14**	**1**	**18**	**23**	**170**	**240**	**180**	**60**	**650**

SEMESTER III

Course Code	Course Name	Hours/week				Maximum Marks		
		Lecture	Tutorial	Practical	Credits	CA	FE	Total
21BTMT301	Integral Calculus and Transform Techniques	3	1	0	4	40	60	100
21BTEC302	Electronics Circuit Analysis	3	0	0	3	40	60	100
21BTEC303	Signals & Systems	3	1	0	4	40	60	100
21BTEC304	Digital Logic Design	3	0	0	3	40	60	100
21BTEC305	Network Theory	3	1	0	4	40	60	100
21BTEC311	Electronic Instrumentation Laboratory	0	0	2	1	40	60	100
21BTEC312	Circuit Analysis & Digital Logic Laboratory	0	0	4	2	40	60	100
21BTEC321	Mini Project –I	0	0	2	1	100	--	100
Total		**15**	**3**	**8**	**22**	**380**	**420**	**800**

SEMESTER IV

Coure Code	Course Name	Hours/week				Maximum Marks		
		Lecture	Tutorial	Practical	Credits	CA	FE	Total
21BTEC401	Data Structures and Algorithms	3	0	0	3	40	60	100
21BTCO402	System Programming and Operating System	3	0	0	3	40	60	100
21BTCO403	Analog Communication	3	0	2	4	40	60	100
21BTEC404	Computer Organization	3	0	0	3	40	60	100
21BTCO405	Data Base Management Systems	3	0	0	3	40	60	100
21BTCO411	DBMS and SPOS Laboratory	0	0	4	2	40	60	100
21BTCO412	Data Structures and Algorithms Laboratory	0	0	4	2	40	60	100
21BTEC421	Mini Project-II	0	0	2	1	100	--	100
Total		**15**	**0**	**12**	**22**	**380**	**420**	**800**

SEMESTER V

Course Code	Course Name	Hours/week				Maximum Marks		
		Lecture	Tutorial	Practical	Credits	CA	FE	Total
21BTCO501	Data Communication	4	0	0	4	40	60	100
21BTCO502	Artificial Intelligence	3	0	0	3	40	60	100
21BTCO503	Embedded System Design	3	0	0	3	40	60	100
21BTCO5[31-34]	Elective I	4	0	0	4	40	60	100
21BTCO505	Software Engineering	3	1	0	4	40	60	100
21BTCO511	Data Communication and Elective I Laboratory	0	0	4	2	40	60	100
21BTCO512	AI & ESD Laboratory	0	0	4	2	40	60	100
21BTCO521	Mini Project –III	0	0	2	1	100	--	100
Total		**17**	**1**	**10**	**23**	**380**	**420**	**800**

SEMESTER VI

Course Code	Course Name	Hours/week				Maximum Marks		
		Lecture	Tutorial	Practical	Credits	CA	FE	Total
21BTCO601	Software Testing & Quality Assurance (STQA)	4	0	0	4	40	60	100
21BTCO602	Cloud Computing	3	0	0	3	40	60	100
21BTCO603	Machine Learning	4	0	0	4	40	60	100
21BTCO604	Economics and Management for Engineers	4	0	0	4	40	60	100
21BTCO6[31-34]	Elective II	4	0	0	4	40	60	100
21BTCO611	STQA and Cloud Computing Laboratory	0	0	4	2	40	60	100
21BTCO612	Machine Learning Laboratory	0	0	2	1	40	60*	100
21BTCO621	Mini Project-IV	0	0	2	1	100	--	100
Total		**19**	**0**	**8**	**23**	**380**	**420**	**800**

SEMESTER VII

Course Code	Course Name	Hours/week				Maximum Marks		
		Lecture	Tutorial	Practical	Credits	CA	FE	Total
21BTCO701	Data Science & Application	3	0	0	3	40	60	100
21BTCO702	Natural Language Processing	3	0	0	3	40	60	100
21BTCO703	Computer Networks	3	0	0	3	40	60	100
21BTCO7[31-35]	Elective-III	4	0	0	4	40	60	100
21BTCO7[36-40]	Elective-IV	3	0	0	3	40	60	100
21BTCO711	DSA and NLP Laboratory	0	0	4	2	40	60	100
21BTCO712	Computer Networks Laboratory	0	0	2	1	40	60	100
21BTCO721	Project Phase-I	0	0	2	1	100	--	100
Total		**16**	**0**	**8**	**20**	**380**	**420**	**800**

SEMESTER VIII

Course Code	Course Name	Hours/week				Maximum Marks		
		Lecture	Tutorial	Practical	Credits	CA	FE	Total
21BTCO821	Internship and Project Phase-II	0	0	24	12	100	300	400
21BTCO801	Management Courses using online Platform	3	0	0	3	40	60	100
21BTCE851	Environmental studies (Audit Course)	2	0	0	0	-	-	-
Total		**5**	**0**	**24**	**15**	**140**	**360**	**500**

LIST OF ELECTIVES

Elective	Course Name	
Elective - I	21BTCO531	Digital Signal Processing
	21BTCO532	Internet of Things
	21BTCO533	Soft Computing
	21BTCO534	Open Electives
Electives - II	21BTCO631	Digital Image Processing
	21BTCO632	Principles of Compiler Design
	21BTCO633	Wireless Sensor Network
	21BTCO634	Open Electives
Electives - III	21BTCO731	Wireless Communication
	21BTCO732	Biomedical Signal Processing
	21BTCO733	Computer Vision
	21BTCO734	Power Electronics
	21BTCO735	Open Electives
Electives - IV	21BTCO736	Computational Intelligence
	21BTCO737	Renewable Energy systems
	21BTCO738	Audio Video Engineering
	21BTCO739	Information Security
	21BTCO740	Open Electives