ADAMAS UNIVERSITY

SCHOOL OF ENGINEERING AND TECHNOLOGY

Department of Electrical and Electronics Engineering

B.Tech (Electrical Engineering)

Course Structure and Syllabus

(2024-25)

ADAMAS UNIVERSITY, KOLKATA

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

VISION OF THE UNIVERSITY

To be an internationally recognized university through excellence in inter-disciplinary education, research and innovation, preparing socially responsible well-grounded individuals contributing to nation building.

MISSION STATEMENTS OF THE UNIVERSITY

M.S 01: Improve employability through futuristic curriculum and progressive pedagogy with cutting-edge technology.

M.S 02: Foster outcomes-based education system for continuous improvement in education, research and all allied activities.

M.S 03: Instill the notion of lifelong learning through culture of research and innovation.

M.S 04: Collaborate with industries, research centers and professional bodies to stay relevant and up-to-date.

M.S 05: Inculcate ethical principles and develop understanding of environmental and social realities.

CHANCELLOR / VICE CHANCELLOR

ADAMAS UNIVERSITY, KOLKATA

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

VISION OF THE SCHOOL

To develop well-grounded, socially responsible engineers and technocrats in a way to create a transformative impact on Indian society through continual innovation in education, research, creativity and entrepreneurship

MISSION STATEMENTS OF THE SCHOOL

M.S 01: Build a transformative educational experience through disciplinary and inter-disciplinary knowledge, problem solving, communication and leadership skills.

M.S 02: Develop a collaborative environment open to the free exchange of ideas, where research, creativity, innovation and entrepreneurship can flourish among individual students.

M.S 03: Impact society in a transformative way – regionally and nationally - by engaging with partners outside the borders of the university campus.

M.S 04: Promote outreach programs which strives to inculcate ethical standards and good character in the minds of young professionals.

DEAN / SOET

ADAMAS UNIVERSITY, KOLKATA

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

VISION OF THE DEPARTMENT

To impart quality technical education in Electrical Engineering at par with premier institutions towards excellence in domain knowledge and meet societal demands with credibility, integrity and ethics.

MISSION STATEMENTS OF THE DEPARTMENT

M.S 01: To impart quality knowledge through efficient and dedicated faculty members.

M.S 02: To steer the students to become future leaders in Electrical Engineering with broader knowledge base.

M.S 03: To become a major support system for the society with their knowledge base and dedication.

M.S 04: To inculcate professional ethics and make socially responsible engineers.

HoD, EEE

DEAN / SOET

ADAMAS UNIVERSITY,

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Name of the Programme: B.Tech (Electrical Engineering)

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PEO1: Engage in analysis and design of various power system components and their applications in the field of Electrical Engineering.

PEO2: Apply the domain knowledge of Electrical Engineering to solve problems for development of society, and/ or pursue higher education and research.

PEO3: Engage in lifelong learning and adapt to changing professional and societal needs.

HoD, EEE **DEAN / SOET**

ADAMAS UNIVERSITY, KOLKATA

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Name of the Programme: B.Tech (Electrical Engineering)

GRADUATE ATTRIBUTE / PROGRAMME OUTCOME (PO)

PO1: Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2: Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: 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.

PO4: 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.

PO5: Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: 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.

HoD, EEE

DEAN / SOET

(contd.)

ADAMAS UNIVERSITY, KOLKATA

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Name of the Programme: B.Tech (Electrical Engineering)

PO7: Environment and Sustainability: Understand the impact of professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10: Communication: Communicate effectively in 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.

PO11: 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 multidisciplinary environments.

PO12: 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.

HoD, EEE DEAN / SOET

ADAMAS UNIVERSITY, KOLKATA

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Name of the Programme: B.Tech (Electrical Engineering)

PROGRAMME SPECIFIC OUTCOME (PSO)

PSO1: To educate students in Electrical Engineering domain and guide their instincts towards.

PSO2: To provide quality knowledge on Sustainable Energy that can be used for solving problems.

PSO3: To see our students as ethical and responsible engineering professionals.

HoD, EEE

DEAN / SOET

ADAMAS UNIVERSITY

PURSUE EXCELLENCE

KOLKATA

ADAMAS UNIVERSITY

SCHOOL OF ENGINEERING AND TECHNOLOGY

Department of Electrical and Electronics Engineering

B.Tech (Electrical Engineering)

(2024-25)

ADAMAS UNIVERSITY
SCHOOL OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
B.Tech (Electrical Engineering)
Course Structure

FIRST YEAR

SEMESTER I								
S. No	**Type**	**Course Code**	**Course Title**	**L**	**T**	**P**	**Contact Hrs/wk**	**Credits**
1	Theory (BSC)	MTH11501	Engineering Mathematics-I	3	1	0	4	4
2	Theory (BSC)	EVS11112	Environmental Science	3	0	0	3	3
	Theory (BSC)	PHY13201	Applied Science	2	0	1	3	
3	Theory (ESC)	CSE11001	Introduction to Programming	2	0	0	2	2
		GEE11001	Electrical and Electronics Technology	2	0	0	2	
4	Theory (HSSM)	ENG11053	English Communication	1	0	2	3	2
	Theory	GEE11012	Disruptive Technology Innovations	1	0	2	3	
5	Theory (BSC)	BIT11003	Life Sciences	2	0	0	2	2
6	Theory	DGS11002	Design Thinking and Prototyping	3	0	0	3	3
	Theory (ESC)	MEE11002	Engineering Mechanics	2	1	0	3	
7								
8	Practical (ESC)	CSE12002	Programming Lab	0	0	4	4	2
		GEE12002	Electrical and Electronics Technology Lab	0	0	4	4	
9	Practical (ESC)	CEE12001	Engineering Drawing and CAD	0	0	4	4	2
		MEE12001	Engineering Workshop	0	0	4	4	
			Total	**14/12**	**1/2**	**10/11**	**25**	**20**

SEMESTER II								
S. No	**Type**	**Course Code**	**Course Title**	**L**	**T**	**P**	**Contact Hrs/wk**	**Credits**
1.	Theory (BSC)	MTH11502	Engineering Mathematics– II	3	1	0	4	4
2.	Theory (ESC)	MEE11002	Engineering Mechanics	2	1	0	3	3
	Theory	DGS11002	Design Thinking and Prototyping	3	0	0	3	
3.	Theory (BSC)	PHY13201	Applied Science	3	0	0	3	3
		EVS11112	Environmental Science	3	0	0	3	
4.	Theory (ESC)	GEE11001	Electrical and Electronics Technology	2	0	0	2	2
		CSE11001	Introduction to Programming	2	0	0	2	
5.	Theory	GEE11012	Disruptive Technology Innovations	1	0	2	3	2
	Theory (HSSM)	ENG11053	English Communication	1	0	2	3	
6.	Theory	EIC11001	Venture Ideation	2	0	0	2	2
7.	Practical (ESC)	GEE12002	Electrical and Electronics Technology Lab	0	0	4	4	2
		CSE12002	Programming Lab	0	0	4	4	
8	Practical (ESC)	MEE12001	Engineering Workshop	0	0	4	4	2
		CEE12001	Engineering Drawing and CAD	0	0	4	4	
			Total	**13/14**	**1/2**	**10/10**	**25**	**20**

Total Credits (First Year): 40

SECOND YEAR

SEMESTER III								
S. No	**Type**	**Course Code**	**Subject Name**	**L**	**T**	**P**	**Contact Hrs/wk**	**Credits**
1.	Theory (BSC)	MTH11535	Engineering Mathematics – III B	3	1	0	4	4
2.	Theory (ESC)	CSE11104	Data structure and Algorithm	3	0	0	3	3
3.	Theory (PCC)	EEE11003	Prof. Core – I Electrical Machines – I	3	1	0	4	4
4.	Theory (PCC)	EEE11002	Prof. Core – II Electrical and Electronics Measurement	3	0	0	3	3
5.	Theory (PCC)	EEE11061	Prof. Core – III Electrical circuit theory	3	0	0	3	3
6.	Theory (PCC)	CSE12107	Data Structure and Algorithm Lab	0	0	2	2	1
7.	Practical (PCC)	EEE12006	Prof. Core Lab – I Electrical Machines – I Lab	0	0	2	2	1
8.	Practical (PCC)	EEE12005	Prof. Core Lab – II Electrical and Electronic Measurement Lab	0	0	2	2	1
9.	Practical (BSC)	MTH12531	Numerical Techniques Lab	0	0	2	2	1
10.	Practical (P/S/I)	IDP14001	Interdisciplinary Project	0	0	5	5	3
11.	Practical	SOC14100	# Community Service	0	0	0	0	1
			Total	**15**	**2**	**13**	**30**	**25**

 # Community Service will be taken up during the summer vacation of II Semester and evaluated in III Semester.

SEMESTER IV								
S. No	**Type**	**Course Code**	**Subject Name**	**L**	**T**	**P**	**Contact Hrs/wk**	**Credits**
1.	Theory (PCC)	EEE11062	Prof. Core – IV Signals and Systems	3	1	0	4	4
2.	Theory (PCC)	EEE11007	Prof. Core – V Electrical Machines – II	3	1	0	4	4
3.	Theory (PCC)	EEE11046	Prof. Core – VI Power Systems	3	1	0	4	4
4.	Theory (PCC)	EEE11009	Prof. Core – VII Analog and Digital Electronics	3	1	0	4	4
5.	Theory	PSG11021	Human Values and Professional Ethics	2	0	0	2	2
6.	Practical (PCC)	EEE12063	Prof. Core Lab – III Electrical Circuits and Signals Lab	0	0	2	2	1
7.	Practical (PCC)	EEE12010	Prof. Core Lab – IV Electrical Machines II Lab	0	0	2	2	1
8.	Practical (PCC)	EEE12050	Prof. Core Lab – V Power Systems Lab	0	0	2	2	1
9.	Practical (PCC)	EEE12012	Prof. Core Lab – VI Analog and Digital Electronics Lab	0	0	2	2	1
			Total	**14**	**4**	**8**	**26**	**22**

Total Credits (Second Year): 47

THIRD YEAR

SEMESTER V								
S. No	**Type**	**Course Code**	**Subject Name**	**L**	**T**	**P**	**Contact Hrs /week**	**Credits**
1.	Theory (PCC)	ECE11015	Prof. Core –VIII Microcontrollers & Interfacing	3	1	0	4	4
2.	Theory (PCC)	EEE11015	Prof. Core – IX Power Electronics	3	1	0	4	4
3.	Theory (PCC)	EEE11064	Prof. Core – X Digital Signal Processing	3	1	0	4	4
4.	Theory (PCC)	EEE11014	Prof. Core – XI Control Systems	3	1	0	4	4
5.	Theory (PEC)	ECE11017/ EEE11016/ EEE11047	**Prof. Elective – I** 1. Foundation on Artificial Intelligence and Machine Learning 2. Special Electrical Machines 3. Energy Systems-I	3	0	0	3	3
6.	Theory (PEC)	ECE11020/ EEE11048/ EEE11049	**Prof. Elective – II** 1. Introduction to Machine Learning 2. Non-conventional Energy Resources 3. Sensors and Actuators	3	0	0	3	3
7.	Practical (PCC)	ECE12023	Prof. Core Lab – VII Microcontrollers & Interfacing Lab	0	0	2	2	1
8.	Practical (PCC)	EEE12022	Prof. Core Lab – VIII Power Electronics Lab	0	0	2	2	1
9.	Practical (PCC)	EEE12021	Prof. Core Lab – IX Control systems lab	0	0	2	2	1
10.	Seminar (P/S/I)	EEE15033	Technical Seminar	0	0	2	2	1
			Total	**18**	**4**	**8**	**30**	**26**

SEMESTER VI								
S. No	**Type**	**Course Code**	**Subject Name**	**L**	**T**	**P**	**Contact Hrs/wk**	**Credits**
1.	Theory (PCC)	EEE11034	Prof. Core – XII Electric Drives	3	1	0	4	4
2.	Theory (PCC)	EEE11024	Prof. Core – XIII Modern Control Systems	3	0	0	3	3
3.	Theory (PEC)	ECE11029/ EEE11051/ EEE11052	**Prof. Elective – III** 1. Introduction to Artificial Intelligence 2. Introduction to Electric Vehicles 3. Energy systems-II	3	0	0	3	3
4.	Theory (PEC)	ECE11032/ EEE11053/ EEE11054	**Prof. Elective – IV** 1. Advanced Machine Learning 2. Basic Modelling, Analysis and Control 3. Control of Energy Systems	3	0	0	3	3
5.	Theory (OEC)		**Open Elective – I**	3	0	0	3	3
6.	Theory (HSSM)	ECO11505	Economics for Engineers	3	0	0	3	3
7.	Practical (Sessional) (PCC)	EEE12038	Prof. Core Lab – X Electric Drives Lab	0	0	2	2	1
8.	Practical (PCC)	EEE12029	Prof. Core Lab – XI Modern Control Systems Lab	0	0	2	2	1
9.	Practical (PEC)	ECE12038/ EEE12055/ EEE12056	**Prof. Elective – I/II Lab** 1. Introduction to Machine Learning Lab 2. Machine Design Lab 3. Sensors and Actuators Lab	0	0	2	2	1
			Total	**18**	**1**	**6**	**25**	**22**

Total Credits (Third Year): 48

FOURTH YEAR

	SEMESTER VII							
S. No	**Type**	**Course CODE**	**Subject Name**	**L**	**T**	**P**	**Contact Hrs/week**	**Credits**
1.	Theory (HSSM)	MGT11402	Industrial Management	3	0	0	3	3
2.	Theory (PEC)	EEE11064/ EEE11057/ EEE11058	**Prof. Elective – V** 1. Application of AI in EE 2. Power Electronics and Drives for Automobiles 3. FACTS Controllers	3	0	0	3	3
3.	Theory (OEC)		**Open Elective – II**	3	0	0	3	3
4.	Theory (OEC)		**Open Elective – III**	3	0	0	3	3
5.	Practical (PEC)	ECE12044/ EEE12059/ EEE12060	**Prof. Elective III/IV/V Lab** 1. Introduction to Artificial Intelligence Lab 2. Simulation Lab 3. Controller design Lab	0	0	2	2	1
6.	Practical (P/S/I)	EEE14040	Summer Internship#	0	0	0	0	2
7.	Practical ((P/S/I)	EEE14039	Minor Project	0	0	2	6	3
			Total	**12**	**0**	**4**	**20**	**18**

 # Summer Internship for 30 days will be taken at the end of 6th semester and will be evaluated in the 7th semester.

SEMESTER VIII								
S. No	**Type**	**Course Code**	**Subject Name**	**L**	**T**	**P**	**Contact Hrs/week**	**Credits**
1.	Practical (P/S/I)	EEE14041	Industry Work Experience / SIRE* / Major Project	0	0	12	12 (For Major Project only)	6
2.	Practical (P/S/I)	EEE15042	Comprehensive Viva Voce	0	0	0	0	2
			Total	**0**	**0**	**12**	**12**	**8**

***SIRE: Scientific Investigation & Research Experience**

Total Credits (Forth Year): 26

Total Credits Distribution Semester wise: (B. Tech)

Semester	I	II	III	IV	V	VI	VII	VIII	Total Credits
Credits	20	20	25	22	26	22	18	08	161

S.No.	Category	Credit Breakup
1	Humanities and Social Sciences including Management courses (HSSM)	10
2	Basic Science courses (BSC)	22
3	Engineering Science courses including workshop, drawing, basics of electronics/electrical/mechanical/computer etc (ESC)	18
4	Professional core courses (PCC)	68
5	Professional Elective courses relevant to chosen specialization/branch (PEC)	17
6	Open subjects – Electives from other technical and /or emerging Subjects (OEC)	9
7	Project work, seminar and internship in industry or elsewhere (P/S/I)	17
8	Mandatory Courses [Environmental Sciences, Induction Program, Indian Constitution, Essence of Indian Knowledge Tradition]	(non-credit)
	Total	**161**