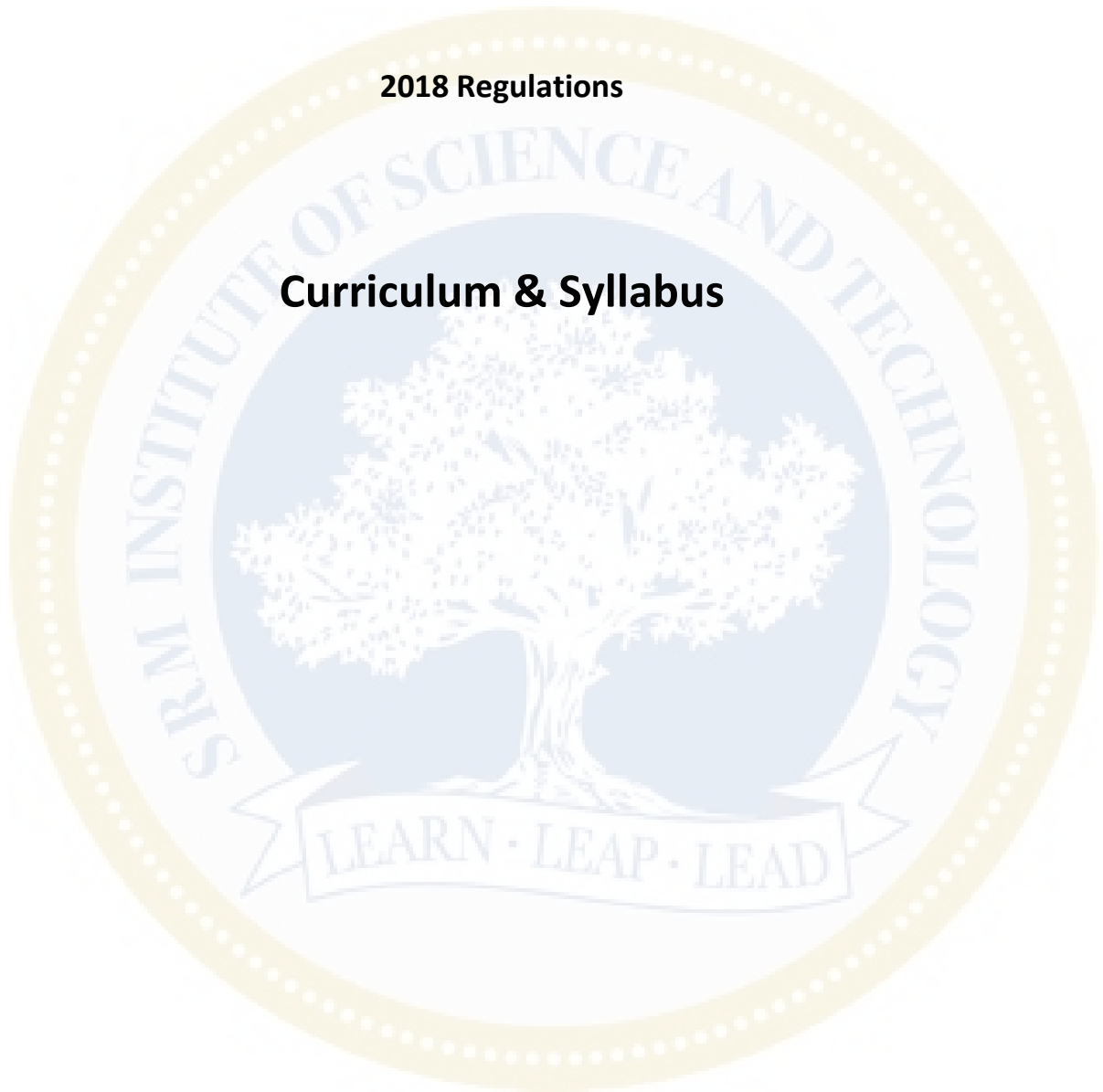# B. Tech in Electronics and Instrumentation Engineering

2018 Regulations

Curriculum & Syllabus

Department of Electronics and instrumentation Engineering

SRM Institute of Science and Technology

SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamilnadu

1. B. Tech in Electronics and Instrumentation Engineering

1. (a) Mission of the Department

Mission Stmt - 1	To have a scholarly and professional environment to make long lasting contributions for the advancement of knowledge.
Mission Stmt - 2	To foster research and development for the benefit of global community.
Mission Stmt - 3	To have an innovative, dynamic, flexible devising academic program and structure.

1. (b) Program Educational Objectives (PEO)

The Program Educational Objectives for the Electronics and Instrumentation Engineering program describe accomplishments that graduates are expected to attain within five years after graduation. Graduates within 5 years of graduation will / should demonstrate:

PEO – 1	Graduates will be able to take up career in optimization and automation of industrial process control with environment protection and safety concern.
PEO – 2	Graduates will be able to solve technical problems to serve the society in a responsible and ethical manner.
PEO – 3	Graduates will be able to serve the end users with cutting edge technologies to meet industry standards
PEO – 4	Graduates will be able to achieve broad and in depth knowledge of Instrumentation to practice and pursue higher studies
PEO – 5	Graduates will be able to work as a team on multidisciplinary projects and excel in their career
PEO – 6	Graduates will be adaptable to diverse working environment, possess good communication skills and leadership quality to solve Electronics and Instrumentation problems globally

1. (c) Mission of the Department to Program Educational Objectives (PEO) Mapping

	Mission Stmt. - 1	Mission Stmt. - 2	Mission Stmt. – 3
PEO - 1	3	2	3
PEO - 2	3	2	3
PEO - 3	2	3	2
PEO - 4	2	3	3
PEO - 5	2	3	3
PEO - 6	3	3	3

1. (d) Mapping Program Educational Objectives (PEO) to Program Outcomes (PO)

	Program Outcomes (PO)												Program Specific Outcomes (PSO)		
	Graduate Attributes (GA)														
	Engineering Knowledge	Problem Analysis	Design & Development	Analysis, Design, Research	Modern Tool Usage	Society & Culture	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning	Model a system and design a control methodology	Design, develop and implement Instrumentation System.	utilize the modern computational tools
PEO - 1	3	2	3		3	2	3	2	2	2	2	3	3	2	3
PEO - 2	3	3	2	3	2	3	-	3	2	2	-	-	2	2	3
PEO - 3	-	3	2	2	3	-	-	3	-	3	3	-	3	2	3
PEO - 4	3	-	3	2	-	-	-	2	-	2	-	3	2	3	2
PEO - 5	-	3	3	3	-	2	-	2	3	3	3	3	2	3	2
PEO - 6	-	3	-	-	-	2	3	2	3	3	3	-	2	3	2

Program Specific Outcomes (PSO)

Graduates of baccalaureate degree program in EIE must demonstrate knowledge and hands-on competence in the ability to:

PSO – 1	Model and perform analysis of any given system and to design a suitable control methodology based on the specifications for an enhanced process results.
PSO – 2	Apply the knowledge gained on transducers in any given field through the process of design, development, and implementation of instrumentation system.
PSO – 3	Design, Develop, Calibrate and test electronics engineering systems and utilize the modern computational tools to assess its effect on societal, health and environmental safety and consequent responsibilities relevant to engineering practices

1. (e) Program Structure (B.Tech in Electronics and Instrumentation Engineering)

1. Humanities & Social Sciences including Management Courses (H)

Course Code	Course Title	L	T	P	C
18LEH101J	English	2	0	2	3
18LEH102J	Chinese				
18LEH103J	French				
18LEH104J	German	2	0	2	3
18LEH105J	Japanese				
18LEH106J	Korean				
18PDH101L	General Aptitude	0	0	2	1
18PDH102T	Management Principles for Engineers	2	0	0	2
18PDH103T	Social Engineering	2	0	0	2
18PDH201L	Employability Skills & Practices	0	0	2	1
Total Learning Credits					**12**

2. Basic Science Courses (B)

Course Code	Course Title	L	T	P	C
18PYB101J	Physics: Electromagnetic Theory, Quantum Mechanics, Waves and Optics	3	1	2	5
18CYB101J	Chemistry	3	1	2	5
18MAB101T	Calculus and Linear Algebra	3	1	0	4
18MAB102T	Advanced Calculus and Complex Analysis	3	1	0	4
18MAB201T	Transforms and Boundary Value Problems	3	1	0	4
18MAB203T	Probability and Stochastic Processes	3	1	0	4
18MAB302T	Discrete Mathematics for Engineers	3	1	0	4
18BTB101T	Biology	2	0	0	2
Total Learning Credits					**32**

3. Engineering Science Courses (S)

Course Code	Course Title	L	T	P	C
18MES101L	Engineering Graphics and Design	1	0	4	3
18EES101J	Basic Electrical and Electronics Engineering	3	1	2	5
18MES103L	Civil and Mechanical Engineering Workshop	1	0	4	3
18CSS101J	Programming for Problem Solving	3	0	4	5
18EIC207J	Control Systems Design and Analysis	3	0	2	4
Total Learning Credits					**20**

4. Professional Core Courses (C)

Course Code	Course Title	L	T	P	C
18EIC201T	Electrical and Electronic Measurements and Instrumentation	3	0	0	3
18EIC202J	Digital Principles and System Design	3	0	2	4
18EIC203J	Instrument Transducers	2	0	2	3
18EIC204J	Electronics for Analog Signal Processing	3	0	2	4
18EIC205T	Signals, Systems and Communication	3	0	0	3
18EIC206J	Analog Integrated Circuits	3	0	2	4
18EIC301J	Embedded System Design	3	0	2	4
18EIC302T	Industrial Instrumentation	3	0	0	3
18EIC303J	Process control	3	0	2	4
18EIC304J	Industrial Process Automation Systems	3	0	4	5
18EIC305T	Power Electronics and Drives	3	0	0	3
18EIC306T	Discrete Time Signal Processing	3	0	0	3
18CSC308L	Competitive Professional Skills	0	0	2	1
18EIC350T	Comprehension	0	1	0	1
18EIC401J	Instrumentation System Design	3	0	2	4
18EIC402T	Industrial data Communication	3	0	0	3
Total Learning Credits					**52**

5. Professional Elective Courses (E)

Course Code	Course Title	L	T	P	C
	Professional Elective – 1	3	0	0	3
	Professional Elective – 2	3	0	0	3
	Professional Elective – 3	3	0	0	3
	Professional Elective – 4	3	0	0	3
	Professional Elective – 5	3	0	0	3
	Professional Elective – 6	3	0	0	3
Total Learning Credits					**18**

6. Open Elective Courses (O)

Course Code	Course Title	L	T	P	C
	Open Elective – 1	3	0	0	3
	Open Elective – 2	3	0	0	3
	Open Elective – 3	3	0	0	3
	Open Elective – 4	3	0	0	3
Total Learning Credits					**12**

7. Project Work, Seminar, Internship In Industry / Higher Technical Institutions (P)

Course Code	Course Title	L	T	P	C
18EIP101L/ 18EIP102L/ 18EIP103L	MOOC / Industrial Training / Seminar – 1	0	0	2	1
18EIP104L/ 18EIP105L/ 18EIP106L	MOOC / Industrial Training / Seminar – 2	0	0	2	1
18EIP107L / 18EIP108L	Minor Project / Internship (4-6 weeks)	0	0	6	3
18EIP109L / 18EIP110L	Project / Semester Internship	0	0	20	10
Total Learning Credits					**15**

8. Mandatory Courses (M)

Course Code	Course Title	L	T	P	C
18PDM101L	Professional Skills & Practices	0	0	2	0
18PDM201L	Competencies in Social Skills	0	0	2	0
18PDM202L	Critical & Creative Thinking Skills	0	0	2	0
18PDM301L	Analytical & Logical Thinking Skills	0	0	2	0
18LEM101T	Constitution of India	1	0	0	0
18LEM104J	Value Education	1	0	1	0
18GNM101L	Physical & Mental Health using Yoga	0	0	2	0
18GNM102L	NCC / NSS / NSO	0	0	2	0
18LEM109T	Indian Traditional Knowledge	1	0	0	0
18LEM110L	Indian Art Form	0	0	2	0
18CYM101T	Environmental Science	1	0	0	0
Total Learning Credits					**0**

List of Professional Elective Courses (E)
Any 6 Courses

Course Code	Course Title	L	T	P	C
18EIE201T	Reliability and Safety Engineering	3	0	0	3
18EIE202T	Renewable Energy	3	0	0	3
18EIE203T	Fundamental of MEMS	3	0	0	3
18EIE204J	Fundamentals of Data Structures and Algorithm	2	0	2	3
18EIE205T	Transducers for biomedical applications	3	0	0	3
18EIE301T	Building Automation System	3	0	0	3
18EIE302T	Electrical Energy Management and Conversion	3	0	0	3
18EIE303T	Automotive Sensors and Smart Systems	3	0	0	3
18EIE304T	Machine Learning Algorithms	3	0	0	3
18EIE305T	Biomedical Devices and Instrumentation	3	0	0	3
18EIE306T	Industrial Internet of Things	3	0	0	3
18EIE307T	Modern Control Techniques	3	0	0	3
18EIE308T	Fault Diagnosis and Tolerance System	3	0	0	3
18EIE309T	E-Vehicle Technology	3	0	0	3
18EIE310T	Intelligent Systems and Control	3	0	0	3
18EIE311T	State Space Control Design	3	0	0	3
18EIE312T	Industrial Processes and Control	3	0	0	3
18EIE313T	Deep Learning Techniques	3	0	0	3
18EIE314T	Biomedical Signal and Image Processing	3	0	0	3
18EIE401T	Cyber Security for Industrial Automation	3	0	0	3
18EIE402J	Electro-pneumatics and Hydraulics	2	0	2	3
18EIE403T	Multisensor and Decision Systems	3	0	0	3
18EIE404T	System on Chip	3	0	0	3
18EIE405T	Process Data Analytics	3	0	0	3
18EIE406T	System Identification	3	0	0	3
18EIE407T	Machine Vision Systems	3	0	0	3
18EIE408T	Non-linear Control system Design	3	0	0	3
18EIE409T	Bio-optical Instrumentation	3	0	0	3
18EIE410T	Bio-mechatronics	3	0	0	3

List of Open Elective Courses (O)
Any 4 Courses

Course Code	Course Title	L	T	P	C
18EIO131J	Virtual Instrumentation	2	0	2	3
18EIO132T	Analytical Instrumentation	3	0	0	3
18EIO133T	Industrial Automation Systems	3	0	0	3

1. (f) Program Articulation (B.Tech in Electronics and Instrumentation Engineering)

Course Code	Course Name	Engineering Knowledge	Problem Analysis	Design & Development	Analysis, Design, Research	Modern Tool Usage	Society & Culture	Environment & Sustainability	Ethics	Individual & Team Work	Communication	Project Mgt. & Finance	Life Long Learning	System Design & Analysis	Implementation of instrumentation system	Utilization of modern computational tools
		Program Outcomes (PO) — Graduate Attributes												PSO		
18EES101J	Basic Electrical and Electronics Engineering	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
18MES103L	Civil and Mechanical Engineering Workshop	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
18EIC207J	Control System Design and Analysis	3	-	-	2	-	-	-	-	-	-	-	-	3	-	-
18EIC201T	Electrical and Electronic Measurements and Instrumentation	1	1	1	1	1	1	-	-	-	-	-	-	-	-	1
18EIC202J	Digital Principles and System Design	2	2	2	-	-	-	-	-	-	-	-	-	2	-	-
18EIC203J	Instrument Transducers	2	2	-	-	-	-	-	-	-	-	-	-	2	3	-
18EIC204J	Electronics for Analog Signal Processing	2	1	-	-	-	-	-	-	-	-	-	-	1	-	-
18EIC205T	Signals, Systems and Communication	3	3	-	2	-	-	-	-	-	-	-	-	1	-	-
18EIC206J	Analog Integrated Circuits	2	2	-	-	-	-	-	-	-	-	-	-	2	-	-
18EIC301J	Embedded System Design	2	2	-	-	-	-	-	-	-	-	-	-	2	-	-
18EIC302T	Industrial Instrumentation	3	2	-	-	-	-	-	-	-	-	-	-	2	-	-
18EIC303J	Process control	2	-	2	2	-	-	-	-	-	-	-	-	-	2	-
18EIC304J	Industrial Process Automation Systems	2	1	1	-	-	-	-	-	-	-	-	-	3	3	-
18EIC305T	Power Electronics and Drives	2	2	-	-	-	-	-	-	-	-	-	-	2	-	-
18EIC306T	Discrete Time Signal Processing	3	3	2	-	-	-	-	-	-	-	-	-	3	-	-
18EIC401J	Instrumentation System Design	2	2	-	-	-	-	-	-	-	-	-	-	2	-	-
18EIC402T	Industrial data Communication	1	-	2	-	-	-	-	-	-	3	-	-	-	-	-
18EIC350T	Comprehension	3	-	2	-	-	-	-	-	-	-	-	-	3	-	-
18EIP101L/ 18EIP102L/ 18EIP103L	MOOC / Industrial Training / Seminar – 1	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
18EIP104L/ 18EIP105L/ 18EIP106L	MOOC / Industrial Training / Seminar – 2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
18EIP107L / 18EIP108L	Minor Project / Internship (4-6 weeks)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
18EIP109L / 18EIP110L	Project / Semester Internship	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

PSO – Program Specific Outcomes (PSO)

1. (g) Implementation Plan (B. Tech in Electronics and Instrumentation Engineering)

Semester - I					
Code	Course Title	L	T	P	C
18LEH102J-18LEH106J	Foreign Language (Chinese/ French/ German/ Japanese / Korean)	2	0	2	3
18MAB101T	Calculus and Linear Algebra	3	1	0	4
18CYB101J	Chemistry	3	1	2	5
18CSS101J	Programming for Problem Solving	3	0	4	5
18MES103L	Civil and Mechanical Engineering Workshop	1	0	4	3
18PDM101L	Professional Skills and Practices	0	0	2	0
18LEM102J	Value Education	1	0	1	0
18GNM102L	NCC / NSS / NSO	0	0	2	0
Total Learning Credits					20

Semester – II					
Code	Course Title	L	T	P	C
18LEH101J	English	2	0	2	3
18MAB102T	Advanced Calculus and Complex Analysis	3	1	0	4
18PYB101J	Physics: Electromagnetic Theory, Quantum Mechanics, Waves and Optics	3	1	2	5
18MES101L	Engineering Graphics and Design	1	0	4	3
18EES101J	Basic Electrical and Electronics Engineering	3	1	2	5
18PDH101L	General Aptitude	0	0	2	1
18LEM101T	Constitution of India	1	0	0	0
18GNM101L	Physical and Mental Health using Yoga	0	0	2	0
Total Learning Credits					21

Semester - III					
Code	Course Title	L	T	P	C
18MAB201T	Transforms and Boundary Value Problems	3	1	0	4
18EIC201T	Electrical and Electronic Measurements and Instrumentation	3	0	0	3
18EIC202J	Digital Principles and System Design	3	0	2	4
18EIC203J	Instrument Transducers	2	0	2	3
18EIC204J	Electronics for Analog Signal Processing	3	0	2	4
18EIC205T	Signals, Systems and Communication	3	0	0	3
18PDH103T	Social Engineering	2	0	0	2
18PDM201L	Competencies in Social Skills	0	0	2	0
18CYM101T	Environmental Science	1	0	0	0
Total Learning Credits					23

Semester - IV					
Code	Course Title	L	T	P	C
18MAB203T	Probability and Stochastic Processes	3	1	0	4
18BTB101T	Biology	2	0	0	2
18EIC206J	Analog Integrated Circuits	3	0	2	4
18EIC207J	Control Systems Design and Analysis	3	0	2	4
	Professional Elective-1	3	0	0	3
	Open Elective-1	3	0	0	3
18PDH102T	Management Principles for Engineers	2	0	0	2
18PDM202L	Critical and Creative Thinking Skills	0	0	2	0
Total Learning Credits					22

Semester - V					
Code	Course Title	L	T	P	C
18MAB302T	Discrete Mathematics for Engineers	3	1	0	4
18EIC301J	Embedded System Design	3	0	2	4
18EIC302T	Industrial Instrumentation	3	0	0	3
18EIC303J	Process control	3	0	2	4
	Professional Elective – 2	3	0	0	3
	Open Elective – 2	3	0	0	3
18EIP101L/ 18EIP102L/ 18EIP103L	Massive Open Online Course-I / Industrial Training-I / Seminar-I	0	0	2	1
18PDM301L	Analytical and Logical Thinking Skills	0	0	2	0
18LEM110L	Indian Art Form	0	0	2	0
Total Learning Credits					22

Semester - VI					
Code	Course Title	L	T	P	C
18EIC304J	Industrial Process Automation Systems	3	0	4	5
18EIC305T	Power Electronics and Drives	3	0	0	3
18EIC306T	Discrete Time Signal Processing	3	0	0	3
18EIC350T	Comprehension	0	1	0	1
	Professional Elective-3	3	0	0	3
	Professional Elective-4	3	0	0	3
	Open Elective-3	3	0	0	3
18EIP104L/ 18EIP105L/ 18EIP106L	Massive Open Online Course-II / Industrial Training-II / Seminar-II	0	0	2	1
18PDH201L	Employability Skills and Practices	0	0	2	1
18LEM109T	Indian Traditional Knowledge	1	0	0	0
18CSC308L	Competitive Professional Skills	0	0	2	1
Total Learning Credits					24

Semester - VII					
Code	Course Title	L	T	P	C
18EIC401J	Instrumentation System Design	3	0	2	4
18EIC402T	Industrial data Communication	3	0	0	3
	Professional Elective-5	3	0	0	3
	Professional Elective-6	3	0	0	3
	Open Elective-4	3	0	0	3
18EIP107L / 18EIP108L	Minor Project / Internship (4-6 weeks)	0	0	6	3
Total Learning Credits					19

Semester - VIII					
Code	Course Title	L	T	P	C
18EIP109L / 18EIP110L	Project / Semester Internship	0	0	20	10
Total Learning Credits					10

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Engineering Science Courses (S)					
Course Code	**Course Title**	**Hours/ Week**			**C**
		L	**T**	**P**	
18EIC207J	Control System Design and Analysis	3	0	2	4
	Total Learning Credits				**4**

Professional Core Courses (C)					
Course Code	**Course Title**	**Hours/ Week**			**C**
		L	**T**	**P**	
18EIC201T	Electrical and Electronic Measurements and Instrumentation	3	0	0	3
18EIC202J	Digital Principles and System Design	3	0	2	4
18EIC203J	Instrument Transducers	2	0	2	3
18EIC204J	Electronics for Analog Signal Processing	3	0	2	4
18EIC205T	Signals, Systems and Communication	3	0	0	3
18EIC206J	Analog Integrated Circuits	3	0	2	4
18EIC301J	Embedded System Design	3	0	2	4
18EIC302T	Industrial Instrumentation	3	0	0	3
18EIC303J	Process control	3	0	2	4
18EIC304J	Industrial Process Automation Systems	3	0	4	5
18EIC305T	Power Electronics and Drives	3	0	0	3
18EIC306T	Discrete Time Signal Processing	3	0	0	3
18EIC350T	Comprehension	0	1	0	1
18EIC401J	Instrumentation System Design	3	0	2	4
18EIC402T	Industrial data Communication	3	0	0	3
	Total Learning Credits				**51**

List of Professional Elective Courses (E) *Any 6 Courses*				
Course Code	**Course Title**	**Hours/ Week**		
		L	**T**	**P**	**C**
18EIE201T	Reliability and Safety Engineering	3	0	0	3
18EIE202T	Renewable Energy	3	0	0	3
18EIE203T	Fundamental of MEMS	3	0	0	3
18EIE204J	Fundamentals of Data Structures and Algorithm	2	0	2	3
18EIE205T	Transducers for Biomedical applications	3	0	0	3
18EIE301T	Building Automation System	3	0	0	3
18EIE302T	Electrical Energy Management and Conversion	3	0	0	3
18EIE303T	Automotive Sensors and Smart Systems	3	0	0	3
18EIE304T	Machine Learning	3	0	0	3
18EIE305T	Biomedical Devices and Instrumentation	3	0	0	3
18EIE306T	Industrial Internet of Things	3	0	0	3
18EIE307T	Modern Control Techniques	3	0	0	3
18EIE308T	Fault Diagnosis and Tolerance System	3	0	0	3
18EIE309T	E-Vehicle Systems	3	0	0	3
18EIE310T	Intelligent Systems and Control	3	0	0	3
18EIE311T	State Space Control Design	3	0	0	3
18EIE312T	Industrial Processes and Control	3	0	0	3
18EIE313T	Deep Learning	3	0	0	3
18EIE314T	Biomedical Signal and Image Processing	3	0	0	3
18EIE401T	Cyber Security for Industrial Automation	3	0	0	3
18EIE402J	Electro-pneumatics and Hydraulics	2	0	2	3
18EIE403T	Multisensor and Decision Systems	3	0	0	3
18EIE404T	System on Chip	3	0	0	3
18EIE405T	Process Data Analytics	3	0	0	3
18EIE406T	System Identification	3	0	0	3
18EIE407T	Machine Vision Systems	3	0	0	3
18EIE408T	Non-linear Control Design	3	0	0	3
18EIE409T	Bio-optical Instrumentation	3	0	0	3
18EIE410T	Bio-mechatronics	3	0	0	3

List of Open Elective Courses (O)					
Any 4 Courses					
Course Code	Course Title	Hours/ Week			
		L	T	P	C
18EIO131J	Virtual Instrumentation	2	0	2	3
18EIO132T	Analytical Instrumentation	3	0	0	3
18EIO133T	Industrial Automation Systems	3	0	0	3
18EIO136J	PLC for Industrial Automation	2	0	2	3