

13. Courses of Study and Scheme of Assessment

BE INSTRUMENTATION AND CONTROL ENGINEERING

(2019 Regulations)
(Minimum credits to be earned: 165)

Course Code	Course Title	Periods / week			Maximum Marks				
		Lecture	Tutorial	Practical	Credits	CA	FE	Total	CAT
SEMESTER 1									
19U101	Calculus and its Applications	3	1	0	4	50	50	100	BS
19U102	Introduction to Electromagnetic Theory	3	0	0	3	50	50	100	BS
19U103	Chemistry of Electronic Materials	3	0	0	3	50	50	100	BS
19U104	Problem Solving and C Programming	2	0	0	2	50	50	100	ES
19G105	English Language Proficiency	2	1	0	3	50	50	100	HS
19U106	Electric Circuits	3	1	0	4	50	50	100	ES
19U110	Engineering Graphics	0	0	4	2	50	50	100	ES
19U111	Problem Solving and C Programming Laboratory	0	0	2	1	50	50	100	ES
19IP15	Induction Programme **	0	0	0	0	-	-	-	MC
Total 25 periods		16	3	6	22	400	400	800	
SEMESTER 2									
19U201	Complex Variables and Transforms	3	1	0	4	50	50	100	BS
19U202	Materials Science	2	0	0	2	50	50	100	BS
19U203	Industrial Electrochemistry	2	0	0	2	50	50	100	BS
19U204	Electronic Devices and Circuits	3	0	0	3	50	50	100	ES
19_____	Language Elective	0	0	4	2	50	50	100	HS
19U210	Circuits and Devices Laboratory	0	0	4	2	50	50	100	ES
19U211	Basic Sciences Laboratory	0	0	4	2	50	50	100	BS
19U212	Computational Techniques	0	0	2	1	50	50	100	ES
19U215	Activity Point Programme*	-	-	-	Grade	-	-	-	MC
Semester 2- Summer Term									
19U213	Internship [€]	0	0	0	2 [€]	100	0	100	EEC
Total 25 periods		10	1	14	20	500	400	900	

** As per norms

* As per AICTE Norms; Total 60 hrs; Grade: Completed / Not completed; Not counted for CGPA

CA Continuous Assessment

FE Final Examination

€ This course will be conducted prior to the commencement of the third semester for a period of 3 weeks

£ For internship, one credit is equivalent to minimum 40 hours of work as per norms

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Course Code	Course Title	Periods / week			Maximum Marks				
		Lecture	Tutorial	Practical	Credits	CA	FE	Total	CAT
SEMESTER 3									
19U301	Linear Algebra and Numerical Analysis	3	1	0	4	50	50	100	BS
19U302	Electrical Machines	3	0	0	3	50	50	100	ES
19U303	Digital Electronics	3	1	0	4	50	50	100	PC
19U304	Linear ICs and Applications	3	0	0	3	50	50	100	PC
19U305	Thermodynamics and Fluid Mechanics	3	0	0	3	50	50	100	ES
19O306	Economics for Engineers	3	0	0	3	50	50	100	HS
19U310	Electrical Machines Laboratory	0	0	4	2	50	50	100	ES
19U311	Linear and Digital ICs Laboratory	0	0	4	2	50	50	100	PC
19K312	Environmental Science **	2	0	0	0	-	-	-	MC
19U315	Activity Point Programme *	-	-	-	Grade	-	-	-	MC
Total 30 periods		20	2	8	24	400	400	800	
SEMESTER 4									
19U401	Probability and Random Processes	3	1	0	4	50	50	100	BS
19U402	Transducer Engineering	3	0	0	3	50	50	100	PC
19U403	Electrical and Electronic Measurements	3	0	0	3	50	50	100	PC
19U404	Control Systems I	3	1	0	4	50	50	100	PC
19U405	Principles of Communication Systems	2	0	0	2	50	50	100	ES
19U406	Data Structures and Algorithms	3	0	0	3	50	50	100	ES
19U410	Transducer Laboratory	0	0	4	2	50	50	100	PC
19U411	Systems and Measurement Laboratory	0	0	4	2	50	50	100	PC
19O412	Indian Constitution **	2	0	0	0	-	-	-	MC
19Q413	Soft Skills Development	0	0	2	1	100	0	100	EEC
19U415	Activity Point Programme *	-	-	-	Grade	-	-	-	MC
Total 31 periods		19	2	10	24	500	400	900	

** As per norms

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Course Code	Course Title	Periods / week			Maximum Marks				
		Lecture	Tutorial	Practical	Credits	CA	FE	Total	CAT
SEMESTER 5									
19U501	Industrial Instrumentation I	3	0	0	3	50	50	100	PC
19U502	Control Systems II	3	1	0	4	50	50	100	PC
19U503	Microprocessors and Microcontrollers	3	0	0	3	50	50	100	PC
19U504	Digital Signal Processing	3	0	0	3	50	50	100	PC
19U505	Computer Networks	3	0	0	3	50	50	100	PC
19U___	Professional Elective I	3	0	0	3	50	50	100	PE
19U510	Control Systems Laboratory	0	0	2	1	50	50	100	PC
19U511	Microprocessor and DSP Laboratory	0	0	2	1	50	50	100	PC
19Q513	Business and Managerial Communications	0	0	2	1	100	0	100	EEC
19U515	Activity Point Programme *	-	-	-	Grade	-	-	-	MC
Total 25 periods		18	1	6	22	500	400	900	
SEMESTER 6									
19U601	Industrial Instrumentation II	3	0	0	3	50	50	100	PC
19U602	Process Control	3	1	0	4	50	50	100	PC
19U603	Embedded System Design	3	0	0	3	50	50	100	EEC
19U604	Power Electronics and Drives	3	0	0	3	50	50	100	PC
19U___	Professional Elective II	3	0	0	3	50	50	100	PE
19U___	Professional Elective III	3	0	0	3	50	50	100	PE
19U610	Process Control Laboratory	0	0	2	1	50	50	100	PC
19U611	Embedded System Laboratory	0	0	2	1	50	50	100	EEC
19Q613	Quantitative and Reasoning Skills	0	0	2	1	100	0	100	EEC
19U620	Innovation Practices	0	0	4	2	100	0	100	EEC
19U615	Activity Point Programme *	-	-	-	Grade	-	-	-	MC
Total 29 periods		18	1	10	24	600	400	1000	

At the end of 6th semester, the students are required to earn the minimum number of activity points from the AICTE mandated ACTIVITY POINT PROGRAMME to qualify for the award of BE/BTech degree (Refer Section 4 (vii) (c) of 2019 Regulations)

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Course Code	Course Title	Periods / week			Maximum Marks					
		Lecture	Tutorial	Practical	Credits	CA	FE	Total	CAT	
SEMESTER 7										
19U701	Logic and Distributed Control System	3	0	0	3	50	50	100	PC	
19U702	Analytical Instrumentation	3	0	0	3	50	50	100	PC	
19U___	Professional Elective IV	3	0	0	3	50	50	100	PE	
19U___	Professional Elective V	3	0	0	3	50	50	100	PE	
19___	Open Elective I	3	0	0	3	50	50	100	OE	
19U710	Industrial Automation Laboratory	0	0	2	1	50	50	100	PC	
19U711	Industrial and Virtual Instrumentation Laboratory	0	0	2	1	50	50	100	PC	
19U720	Project Work I	0	0	4	2	100	0	100	EEC	
Total 23 periods		15	0	8	19	450	350	800		
SEMESTER 8										
19U___	Professional Elective VI	3	0	0	3	50	50	100	PE	
19___	Open Elective II	3	0	0	3	50	50	100	OE	
19U820	Project Work II	0	0	8	4	100	0	100	EEC	
Total 14 periods		6	0	8	10	200	100	300		

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PROFESSIONAL ELECTIVES

- 19U001 Biomedical Instrumentation
- 19U002 Fiber Optics and Laser Instrumentation
- 19U003 Instrumentation System Design
- 19U004 Power Plant Instrumentation
- 19U005 Instrumentation and Control in Petro Chemical Industries
- 19U006 Optimal and Adaptive Control Systems
- 19U007 System Identification
- 19U008 Industrial Chemical Processes
- 19U009 Applied Soft Computing
- 19U010 VLSI Design
- 19U011 Operating Systems
- 19U012 Robotics and Automation
- 19U013 Product Design and Development
- 19U014 Measurement Data Analytics
- 19U015 Advanced Digital Signal Processing
- 19U016 Digital Image Processing
- 19U017 Computer Architecture
- 19U018 Non Linear Systems Theory
- 19U019 Fundamentals of Pneumatics and Hydraulics
- 19U020 Safety Instrumented Systems
- 19U021 Smart Sensors and Actuators
- 19U022 Industrial Internet of Things
- 19U023 Non-Conventional Energy Systems

ONE-CREDIT COURSES

INSTRUMENTATION AND CONTROL SYSTEMS ENGINEERING

- 19UF01 Distributed Control System in Industries
- 19UF02 Advanced Industrial Automation Systems
- 19UF03 Marine Instrumentation and Systems
- 19UF04 Medical Image Analysis
- 19UF05 System Design and Implementation
- 19UF06 Calibration Techniques
- 19UF07 Motion Control Systems
- 19UF08 Electrical Metrology
- 19UF09 Standard Practices for Power Plant Instrumentation
- 19UF10 Automotive Instrumentation and Control
- 19UF11 Aircraft Instrumentation
- 19UF12 Automatic Flight Control System

ENGLISH

- 19GF01 Interpersonal and Organizational Communication
- 19GF02 Human Values Through Literature

HUMANITIES

- 19OFA1 Export – Import Practices
- 19OFA2 Insurance - Concepts and Practices
- 19OFA3 Public Finance
- 19OFA4 Public Finance and Taxation
- 19OFA5 Social Entrepreneurship

LANGUAGE ELECTIVES

- 19G001 Communication Skills for Engineers
- 19G002 German- Level A1.1
- 19G003 French Language Level 1
- 19G004 Basic Japanese

Summary of Credit Distribution

BE INSTRUMENTATION AND CONTROL ENGINEERING										
S. No	Course Category	Credits Per Semester								Total Credits
		1	2	3	4	5	6	7	8	
1	HS	3	2	3	0	0	0	0	0	8
2	BS	10	10	4	4	0	0	0	0	28
3	ES	9	6	8	5	0	0	0	0	28
4	PC	0	0	9	14	18	11	8	0	60
5	PE	0	0	0	0	3	6	6	3	18
6	OE	0	0	0	0	0	0	3	3	6
7	EEC	0	0+2	0	1	1	7	2	4	17
8	MC	-	-	-	-	-	-	-	-	-
	TOTAL	22	18+2	24	24	22	24	19	10	165

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