



1.3 Curriculum Enrichment

1.3.2. Average percentage of courses that include experiential learning through project work/field work/internship during last five years

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VISWAJYOTHI COLLEGE OF ENGINEERING & TECHNOLOGY

(Approved by AICTE, Affiliated to APJ Abdul Kalam Technological University, Kerala)

Vazhakulam P.O., Muvattupuzha, Ernakulam Dist., Kerala, India - 686 670

Ph: 0485 2262211, 2262244, 2262255, 2262977, Fax : 0485 2262211

Web : www.vjcet.ac.in E-mail : vjcet@vjcet.org, vjcvklm@gmail.com



All B.Tech Programmes (CE, CSE, ECE, EEE, IT & ME) Accredited by NBA

Date : 28/04/2021

Self Declaration

Subject: Reference to metric number 1.3.2. Experiential learning courses in the curriculum apart from Project work/ Internship/ field work

In Civil Engineering, for undergraduate programme, semesters from 1 to 6 consists of 8 courses out of which 2 are laboratory courses and semester 7 consists of 1 laboratory course as per APJ Abdul Kalam Technological University in addition to project work/Internships/Field work. In MG university, for undergraduate programme, semesters from 1 to 7 consists of 8 courses out of which 2 are laboratory courses and semester 8 consists of 1 laboratory course. In laboratory courses, students undergo experiential learning related to one or more theory courses. Thus each student goes through more than 30% of experiential learning in each semester.




Dr. K.K. Rajan
Principal

Viswajyothi College of Engineering & Technology
Vazhakulam P.O., Muvattupuzha, Kerala-686 670

Note: Sample copy of scheme and syllabus is enclosed along with this letter.

**Mahatma Gandhi University Revised Scheme For
B Tech Syllabus Revision 2010 (Civil Engineering)**

**Common for All Branches
SCHEME S1&S2**

Code	Subject	Hours/week			Marks		End-sem duration- hours	Credits
		L	T	P/D	Inter- nal	End- sem		
EN010 101	Engineering Mathematics I	2	1	-	50	100	3	5
EN010 102	Engineering Physics	1	1	-	50	100	3	4
EN010 103	Engineering. Chemistry & Environmental Studies	1	1	-	50	100	3	4
EN010 104	Engineering Mechanics	3	1	-	50	100	3	6
EN010 105	Engineering Graphics	1	3	-	50	100	3	6
EN010 106	Basic Civil Engineering	1	1	-	50	100	3	4
EN010 107	Basic Mechanical Engineering	1	1	-	50	100	3	4
EN010 108	Basic Electrical Engineering	1	1	-	50	100	3	4
EN010 109	Basic Electronics Engineering. & Information Technology	2	1	-	50	100	3	5
EN010 110	Mechanical Workshop	-	-	3	50	-	3	1
EN110 111	Electrical and Civil Workshops	-	-	3	100	-	3	1
	Total	13	11	6			30	44

3rd Semester

Code	Subject	Hours/week			Marks		End- sem duration	Credits
		L	T	P/D	Inter- nal	End- sem		
EN010 301	Engineering Mathematics II	2	2	-	50	100	3	4
EN010 302	Economics and Communication Skills	2	2	-	50	100	3	4 (3+1)
CE010 303	Fluid Mechanics	2	2	-	50	100	3	4
CE010 304	Mechanics of Solids I	3	1	-	50	100	3	4
CE010 305	Surveying I	3	1	-	50	100	3	4
CE010 306	Engineering Geology	3	1		50	100	3	4
CE010 307	Material Testing Lab I	-	-	3	50	100	3	2
CE010 308	Surveying Practical I	-	-	3	50	100	3	2
	Total	15	9	6				28

4th Semester

Code	Subject	Hours/week			Marks		End-sem duration- hours	Credits
		L	T	P/D	Internal	End-sem		
EN010 401	Engineering Mathematics III	2	2	-	50	100	3	4
CE010 402	Construction Engineering and Management	3	1	-	50	100	3	4
CE010 403	Mechanics of Solids II	2	2	-	50	100	3	4
CE010 404	Open Channel Flow and Hydraulic Machines	3	1	-	50	100	3	4
CE010 405	Surveying II	3	1	-	50	100	3	4
CE010 406	Civil Engineering Drawing			4	50	100	3	4
CE010 407	<i>Surveying Practical II</i>	-	-	3	50	100	3	2
CE010 408(ME)	<i>Hydraulics Lab</i>	-	-	3	50	100	3	2
	Total	16	8	6				28

5th Semester

Code	Subject	Hours/week			Marks		End-sem duration- hours	Credits
		L	T	P/D	Internal	End-sem		
EN010 501A	Engineering Mathematics IV	2	2	-	50	100	3	4
CE010 502	Computer Programming	3	1		50	100	3	4
CE010 503	Design of Concrete Structures I	2	2	-	50	100	3	4
CE010 504	Geotechnical Engineering I	3	1	-	50	100	3	4
CE010 505	Quantity Surveying and Valuation	3	1	-	50	100	3	4
CE010 506	Structural Analysis I	3	1	-	50	100	3	4
CE010 507	<i>Computing Techniques Lab</i>	-	-	3	50	100	3	2
CE010 508	<i>Geotechnical Engineering Lab</i>	-	-	3	50	100	3	2
	Total	16	8	6				28

6th Semester

Code	Subject	Hours/week			Marks		End-sem duration -hours	Credits
		L	T	P/D	Internal	End-sem		
CE010 601	Design of Steel Structures	2	2	-	50	100	3	4
CE010 602	Geotechnical Engineering II	2	2	-	50	100	3	4
CE010 603	Structural Analysis II	3	1	-	50	100	3	4
CE010 604	Transportation Engineering I	3	1	-	50	100	3	4
CE010 605	Water Resources Engineering	3	1	-	50	100	3	4
CE010 606Lxx	Elective I	2	2	-	50	100	3	4
CE010 607	Computer Aided Design and Drafting Lab	-	-	3	50	100	3	2
CE010 608	Material Testing Lab II	-	-	3	50	100	3	2
	Total	15	9	6				28

Elective I

- CE010 606L01 Advanced Surveying
- CE010 606L02 Open Channel and Coastal Hydraulics
- CE010 606L03 Airport Engineering
- CE010 606L04 Advanced Mechanics of Materials
- CE010 606L05 Concrete Technology
- CE010 606L06 Soil Stability Analysis.

7th Semester

Code	Subject	Hours/week			Marks		End-sem duration-hours	Credits
		L	T	P/D	Internal	End-sem		
CE010 701	Design of Hydraulic Structures	2	2	-	50	100	3	4
CE010 702	Environmental Engineering I	2	2	-	50	100	3	4
CE010 703	Design of Concrete Structures II	2	1	-	50	100	3	3
CE010 704	Architecture and Town Planning	2	1	-	50	100	3	3
CE010 705	Transportation Engineering II	2	1	-	50	100	3	3
CE010 706Lxx	Elective II	2	2	-	50	100	3	4
CE010 707	Computer Applications Lab	-	-	3	50	100	3	2
CE010 708	Transportation Engineering Lab	-	-	3	50	100	3	2
CE010 709	Seminar	-	-	2	50	-	-	2
CE010 710	Project	-	-	1	50	-	-	1
	Total	12	9	9				28

Elective II

- CE010 706L01 Building Automation and Smart Structures
- CE 010 706L02 Ground Improvement Techniques
- CE 010 706L03. Prestressed Concrete.
- CE 010 706L04 Environmental Impact Assessment
- CE 010 706L05 Theory of Plates and Shells
- CE 010 706L06 Traffic Engineering and Management

8th Semester

Code	Subject	Hours/week			Marks		End-sem duration -hours	Credits
		L	T	P/D	Inte-rnal	End-sem		
CE010 801	Advanced Structural Design	3	2	-	50	100	3	4
CE010 802	Building Technology and Management	2	2	-	50	100	3	4
CE010 803	Environmental Engineering II	2	2	-	50	100	3	4
CE010 804Lxx	Elective III	2	2	-	50	100	3	4
CE010 805Gxx	Elective IV	2	2	-	50	100	3	4
CE010 806	Environmental Engineering Lab	-	-	3	50	100	3	2
CE010 807	Project	-	-	6	100	-	-	4
CE010 808	Viva Voce	-	-	-	-	50	-	2
	Total	11	10	9				28

Electives III

- CE010 804L01 Advanced Foundation Design
- CE010 804L02 Environmental Geotechniques
- CE010 804L03 Earthquake Engineering and Design
- CE010 804L04 Advanced Hydrology and System Analysis
- CE010 804L05 Highway and Airfield Pavements
- CE010 804L06 Structural Dynamics and Stability Analysis

Electives IV

- CE010 805G01 Finite Element Analysis
- CE010 805G02 Environmental Pollution Control Techniques
- CE010 805G03 Optimization Techniques
- CE010 805G04 Land Use Planning
- CE010 805G05 Numerical Methods
- CE010 805G06 Remote Sensing and GIS Applications



KERALA TECHNOLOGICAL UNIVERSITY

Curriculum for Semesters I and II

2015

Kerala Technological University
CET Campus, Thiruvananthapuram
Kerala -695016 India
Phone +91 471 2598122, 2598422
Fax +91 471 2598522
Web: ktu.edu.in
Email: university@ktu.edu.in

SEMESTER I

Slot	Course No.	Subject	L-T-P	Hours	Credits
A	MA101	Calculus	3-1-0	4	4
B (1/2)	PH100	Engineering Physics	3-1-0	4	4
	CY100	Engineering Chemistry	3-1-0	4	4
C (1/2)	BE100	Engineering Mechanics	3-1-0	4	4
	BE110	Engineering Graphics	1-1-2	4	3
D	BE101-0X	Introduction to _____ Engineering	2-1-0	3	3
E	BE103	Introduction to Sustainable Engineering	2-0-1	3	3
F (1/4)	CE100	Basics of Civil Engineering	2-1-0	3	3
	ME100	Basics of Mechanical Engineering	2-1-0	3	3
	EE100	Basics of Electrical Engineering	2-1-0	3	3
	EC100	Basics of Electronics Engineering	2-1-0	3	3
S (1/2)	PH110	Engineering Physics Lab	0-0-2	2	1
	CY110	Engineering Chemistry Lab	0-0-2	2	1
T (2/4)	CE110/ME110/ EE110/EC110/ CS110/CH110	Basic Engineering Workshops (CS110 for CS and related branches and CH110 for CH and related branches only)	0-0-2 + 0-0-2	2 2	1 1
U		U100 Language lab/ Bridge courses/ Remedial programmes/Micro Projects etc	0-0-3	3	
				30	24/23
V		V100 Entrepreneurship/TBI/NCC/NSS/ Physical Edn. etc	0-0-2	2	Activity points

SEMESTER II

Slot	Course No.	Subject	L-T-P	Hours	Credits
A	MA102	Differential Equations	3-1-0	4	4
B (1/2)	PH100	Engineering Physics	3-1-0	4	4
	CY100	Engineering Chemistry	3-1-0	4	4
C (1/2)	BE100	Engineering Mechanics	3-1-0	4	4
	BE110	Engineering Graphics	1-1-2	4	3
D	BE102	Design & Engineering	2-0-2	4	3
E, F (2/4)	CE 100	Basics of Civil Engineering	2-1-0	3	3
	ME 100	Basics of Mechanical Engineering	2-1-0	3	3
	EE 100	Basics of Electrical Engineering	2-1-0	3	3
	EC 100	Basics of Electronics Engineering	2-1-0	3	3
S (1/2)	PH110	Engineering Physics Lab	0-0-2	2	1
	CY110	Engineering Chemistry Lab	0-0-2	2	1
T (2/4)	CE110/ME110/ EE110/EC110	Basic Engineering Workshops	0-0-2 + 0-0-2	2 2	1 1
U		U100 Language lab / Bridge courses/ Remedial programmes/Micro Projects etc	0-0-2	2	
				30	24/23
V		V100 Entrepreneurship /TBI/NCC/NSS/ Physical Edn. etc	0-0-2	2	Activity points

Note: 1. Institutions can assign **two of four** Basics of Engineering courses not already taken by the student in the previous semester and the corresponding Workshop courses in Semester 2.



APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

**Curriculum
for
B.Tech Degree
Semesters III to VIII
2016**

Civil Engineering

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

CET CAMPUS, THIRUVANANTHAPURAM – 695016

KERALA, INDIA

Phone +91 471 2598122, 2598422

Fax +91 471 2598522 Web: ktu.edu.in

Email: university@ktu.edu.in

BRANCH: *Civil Engineering*

SEMESTER - 3

Course Code	Course Name	L-T-P	Credits	Exam Slot
MA201	Linear Algebra & Complex Analysis	3-1-0	4	A
CE201	Mechanics of Solids	3-1-0	4	B
CE203	Fluid Mechanics– I	3-1-0	4	C
CE205	Engineering Geology	3-0-1	4	D
CE207	Surveying	3-0-0	3	E
HS200/ HS210	Business Economics/Life Skills	3-0-0/ 2-0-2	3	F
CE231	Civil Engineering Drafting Lab	0-0-3	1	S
CE233	Surveying Lab	0-0-3	1	T

Total Credits = 24

Hours: 28/29

Cumulative Credits= 71

SEMESTER - 4

Course Code	Course Name	L-T-P	Credits	Exam Slot
MA202	Probability Distributions, Transforms and Numerical Methods	3-1-0	4	A
CE202	Structural Analysis- I	3-1-0	4	B
CE204	Construction Technology	4-0-0	4	C
CE206	Fluid Mechanics- II	3-0-0	3	D
CE208	Geotechnical Engineering- I	3-0-0	3	E
HS210/ HS200	Life Skills/Business Economics	2-0-2/ 3-0-0	3	F
CE232	Materials Testing Lab I	0-0-3	1	S
CE234	Fluid Mechanics Lab	0-0-3	1	T

Total Credits = 23

Hours 28/27

Cumulative Credits= 94

BRANCH: **Civil Engineering**

SEMESTER - 5

Course Code	Course Name	L-T-P	Credits	Exam Slot
CE301	Design of Concrete Structures I	3-1-0	4	A
CE303	Structural Analysis- II	3-0-0	3	B
CE305	Geotechnical Engineering- II	3-0-0	3	C
CE307	Geomatics	3-0-0	3	D
CE309	Water Resources Engineering	3-0-0	3	E
	Elective 1	3-0-0	3	F
CE341	Design Project	0-1-2	2	S
CE331	Materials Testing Lab II	0-0-3	1	T
CE333	Geotechnical Engineering Lab	0-0-3	1	U

Total Credits = 23

Hours: 28

Cumulative Credits= 117

- Elective 1:-**
1. CE361 Advanced Concrete Technology
 2. CE363 Geotechnical Investigation
 3. CE365 Functional Design of Buildings
 4. CE367 Water Conveyance Systems
 5. CE369 Disaster Management
 6. CE371 Environment and Pollution
 7. CE 373 Advanced Mechanics of Materials

BRANCH: **Civil Engineering**

SEMESTER - 6

Course Code	Course Name	L-T-P	Credits	Exam Slot
CE302	Design of Hydraulic Structures	4-0-0	4	A
CE304	Design of Concrete Structures II	3-0-0	3	B
CE306	Computer Programming and Computational Techniques	3-0-0	3	C
CE308	Transportation Engineering- I	3-0-0	3	D
HS300	Principles of Management	3-0-0	3	E
	Elective 2	3-0-0	3	F
CE332	Transportation Engineering Lab	0-0-3	1	S
CE334	Computer Aided Civil Engineering Lab	0-0-3	1	T
CE352	Comprehensive Exam	0-1-1	2	U

Total Credits = 23

Hours:27, Cumulative Credits= 140

Elective 2:-

1. CE362 Ground Improvement Techniques
2. CE364 Advanced Foundation Engineering
3. CE366 Traffic Engineering and Management
4. CE368 Prestressed Concrete
5. CE372 Engineering Hydrology
6. CE374 Air Quality Management

BRANCH: **Civil Engineering**

SEMESTER - 7

Course Code	Course Name	L-T-P	Credits	Exam Slot
CE401	Design of Steel Structures	4-0-0	4	A
CE403	Structural Analysis- III	3-0-0	3	B
CE405	Environmental Engineering- I	3-0-0	3	C
CE407	Transportation Engineering -II	3-0-0	3	D
CE409	Quantity Surveying and Valuation	3-0-0	3	E
	Elective 3	3-0-0	3	F
CE451	Seminar & Project Preliminary	0-1-4	2	S
CE431	Environmental Engineering Lab	0-0-3	1	T

Total Credits = 22

Hours: 27

Cumulative Credits= 162

Elective 3:-

1. CE461 Wave Hydrodynamics and Coastal Engineering
2. CE463 Bridge Engineering
3. CE465 Geo-Environmental Engineering
4. CE467 Highway Pavement Design
5. CE469 Environmental Impact Assessment
6. CE471 Advanced Structural Design
7. CE473 Advanced Computational Techniques and Optimization

BRANCH: **Civil Engineering**

SEMESTER - 8

Course Code	Course Name	L-T-P	Credits	Exam Slot
CE402	Environmental Engineering II	3-0-0	3	A
CE404	Civil Engineering Project Management	3-0-0	3	B
	Elective 4	3-0-0	3	C
	Elective 5 (Non Departmental)	3-0-0	3	D
CE492	Project		6	S

Total Credits = 18

Hours: 30

Cumulative Credits= 180

Elective 4:-

1. CE462 Town and Country Planning
2. CE464 Reinforced Soil Structures and Geosynthetics
3. CE466 Finite Element Methods
4. CE468 Structural Dynamics and Earthquake Resistant Design
5. CE472 Transportation Planning
6. CE474 Municipal Solid Waste Management

ELECTIVE 5 (NON DEPARTMENTAL ELECTIVE COURSES)

(Note:- If a student has studied or chosen the elective course given within the brackets then the corresponding ND elective cannot be chosen)

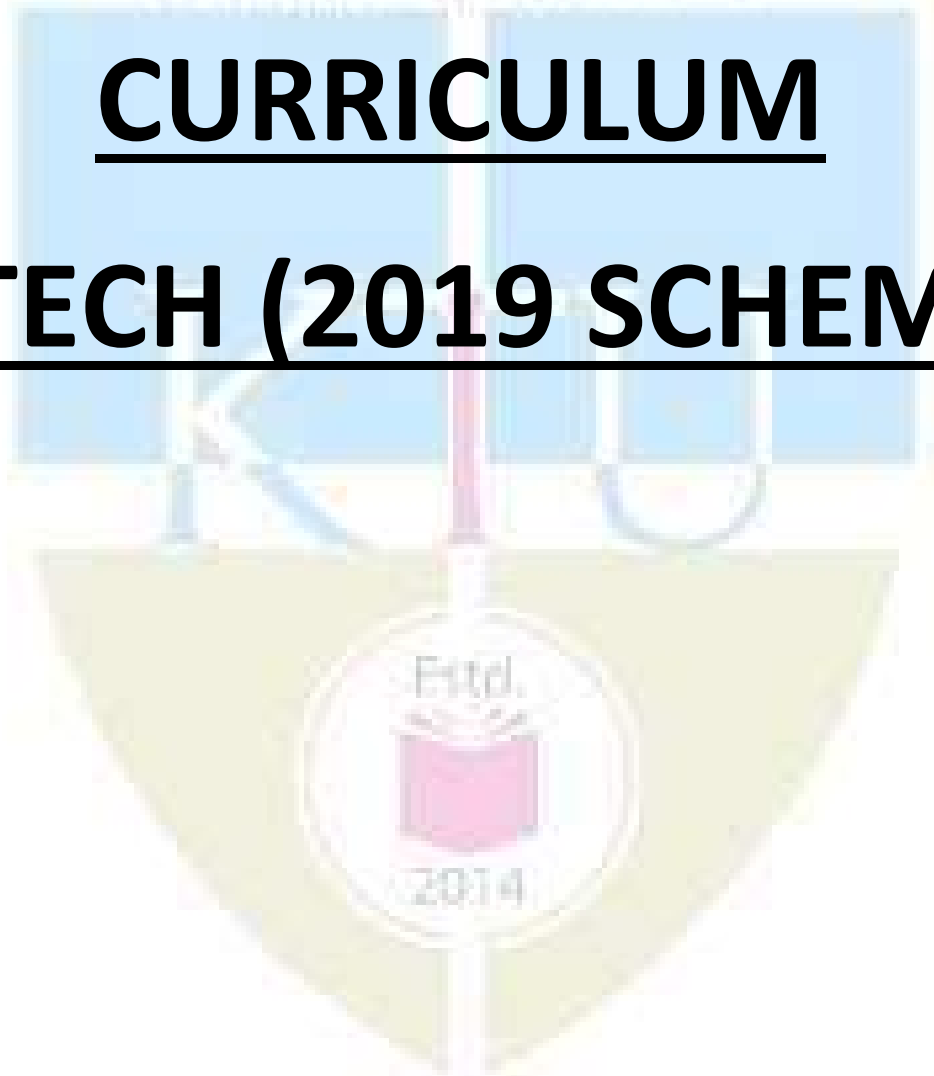
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1. AO482 FLIGHT AGAINST GRAVITY
 2. AE482 INDUSTRIAL INSTRUMENTATION
 3. AE484 INSTRUMENTATION SYSTEM DESIGN
 4. AU484 MICROPROCESSOR AND EMBEDDED SYSTEMS
 5. AU486 NOISE, VIBRATION AND HARSHNESS
 6. BM482 BIOMEDICAL INSTRUMENTATION
 7. BM484 MEDICAL IMAGING & IMAGE PROCESSING TECHNIQUES
 8. BT461 DESIGN OF BIOLOGICAL WASTEWATER SYSTEMS
 9. BT362 SUSTAINABLE ENERGY PROCESSES
 10. CH482 PROCESS UTILITIES AND PIPE LINE DESIGN
 11. CH484 FUEL CELL TECHNOLOGY
 12. CS482 DATA STRUCTURES
 13. CS484 COMPUTER GRAPHICS
 14. CS486 OBJECT ORIENTED PROGRAMMING
 15. CS488 C # AND .NET PROGRAMMING
 16. EE482 ENERGY MANAGEMENT AND AUDITING
 17. EE484 CONTROL SYSTEMS
 18. EE486 SOFT COMPUTING
 19. EE488 INDUSTRIAL AUTOMATION
 20. EE494 INSTRUMENTATION SYSTEMS
 21. EC482 BIOMEDICAL ENGINEERING
 22. FT482 FOOD PROCESS ENGINEERING
 23. FT484 FOOD STORAGE ENGINEERING

24. FT486	FOOD ADDITIVES AND FLAVOURING
25.IE482	FINANCIAL MANAGEMENT
26. IE484	INTRODUCTION TO BUSINESS ANALYTICS
27.IE486	DESIGN AND ANALYSIS OF EXPERIMENTS
28. IE488	TOTAL QUALITY MANAGEMENT
29.IC482	BIOMEDICAL SIGNAL PROCESSING
30. IT482	INFORMATION STORAGE MANAGEMENT
31. MA482	APPLIED LINEAR ALGEBRA
32. MA484	OPERATIONS RESEARCH
33. MA486	ADVANCED NUMERICAL COMPUTATIONS
34. MA488	CRYPTOGRAPHY
35.ME484	FINITE ELEMENT ANALYSIS (CE 466 FINITE ELEMENT METHODS)
36.ME482	ENERGY CONSERVATION AND MANAGEMENT
37.ME471	OPTIMIZATION TECHNIQUES (CE 473 ADVANCED COMPUTATIONAL TECHNIQUES AND OPTIMISATION)
38.MP482	PRODUCT DEVELOPMENT AND DESIGN
39. MP469	INDUSTRIAL PSYCHOLOGY & ORGANIZATIONAL BEHAVIOUR
40. MT482	INDUSTRIAL SAFETY
41. MR482	MECHATRONICS
42. FS482	RESPONSIBLE ENGINEERING
43. SB482	DREDGERS AND HARBOUR CRAFTS
44. HS482	PROFESSIONAL ETHICS

AMU ABDUL KALAM
TECHNOLOGICAL
UNIVERSITY

CURRICULUM

B.TECH (2019 SCHEME)



CURRICULUM I TO VIII: B.TECH CIVIL ENGINEERING

Every course of B. Tech. Program shall be placed in one of the nine categories as listed in table below.

Sl. No	Category	Code	Credits
1	Humanities and Social Sciences including Management courses	HMC	8
2	Basic Science courses	BSC	26
3	Engineering Science Courses	ESC	22
4	Program Core Courses	PCC	76
5	Program Elective Courses	PEC	15
6	Open Elective Courses	OEC	3
7	Project work and Seminar	PWS	10
8	Mandatory Non-credit Courses (P/F) with grade	MNC	----
9	Mandatory Student Activities (P/F)	MSA	2
	Total Mandatory Credits		162
10	Value Added Course (Optional)	VAC	20

No semester shall have more than six lecture-based courses and two laboratory and/or drawing/seminar/project courses in the curriculum. Semester-wise credit distribution shall be as below:

Sem	1	2	3	4	5	6	7	8	Total
Credits	17	21	22	22	23	23	15	17	160
Activity Points	50				50				---
Credits for Activity	2								2
G.Total									162

Basic Science Courses: Maths, Physics, Chemistry, Biology for Engineers, Life Science etc

Engineering science courses: Basic Electrical, Engineering Graphics, Programming, Workshop, Basic Electronics, Basic Civil, Engineering Mechanics, Mechanical Engineering, Thermodynamics, , Design Engineering, Materials Engineering etc.

Humanities and Social Sciences including Management courses: English, Humanities, Professional Communication, Management, Finance & Accounting, Life Skills, Professional Communication, Economics etc.

Mandatory non-credit courses: Sustainable Engineering, Constitution of India/Essence of Indian Knowledge Tradition, Industrial Safety Engineering, disaster management etc.

Course Code and Course Number

Each course is denoted by a unique code consisting of three alphabets followed by three numerals like **E C L 2 0 1**. The first two letter code refers to the department offering the course. EC stands for course in Electronics & Communication, course code MA refers to a course in Mathematics, course code ES refers to a course in Engineering Science etc. Third letter stands for the nature of the course as indicated in the Table 1.

Table 1: Code for the courses

Code	Description
T	Theory based courses (other the lecture hours, these courses can have tutorial and practical hours, e.g., L-T-P structures 3-0-0, 3-1-2, 3-0-2 etc.)
L	Laboratory based courses (where performance is evaluated primarily on the basis of practical or laboratory work with LTP structures like 0-0-3, 1-0-3, 0-1-3 etc.)
N	Non-credit courses
D	Project based courses (Major, Mini Projects)
Q	Seminar Courses

Course Number is a three digit number and the first digit refers to the Academic year in which the course is normally offered, i.e. 1, 2, 3, or 4 for the B. Tech. Programme of four year duration. Of the other two digits, the last digit identifies whether the course is offered normally in the odd (odd number), even (even number) or in both the semesters (zero). The middle number could be any digit. ECL 201 is a laboratory course offered in EC department for third semester, MAT 101 is a course in Mathematics offered in the first semester, EET 344 is a course in Electrical Engineering offered in the sixth semester, PHT 110 is a course in Physics offered both the first and second semesters, EST 102 is a course in Basic Engineering offered by one or many departments. These course numbers are to be given in the curriculum and syllabi.

Departments

Each course is offered by a Department and their two-letter course prefix is given in Table 2.

Table 2: Departments and their codes

Sl.No	Department	Course Prefix	Sl.No	Department	Course Prefix
01	Aeronautical Engg	AO	16	Information Technology	IT
02	Applied Electronics & Instrumentation	AE	17	Instrumentation & Control	IC
03	Automobile	AU	18	Mandatory Courses	MC
04	Biomedical Engg	BM	19	Mathematics	MA
05	Biotechnology	BT	20	Mechanical Engg	ME
06	Chemical Engg	CH	21	Mechatronics	MR
07	Chemistry	CY	22	Metallurgy	MT
08	Civil Engg	CE	23	Mechanical (Auto)	MU
09	Computer Science	CS	24	Mechanical(Prod)	MP
10	Electrical & Electronics	EE	25	Naval & Ship Building	SB
11	Electronics & Biomedical	EB	26	Physics	PH
12	Electronics & Communication	EC	27	Polymer Engg	PO
13	Food Technology	FT	28	Production Engg	PE
14	Humanities	HU	29	Robotics and Automation	RA
15	Industrial Engg	IE	30	Safety & Fire Engg	FS

SEMESTER I

SLO T	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	MAT 101	LINEAR ALGEBRA AND CALCULUS	3-1-0	4	4
B 1/2	PHT 110	ENGINEERING PHYSICS B	3-1-0	4	4
	CYT 100	ENGINEERING CHEMISTRY	3-1-0	4	4
C 1/2	EST 100	ENGINEERING MECHANICS	2-1-0	3	3
	EST 110	ENGINEERING GRAPHICS	2-0-2	4	3
D 1/2	EST 120	BASICS OF CIVIL & MECHANICAL ENGINEERING	4-0-0	4	4
	EST 130	BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING	4-0-0	4	4
E	HUT 101	LIFE SKILLS	2-0-2	4	--
S 1/2	PHL 120	ENGINEERING PHYSICS LAB	0-0-2	2	1
	CYL 120	ENGINEERING CHEMISTRY LAB	0-0-2	2	1
T 1/2	ESL 120	CIVIL & MECHANICAL WORKSHOP	0-0-2	2	1
	ESL 130	ELECTRICAL & ELECTRONICS WORKSHOP	0-0-2	2	1
TOTAL				23/24 *	17

*Minimum hours per week

NOTE:

To make up for the hours lost due to induction program, one extra hour may be allotted to each course

allotted to

SEMESTER II

SLO T	COURSE NO.	COURSES	L-T-P	HOURS	CREDITS
A	MAT 102	VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TRANSFORMS	3-1-0	4	4
B 1/2	PHT 110	ENGINEERING PHYSICS B	3-1-0	4	4
	CYT 100	ENGINEERING CHEMISTRY	3-1-0	4	4
C 1/2	EST 100	ENGINEERING MECHANICS	2-1-0	3	3
	EST 110	ENGINEERING GRAPHICS	2-0-2	4	3
D 1/2	EST 120	BASICS OF CIVIL & MECHANICAL ENGINEERING	4-0-0	4	4
	EST 130	BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING	4-0-0	4	4
E	HUT 102	PROFESSIONAL COMMUNICATION	2-0-2	4	--
F	EST 102	PROGRAMMING IN C	2-1-2	5	4
S 1/2	PHL 120	ENGINEERING PHYSICS LAB	0-0-2	2	1
	CYL 120	ENGINEERING CHEMISTRY LAB	0-0-2	2	1
T 1/2	ESL 120	CIVIL & MECHANICAL WORKSHOP	0-0-2	2	1
	ESL 130	ELECTRICAL & ELECTRONICS WORKSHOP	0-0-2	2	1
TOTAL				28/29	21

NOTE:

1. Engineering Physics B and Engineering Chemistry shall be offered in both semesters. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Engineering Physics B in S1 and Engineering Chemistry in S2 & vice versa. Students opting for Engineering Physics B in a semester should attend Physics Lab in the same semester and students opting for Engineering Chemistry in one semester should attend Engineering Chemistry Lab in the same semester.
2. Engineering Mechanics and Engineering Graphics shall be offered in both semesters. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Engineering Mechanics in S1 and Engineering Graphics in S2 & vice versa.
3. Basics of Civil & Mechanical Engineering and Basics of Electrical & Electronics Engineering shall be offered in both semesters. Basics of Civil & Mechanical Engineering contain equal weightage for Civil Engineering and Mechanical Engineering. Slot for the course is D with CIE marks of 25 each and ESE marks of 50 each. Students belonging to branches of AEI, EI, BME, ECE, EEE, ICE, CSE, IT, RA can choose this course in S1.

Basics of Electrical & Electronics Engineering contain equal weightage for Electrical Engineering and Electronics Engineering. Slot for the course is D with CIE marks of 25 each and ESE marks of 50 each. Students belonging to AERO, AUTO, CE, FSE, IE, ME, MECHATRONICS, PE, METTULURGY, BT, BCE, CHEM, FT, POLY can choose this course in S1. Students having Basics of Civil & Mechanical Engineering in one semester should attend Civil & Mechanical Workshop in the same semester and students having Basics of Electrical & Electronics Engineering in a semester should attend Electrical & Electronics Workshop in the same semester.

4. LIFE SKILLS

Life skills are those competencies that provide the means for an individual to be resourceful and positive while taking on life's vicissitudes. Development of one's personality by being aware of the self, connecting with others, reflecting on the abstract and the concrete, leading and generating change, and staying rooted in time-tested values and principles is being aimed at. This course is designed to enhance the employability and maximize the potential of the students by introducing them to the principles that underlie personal and professional success, and help them acquire the skills needed to apply these principles in their lives and careers.

5. PROFESSIONAL COMMUNICATION

Objective is to develop in the under-graduate students of engineering a level of competence in English required for independent and effective communication for their professional needs. Coverage: Listening, Barriers to listening, Steps to overcome them, Purposive listening practice, Use of technology in the professional world. Speaking, Fluency & accuracy in speech, Positive thinking, Improving self-expression, Tonal variations, Group discussion practice, Reading, Speed reading practice, Use of extensive readers, Analytical and critical reading practice, Writing Professional Correspondence, Formal and informal letters, Tone in formal writing, Introduction to reports. Study Skills, Use of dictionary, thesaurus etc., Importance of contents page, cover & back pages, Bibliography, Language Lab.

SEMESTER III

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	MAT201	PARTIAL DIFFERENTIAL EQUATION AND COMPLEX ANALYSIS	3-1-0	4	4
B	CET201	MECHANICS OF SOLIDS	3-1-0	4	4
C	CET203	FLUID MECHANICS& HYDRAULICS	3-1-0	4	4
D	CET205	SURVEYING & GEOMATICS	4-0-0	4	4
E 1/2	EST200	DESIGN & ENGINEERING	2-0-0	2	2
	HUT200	PROFESSIONAL ETHICS	2-0-0	2	2
F	MCN201	SUSTAINABLE ENGINEERING	2-0-0	2	--
S	CEL201	CIVIL ENGINEERING PLANNING & DRAFTING LAB	0-0-3	3	2
T	CEL203	SURVEY LAB	0-0-3	3	2
R/M	VAC	Remedial/Minor course	3-1-0	4 *	4
TOTAL				26/30	22/26

NOTE:

1. Design & Engineering and Professional Ethics shall be offered in both S3 and S4. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Design & Engineering in S3 and Professional Ethics in S4 & vice versa.
2. *All Institutions shall keep 4 hours exclusively for Remedial class/Minor course (Thursdays from 3 to 5 PM and Fridays from 2 to 4 PM). If a student does not opt for minor programme, he/she can be given remedial class.

SEMESTER IV

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	MAT202	PROBABILITY, STATISTICS AND NUMERICAL METHODS	3-1-0	4	4
B	CET202	ENGINEERING GEOLOGY	3-0-1	4	4
C	CET204	GEOTECHNICAL ENGINEERING – I	4-0-0	4	4
D	CET206	TRANSPORTATION ENGINEERING	4-0-0	4	4
E 1/2	EST200	DESIGN & ENGINEERING	2-0-0	2	2
	HUT200	PROFESSIONAL ETHICS	2-0-0	2	2
F	MCN202	CONSTITUTION OF INDIA	2-0-0	2	--
S	CEL202	MATERIAL TESTING LAB– I	0-0-3	3	2
T	CEL204	FLUID MECHANICS LAB	0-0-3	3	2
R/M/H	VAC	Remedial/Minor/Honours course	3-1-0	4*	4
TOTAL				26/30	22/26

NOTE:

1. Design & Engineering and Professional Ethics shall be offered in both S3 and S4. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Design & Engineering in S3 and Professional Ethics in S4 & vice versa.
2. *All Institutions should keep 4 hours exclusively for Remedial class/Minor course (Thursdays from 3 to 5 PM and Fridays from 2 to 4 PM). If a student does not opt for minor programme, he/she can be given remedial class.

SEMESTER V

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	CET301	STRUCTURAL ANALYSIS – I	3-1-0	4	4
B	CET303	DESIGN OF CONCRETE STRUCTURES	3-1-0	4	4
C	CET305	GEOTECHNICAL ENGINEERING – II	4-0-0	4	4
D	CET307	HYDROLOGY & WATER RESOURCES ENGINEERING	4-0-0	4	4
E	CET309	CONSTRUCTION TECHNOLOGY & MANAGEMENT	3-0-0	3	3
F	MCN301	DISASTER MANAGEMENT	2-0-0	2	--
S	CEL331	MATERIAL TESTING LAB – II	0-0-3	3	2
T	CEL333	GEOTECHNICAL ENGINEERING LAB	0-0-3	3	2
R/M/H	VAC	Remedial/Minor/Honours course	3-1-0	4*	4
TOTAL				27/31	23/27

NOTE:

1. *All Institutions should keep 4 hours exclusively for Remedial class/Minor/Honours course (Tuesdays from 3 to 5 PM and Wednesdays from 3 to 5 PM). If a student does not opt for minor/honours programme, he/she can be given remedial class.

SEMESTER VI

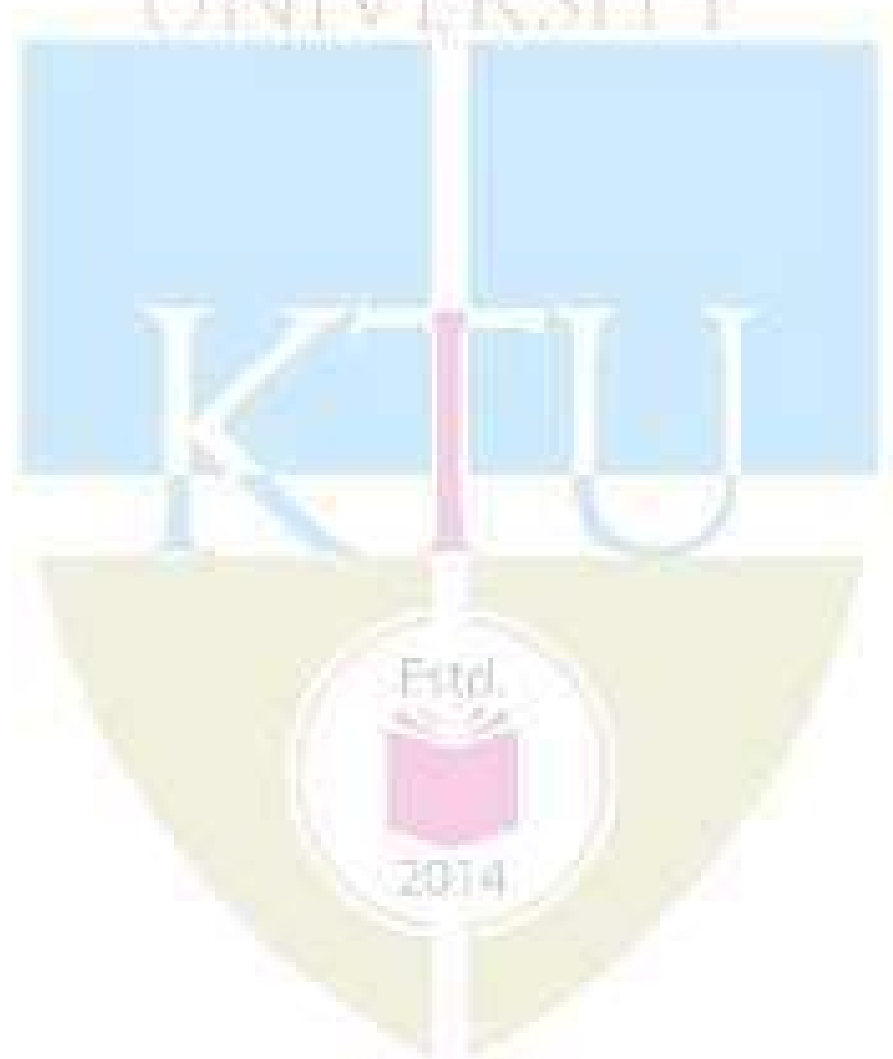
SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	CET302	STRUCTURAL ANALYSIS – II	3-1-0	4	4
B	CET304	ENVIRONMENTAL ENGINEERING	4-0-0	4	4
C	CET306	DESIGN OF HYDRAULIC STRUCTURES	4-0-0	4	4
D	CETXXX	PROGRAM ELECTIVE I	3-0-0	3	3
E	HUT300	INDUSTRIAL ECONOMICS & FOREIGN TRADE	3-0-0	3	3
F	CET308	COMPREHENSIVE COURSE WORK	1-0-0	1	1
S	CEL332	TRANSPORTATION ENGINEERING LAB	0-0-3	3	2
T	CEL334	CIVIL ENGINEERING SOFTWARE LAB	0-0-3	3	2
R/M/H	VAC	Remedial/Minor/Honours course	3-1-0	4*	4
TOTAL				25/29	23/27

PROGRAM ELECTIVE I

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
D	CET312	ADVANCED COMPUTATIONAL METHODS	3-0-0	3	3
	CET322	GEOTECHNICAL INVESTIGATION	3-0-0		
	CET332	TRAFFIC ENGINEERING & MANAGEMENT	3-0-0		
	CET342	MECHANICS OF FLUID FLOW	3-0-0		
	CET352	ADVANCED CONCRETE TECHNOLOGY	3-0-0		
	CET362	ENVIRONMENTAL IMPACT ASSESSMENT	3-0-0		
	CET372	FUNCTIONAL DESIGN OF BUILDINGS	3-0-0		

NOTE:

1. **All Institutions should keep 4 hours exclusively for Remedial class/Minor/Honours course (Tuesdays from 2 to 4 PM and Wednesdays from 2 to 4 PM). If a student does not opt for minor/honors programme, he/she can be given remedial class.
2. Comprehensive Course Work: The comprehensive course work in the sixth semester of study shall have a written test of 50 marks. The written examination will be of objective type similar to the GATE examination and will be conducted online by the University. **Syllabus for comprehensive examination shall be prepared by the respective BoS choosing any 5 core courses studied from semester 3 to 5.** The pass minimum for this course is 25. The course should be mapped with a faculty and classes shall be arranged for practising questions based on the core courses listed in the curriculum.



SEMESTER VII

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	CET401	DESIGN OF STEEL STRUCTURES	3-0-0	3	3
B	CETXXX	PROGRAM ELECTIVE II	3-0-0	3	3
C	CETXXX	OPEN ELECTIVE	3-0-0	3	3
D	MCN401	INDUSTRIAL SAFETY ENGINEERING	2-1-0	3	---
S	CEL411	ENVIRONMENTAL ENGG LAB	0-0-3	3	2
T	CEQ413	SEMINAR	0-0-3	3	2
U	CED415	PROJECT PHASE I	0-0-6	6	2
R/M/H	VAC	Remedial/Minor/Honours course	3-1-0	4*	4
TOTAL				24/28	15/19

PROGRAM ELECTIVE II

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
B	CET413	PRESTRESSED CONCRETE	3-0-0	3	3
	CET423	GROUND IMPROVEMENT TECHNIQUES	3-0-0		
	CET433	HIGHWAY MATERIALS AND DESIGN	3-0-0		
	CET443	APPLIED HYDROLOGY	3-0-0		
	CET453	CONSTRUCTION PLANNING & MANAGEMENT	3-0-0		
	CET463	ADVANCED ENVIRONMENTAL ENGINEERING	3-0-0		
	CET473	OPTIMISATION TECHNIQUES IN CIVIL ENGINEERING	3-0-0		

OPEN ELECTIVE

The open elective is offered in semester 7. Each program should specify the courses (maximum 5) they would like to offer as electives for other programs. The courses listed below are offered by **the Department of CIVIL ENGINEERING** for students of other undergraduate branches offered in the college.

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
C	CET415	ENVIRONMENTAL IMPACT ASSESSMENT	2-1-0	3	3
	CET425	APPLIED EARTH SYSTEMS	2-1-0		
	CET435	INFORMATICS FOR INFRASTRUCTURE MANAGEMENT	2-1-0		
	CET445	DISASTER MANAGEMENT	2-1-0		
	CET455	ENVIRONMENTAL HEALTH AND SAFETY	2-1-0		
	CET465	GEOINFORMATICS	2-1-0		

NOTE:

1. *All Institutions should keep 4 hours exclusively for Remedial class/Minor/Honors course (Mondays from 10 to 12 and Wednesdays from 10 to 12 Noon). If a student does not opt for minor/honours programme, he/she can be given remedial class.
2. Seminar: To encourage and motivate the students to read and collect recent and reliable information from their area of interest confined to the relevant discipline from technical publications including peer reviewed journals, conference, books, project reports etc., prepare a report based on a central theme and present it before a peer audience. Each student shall present the seminar for about 20 minutes duration on the selected topic. The report and the presentation shall be evaluated by a team of internal members comprising three senior faculty members based on style of presentation, technical content, adequacy of references, depth of knowledge and overall quality of the report.

Total marks: 100, only CIE, minimum required to pass 50

Attendance	: 10
Guide	: 20
Technical Content of the Report	: 30
Presentation	: 40

3. Project Phase I: A Project topic must be selected either from research literature or the students themselves may propose suitable topics in consultation with their guides. The object of Project Work I is to enable the student to take up investigative study in the broad field of Civil Engineering, either fully theoretical/practical or involving both theoretical and practical work to be assigned by the Department on a group of three/four students, under the guidance of a Supervisor. This is expected to provide a good initiation for the student(s) in R&D work. The assignment to normally include:
 - Survey and study of published literature on the assigned topic;
 - Preparing an Action Plan for conducting the investigation, including team work;
 - Working out a preliminary Approach to the Problem relating to the assigned topic;
 - Block level design documentation
 - Conducting preliminary Analysis/ Modelling/ Simulation/ Experiment/ Design/ Feasibility;
 - Preparing a Written Report on the Study conducted for presentation to the Department;
 - Final Seminar, as oral Presentation before the evaluation committee.

Total marks: 100, only CIE, minimum required to pass 50

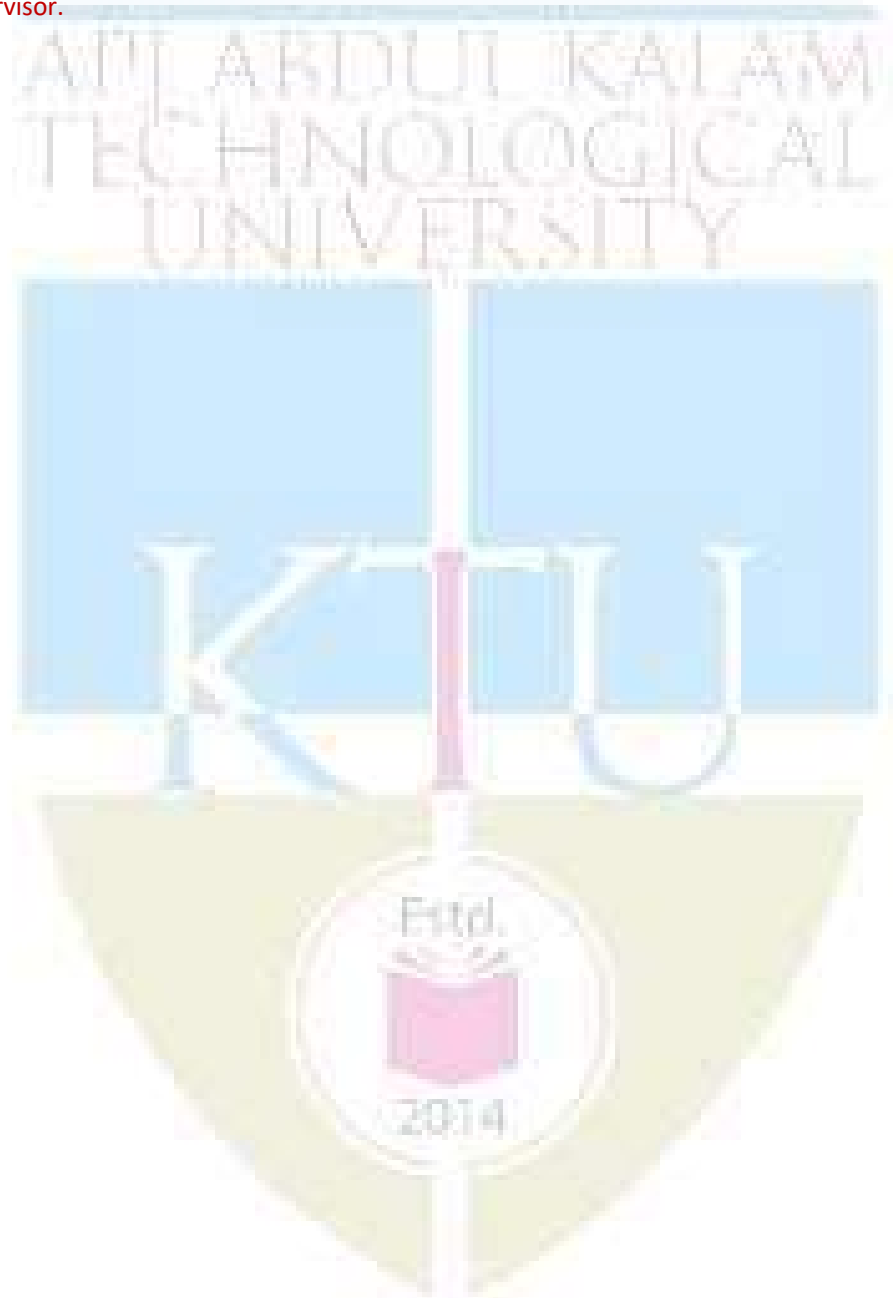
Guide : 30

Interim evaluation by the evaluation committee : 20

Final Seminar : 30

The report evaluated by the evaluation committee : 20

The evaluation committee comprises HoD or a senior faculty member, Project coordinator and project supervisor.



SEMESTER VIII

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	CET402	QUANTITY SURVEYING & VALUATION	3-0-0	3	3
B	CETXXX	PROGRAM ELECTIVE III	3-0-0	3	3
C	CETXXX	PROGRAM ELECTIVE IV	3-0-0	3	3
D	CETXXX	PROGRAM ELECTIVE V	3-0-0	3	3
E	CET404	COMPREHENSIVE VIVA VOCE	1-0-0	1	1
U	CED416	PROJECT PHASE II	0-0-12	12	4
R/M/H	VAC	Remedial/Minor/Honours course	3-1-0	4*	4
TOTAL				25/29	17/21

PROGRAM ELECTIVE III

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
B	CET414	ADVANCED STRUCTURAL DESIGN	3-0-0	3	3
	CET424	GEOENVIRONMENTAL ENGINEERING	3-0-0		
	CET434	RAILWAY AND TUNNEL ENGINEERING	3-0-0		
	CET444	IRRIGATION & DRAINAGE ENGINEERING	3-0-0		
	CET454	CONSTRUCTION METHODS & EQUIPMENT	3-0-0		
	CET464	AIRQUALITY MANAGEMENT	3-0-0		
	CET474	URBAN PLANNING & ARCHITECTURE	3-0-0		

PROGRAM ELECTIVE IV

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
C	CET416	BRIDGE ENGINEERING	3-0-0	3	3
	CET426	ADVANCED FOUNDATION DESIGN	3-0-0		
	CET436	TRANSPORTATION PLANNING	3-0-0		
	CET446	INFORMATICS FOR INFRASTRUCTURE MANAGEMENT	3-0-0		
	CET456	REPAIR AND REHABILITATION OF BUILDINGS	3-0-0		
	CET466	ENVIRONMENTAL REMOTESENSING	3-0-0		
	CET476	BULDING SERVICES	3-0-0		

PROGRAM ELECTIVE V

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
D	CET418	EARTHQUAKERESISTANT DESIGN	3-0-0	3	3
	CET428	SOIL STRUCTURE INTERACTION	3-0-0		
	CET438	AIRPORT, SEAPORT AND HARBOUR ENGINEERING	3-0-0		
	CET448	HYDROCLIMATOLOGY	3-0-0		
	CET458	SUSTAINABLE CONSTRUCTION	3-0-0		
	CET468	CLIMATE CHANGE & SUSTAINABILITY	3-0-0		
	CET478	BUILDING INFORMATION MODELLING	3-0-0		

NOTE

- *All Institutions should keep 4 hours exclusively for Remedial class/Minor/Honours course (Mondays from 10 to 12 and Wednesdays from 10 to 12). If a student does not opt for minor/honors programme, he/she can be given remedial class.
- Comprehensive Course Viva:** The comprehensive course viva in the eighth semester of study shall have a viva voce for 50 marks. The viva voce shall be conducted based on the syllabus mentioned for comprehensive course work in the sixth semester. The viva voce will be conducted by the same three member committee assigned for final project phase II evaluation towards the end of the semester. The pass minimum for this course is 25. The course should be mapped with a faculty and classes shall be arranged for practising questions based on the core courses listed in the curriculum. The mark will be treated as internal and should be uploaded along with internal marks of other courses.
- Project Phase II:** The object of Project Work II & Dissertation is to enable the student to extend further the investigative study taken up in Project 1, either fully theoretical/practical or involving both theoretical and practical work, under the guidance of a Supervisor from the Department alone or jointly with a Supervisor drawn from R&D laboratory/Industry. This is expected to provide a good training for the student(s) in R&D work and technical leadership. The assignment to normally include:
 - In depth study of the topic assigned in the light of the Report prepared under Phasel;
 - Review and finalization of the Approach to the Problem relating to the assigned topic;
 - Detailed Analysis/ Modelling/ Simulation/ Design/ Problem Solving/ Experiment as needed;
 - Final development of product/process, testing, results, conclusions and future directions;
 - Preparing a paper for Conference presentation/Publication in Journals, if possible;
 - Preparing a Dissertation in the standard format for being evaluated by the Department;
 - Final Presentation before a Committee

Total marks: 150, only CIE, minimum required to pass 75

Guide : 30

Interim evaluation, 2 times in the semester by the evaluation committee : 50

Quality of the report evaluated by the above committee : 30

Final evaluation by a three member committee : 40

(The final evaluation committee comprises Project coordinator, expert from Industry/research Institute

and a senior faculty from a sister department. The same committee will conduct comprehensive course viva for 50 marks).

MINOR

Minor is an additional credential a student may earn if s/he does 20 credits worth of additional learning in a discipline other than her/his major discipline of B.Tech. degree. The objective is to permit a student to customize their Engineering degree to suit their specific interests. Upon completion of an Engineering Minor, a student will be better equipped to perform interdisciplinary research and will be better employable. Engineering Minors allow a student to gain interdisciplinary experience and exposure to concepts and perspectives that may not be a part of their major degree programs.

The academic units offering minors in their discipline will prescribe the set of courses and/or other activities like projects necessary for earning a minor in that discipline. A specialist basket of 3-6 courses is identified for each Minor. Each basket may rest on one or more foundation courses. A basket may have sequences within it, i.e., advanced courses may rest on basic courses in the basket. S/he accumulates credits by registering for the required courses, and if the requirements for a particular minor are met within the time limit for the course, the minor will be awarded. This will be mentioned in the Degree Certificate as "Bachelor of Technology in xxx with Minor in yyy". The fact will also be reflected in the consolidated grade card, along with the list of courses taken. If one specified course cannot be earned during the course of the programme, that minor will not be awarded. The individual course credits earned, however, will be reflected in the consolidated grade card.

(i) The curriculum/syllabus committee/BoS shall prepare syllabus for courses to be included in the curriculum from third to eight semesters for all branches. The minor courses shall be identified by **M slot courses**.

(ii) Registration is permitted for Minor at the beginning of third semester. Total credits required is 182 (162 + 20 credits from value added courses)

(iii) Out of the 20 Credits, 12 credits shall be earned by undergoing a minimum of three courses listed in the curriculum for minor, of which one course shall be a mini project based on the chosen area. They can do miniproject either in S7 or in S8. The remaining 8 credits could be acquired by undergoing 2 MOOCs recommended by the Board of studies and approved by the Academic Council or through courses listed in the curriculum. The classes for Minor shall be conducted along with regular classes and no extra time shall be required for conducting the courses.

(iv) There won't be any supplementary examination for the courses chosen for Minor.

(v) On completion of the program, "Bachelor of Technology in xxx with Minor in yyy" will be awarded.

(vi) The registration for minor program will commence from semester 3 and the all academic units offering minors in their discipline should prescribe set of such courses. The courses shall be grouped into maximum of 3 baskets. The basket of courses may have sequences within it, i.e., advanced courses may rest on basic courses in the basket. Reshuffling of courses between various baskets will not be allowed. In any case, they should carry out a mini project based on the chosen area in S7 or S8. Students who have registered for **B.Tech Minor in CIVIL ENGINEERING Branch** can opt to study the courses listed below:

S e m e s t e r	BASKET I				BASKET II				BASKET III			
	Course No.	Course Name	H O U R S	C R E D I T	Course No.	Course Name	H O U R S	C R E D I T	Course No.	Course Name	H O U R S	C R E D I T
S3	CET281	Building construction & structural systems	4	4	CET283	Introduction to Geotechnical Engineering	4	4	CET285	Informatics for Infrastructure Management	4	4
S4	CET282	Building drawing	4	4	CET284	Introduction to Transportation Engineering	4	4	CET286	Climate change & hazard mitigation	4	4
S5	CET381	Structural mechanics	4	4	CET383	Eco-friendly transportation systems	4	4	CET385	Sustainability analysis & design	4	4
S6	CET382	Estimation & costing	4	4	CET384	Geotechnical investigation & ground improvement techniques	4	4	CET386	Environmental health & safety	4	4
S7	CED481	MINI PROJECT	4	4	CED481	MINI PROJECT	4	4	CED481	MINI PROJECT	4	4
S8	CED482	MINI PROJECT	4	4	CED482	MINI PROJECT	4	4	CED482	MINI PROJECT	4	4

HONOURS

Honours is an additional credential a student may earn if s/he opts for the extra 20 credits needed for this in her/his own discipline. Honours is not indicative of class. KTU is providing this option for academically extra brilliant students to acquire Honours. Honours is intended for a student to gain expertise/specialise in an area inside his/her major B.Tech discipline and to enrich knowledge in emerging/advanced areas in the branch of engineering concerned. It is particularly suited for students aiming to pursue higher studies. Upon completion of Honours, a student will be better equipped to perform research in her/his branch of engineering. On successful accumulation of credits at the end of the programme, this will be mentioned in the Degree Certificate as "Bachelor of Technology in xxx, with Honours." The fact will also be reflected in the consolidated grade card, along with the list of courses taken. If one specified course cannot be earned during the course of the programme, Honours will not be awarded. The individual course credits earned, however, will be reflected in the consolidated grade card.

The courses shall be grouped into maximum of 3 groups, each group representing a particular specialization in the branch. The students shall select only the courses from same group in all semesters. It means that the specialization is to be fixed by the student and cannot be changed subsequently. The internal evaluation, examination and grading shall be exactly as for other mandatory courses. The Honours courses shall be identified by H slot courses.

- (i) The curriculum/syllabus committee/BOS shall prepare syllabus for courses to be included in the curriculum from fourth to eight semesters for all branches. The honours courses shall be identified by H slot courses.

- (ii) Registration is permitted for Honours at the beginning of fourth semester. Total credits required is 182 (162 + 20 credits from value added courses).
- (iii) Out of the 20 Credits, 12 credits shall be earned by undergoing a minimum of three courses listed in the curriculum for honours, of which one course shall be a mini project based on the chosen area. The remaining 8 credits could be acquired by undergoing 2 MOOCs recommended by the Board of studies and approved by the Academic Council or through courses listed in the curriculum. The classes for Honours shall be conducted along with regular classes and no extra time shall be required for conducting the courses. The students should earn a grade of 'C' or better for all courses under honours.
- (iv) There won't be any supplementary examination for the courses chosen for honours.
- (v) On successful accumulation of credits at the end of the programme, "Bachelor of Technology in xxx, with Honours" will be awarded if overall CGPA is greater than or equal to 8.5, earned a grade of 'C' or better for all courses chosen for honours and without any history of 'F' Grade.
- (vi) The registration for honours program will commence from semester 4 and the all academic units offering honours in their discipline should prescribe set of such courses. The courses shall be grouped into maximum of 3 groups, each group representing a particular specialization in the branch. The students shall select only the courses from same group in all semesters. It means that the specialization is to be fixed by the student and cannot be changed subsequently. In any case, they should carry out a mini project based on the chosen area in S8. Students who have registered for **B.Tech Honours in CIVIL ENGINEERING** can opt to study the courses listed below:

S e m e s t e r	GROUP I				GROUP II				GROUP III			
	Course No.	Course Name	H O U R S	C R E D I T	Course No.	Course Name	H O U R S	C R E D I T	Course No.	Course Name	H O U R S	C R E D I T
S 4	CET292	ADVANCED MECHANICS OF SOLIDS	4	4	CET294	PAVEMENT CONSTRUCTION AND MANAGEMENT	4	4	CET296	GEOGRAPHICAL INFORMATION SYSTEMS	4	4
S 5	CET393	STRUCTURAL DYNAMICS	4	4	CET395	TRANSPORTATION SYSTEMS MANAGEMENT	4	4	CET397	GROUND WATER HYDROLOGY	4	4
S 6	CET394	FINITE ELEMENT METHODS	4	4	CET396	EARTH DAMS AND EARTH RETAINING STRUCTURES	4	4	CET398	ENVIRONMENTAL POLLUTION MODELLING	4	4
S 7	CET495	MODERN CONSTRUCTION MATERIALS	4	4	CET497	SOIL DYNAMICS AND MACHINE FOUNDATIONS	4	4	CET499	ENVIRONMENTAL POLLUTION CONTROL TECHNIQUES	4	4
S 8	CED496	MINI PROJECT	4	4	CED496	MINI PROJECT	4	4	CED496	MINI PROJECT	4	4

INDUCTION PROGRAM

There will be three weeks induction program for first semester students. It is a unique three-week immersion Foundation Programme designed especially for the fresher's which includes a wide range of activities right from workshops, lectures and seminars to sports tournaments, social work and much more. The programme is designed to mould students into well-rounded individuals, aware and sensitized to local and global conditions and foster their creativity, inculcate values and ethics, and help students to discover their passion. Foundation Programme also serves as a platform for the fresher's to interact with their batchmates and seniors and start working as a team with them. The program is structured around the following five themes:

The programme is designed keeping in mind the following objectives:

- **Values and Ethics:** Focus on fostering a strong sense of ethical judgment and moral fortitude.
- **Creativity:** Provide channels to exhibit and develop individual creativity by expressing themselves through art, craft, music, singing, media, dramatics, and other creative activities.
- **Leadership, Communication and Teamwork:** Develop a culture of teamwork and group communication.
- **Social Awareness:** Nurture a deeper understanding of the local and global world and our place in it as concerned citizens of the world.
- **Physical Activities & Sports:** Engage students in sports and physical activity to ensure healthy physical and mental growth.





VISWAJYOTHI COLLEGE OF ENGINEERING & TECHNOLOGY

(Approved by AICTE, Affiliated to APJ Abdul Kalam Technological University, Kerala)

Vazhakulam P.O., Muvattupuzha, Ernakulam Dist., Kerala, India - 686 670

Ph: 0485 2262211, 2262244, 2262255, 2262977, Fax : 0485 2262211

Web : www.vjcet.ac.in E-mail : vjcet@vjcet.org, vjcvklm@gmail.com



All B.Tech Programmes (CE, CSE, ECE, EEE, IT & ME) Accredited by NBA

Date : 28/04/2021

Self Declaration

Subject: Reference to metric number 1.3.2. Experiential learning courses in the curriculum apart from Project work/ Internship/ field work

In Computer Science and Engineering, for undergraduate programme, semesters from 1 to 6 consists of 8 courses out of which 2 are laboratory courses and semester 7 consists of 1 laboratory course as per APJ Abdul Kalam Technological University in addition to project work/Internships/Field work. In MG university, for undergraduate programme, semesters from 1 to 5 and semester 7 consists of 8 courses out of which 2 are laboratory courses and semester 6 and 8 consists of 1 laboratory course. In Mtech in Computer Science and Engineering, semesters 1 and 2 consists of 1 laboratory course as per APJ Abdul Kalam Technological University. In laboratory courses, students undergo experiential learning related to one or more theory courses. Thus each student goes through more than 30% of experiential learning in each semester.




Dr. K.K. Rajan
Principal
Viswajyothi College of Engineering & Technology
Vazhakulam P.O., Muvattupuzha, Kerala-686 670

Note: Sample copy of scheme and syllabus is enclosed along with this letter.

Mahatma Gandhi University Revised Scheme For
B Tech Syllabus Revision 2010 (Computer Science & Engineering)

Common for All Branches
SCHEME S1&S2

Code	Subject	Hours/week			Marks		End-sem duration- hours	Credits
		L	T	P/D	Internal	End-sem		
EN010 101	Engineering Mathematics I	2	1	-	50	100	3	5
EN010 102	Engineering Physics	1	1	-	50	100	3	4
EN010 103	Engineering Chemistry & Environmental Studies	1	1	-	50	100	3	4
EN010 104	Engineering Mechanics	3	1	-	50	100	3	6
EN010 105	Engineering Graphics	1	3	-	50	100	3	6
EN010 106	Basic Civil Engineering	1	1	-	50	100	3	4
EN010 107	Basic Mechanical Engineering	1	1	-	50	100	3	4
EN010 108	Basic Electrical Engineering	1	1	-	50	100	3	4
EN010 109	Basic Electronics Engg. & Information Technology	2	1	-	50	100	3	5
EN010 110	Mechanical Workshop	-	-	3	50	-	3	1
EN110 111	Electrical and Civil Workshops	-	-	3	100	-	3	1
	Total	13	11	6			30	44

3rd Semester

Code	Subject	Hours/week			Marks			
		L	T	P/D	Internal	End-sem		
EN010 301B	Engineering Mathematics II	2	2	-	50	100	3	4
EN010 302	Economics and Communication Skills	2	2	-	50	100	3	4 (3+1)
CS010 303	Problem Solving and Computer Programming	2	2	-	50	100	3	4
CS010 304	Computer Organization	3	1	-	50	100	3	4
CS010 305	Switching Theory and Logic Design	3	1	-	50	100	3	4
CS010 306(EC)	Electronics Devices and Circuits	3	1	-	50	100	3	4
CS010 307	Programming lab	-	-	3	50	100	3	2
CS010 308(EC)	Logic Design lab	-	-	3	50	100	3	2
	Total	16	8	6				28

4th Semester

Code	Subject	Hours/week			Marks		End-sem duration -hours	Credits
		L	T	P/D	Internal	End-sem		
EN010 401	Engineering Mathematics III	2	2	-	50	100	3	4
CS010 402	Object Oriented Programming	3	1		50	100	3	4
CS010 403	Data Structures and Algorithms	2	2	-	50	100	3	4
CS010 404(EC)	Signals & Communication Systems	3	1	-	50	100	3	4
CS010 405	Microprocessor Systems	3	1	-	50	100	3	4
CS010 406	Theory of Computation	3	1	-	50	100	3	4
CS010 407	Data Structures lab	-	-	3	50	100	3	2
CS010 408(EC)	Electronic Circuits lab	-	-	3	50	100	3	2
	Total	16	8	6				28

5th Semester

Code	Subject	Hours/week			Marks		End-sem duration -hours	Credits
		L	T	P/D	Internal	End-sem		
EN010 501B	Engineering Mathematics IV	2	2	-	50	100	3	4
EN010 502(ME)	Principles of Management	3	1		50	100	3	4
CS010 503	Database Management Systems	2	2	-	50	100	3	4
CS010 504(EC)	Digital Signal Processing	3	1	-	50	100	3	4
CS010 505	Operating Systems	3	1	-	50	100	3	4
CS010 506	Advanced Microprocessors & Peripherals	3	1	-	50	100	3	4
CS010 507(P)	Database Lab	-	-	3	50	100	3	2
CS010 508(P)	Hardware & Microprocessors lab	-	-	3	50	100	3	2
	Total	16	8	6				28

6th Semester

Code	Subject	Hours/week			Marks		End-sem duration -hours	Cred its
		L	T	P/D	Inte- rnal	End- sem		
CS010 601	Design and Analysis of Algorithms	2	2	-	50	100	3	4
CS010 602	Internet Computing	2	2	-	50	100	3	4
CS010 603	System Software	3	1	-	50	100	3	4
CS010 604	Computer Networks	3	1	-	50	100	3	4
CS010 605	Software Engineering	3	1	-	50	100	3	4
CS010 606Lxx	Elective I	2	2	-	50	100	3	4
CS010 607	Operating Systems Lab	-	-	3	50	100	3	2
CS010 608	Mini Project	-	-	3	50	100	3	2
	Total	15	9	6				28

Elective I

CS010 606L01	Distributed Systems
CS010 606L02	Micro controller Based Systems
CS010 606L03	User Interface Design
CS010 606L04	Unix Shell Programming
CS010 606L05	Embedded Systems
CS010 606L06	Advanced Software Environments

7th Semester

Code	Subject	Hours/week			Marks		End- sem dura- tion- hour s	Cred its
		L	T	P/D	Inte- rnal	End- sem		
CS010 701	Web Technologies	2	2	-	50	100	3	4
CS010 702	Compiler Construction	2	2	-	50	100	3	4
CS010 703	Computer Graphics	2	1	-	50	100	3	3
CS010 704	Object Oriented Modelling & Design	2	1	-	50	100	3	3
CS010 705	Principles of Programming Languages	2	1	-	50	100	3	3
CS010 706Lxx	Elective II	2	2	-	50	100	3	4
CS010 707	Systems Programming Lab	-	-	3	50	100	3	2
CS010 708	Networking lab	-	-	3	50	100	3	2
CS010 709	Seminar	-	-	2	50	-	-	2
CS010 710	Project	-	-	1	50	-	-	1
	Total	12	9	9				28

Elective II

CS010 706L01	Real Time Systems
CS010 706L02	Data Mining and Data Warehousing
CS010 706L03	Operating System Kernel Design
CS010 706L04	Digital image processing
CS010 706L05	Data Processing and File Structures
CS010 706L06	Client Server Architecture and Applications

8th Semester

Code	Subject	Hours/week			Marks		End-sem duration- hours	Cre dits
		L	T	P/D	Inter- nal	End- sem		
CS010 801	High Performance Computing	3	2	-	50	100	3	4
CS010 802	Artificial Intelligence	2	2	-	50	100	3	4
CS010 803	Security in Computing	2	2	-	50	100	3	4
CS010 804Lxx	Elective III	2	2	-	50	100	3	4
CS010 805Gxx	Elective IV	2	2	-	50	100	3	4
CS010 806	Computer Graphics Lab	-	-	3	50	100	-	2
CS010 807	Project	-	-	6	100	0	3	4
CS010 808	Viva Voce	-	-	-	-	50	-	2
	Total	11	10	9				28

Elective III

CS010 804L01	E-commerce
CS010 804L02	Grid Computing
CS010 804L03	Bioinformatics
CS010 804L04	Optimization Techniques
CS010 804L05	Mobile Computing
CS010 804L06	Advanced Networking Trends

Elective IV

CS010 805G01	Multimedia Techniques
CS010 805G02	Neural networks
CS010 805G03	Advanced Mathematics
CS010 805G04	Software Architecture
CS010 805G05	Natural Language Processing
CS010 805G06	Pattern Recognition



KERALA TECHNOLOGICAL UNIVERSITY

Curriculum for Semesters I and II

2015

Kerala Technological University
CET Campus, Thiruvananthapuram
Kerala -695016 India
Phone +91 471 2598122, 2598422
Fax +91 471 2598522
Web: ktu.edu.in
Email: university@ktu.edu.in

SEMESTER I

Slot	Course No.	Subject	L-T-P	Hours	Credits
A	MA101	Calculus	3-1-0	4	4
B (1/2)	PH100	Engineering Physics	3-1-0	4	4
	CY100	Engineering Chemistry	3-1-0	4	4
C (1/2)	BE100	Engineering Mechanics	3-1-0	4	4
	BE110	Engineering Graphics	1-1-2	4	3
D	BE101-0X	Introduction to _____ Engineering	2-1-0	3	3
E	BE103	Introduction to Sustainable Engineering	2-0-1	3	3
F (1/4)	CE100	Basics of Civil Engineering	2-1-0	3	3
	ME100	Basics of Mechanical Engineering	2-1-0	3	3
	EE100	Basics of Electrical Engineering	2-1-0	3	3
	EC100	Basics of Electronics Engineering	2-1-0	3	3
S (1/2)	PH110	Engineering Physics Lab	0-0-2	2	1
	CY110	Engineering Chemistry Lab	0-0-2	2	1
T (2/4)	CE110/ME110/ EE110/EC110/ CS110/CH110	Basic Engineering Workshops (CS110 for CS and related branches and CH110 for CH and related branches only)	0-0-2 + 0-0-2	2 2	1 1
U		U100 Language lab/ Bridge courses/ Remedial programmes/Micro Projects etc	0-0-3	3	
				30	24/23
V		V100 Entrepreneurship/TBI/NCC/NSS/ Physical Edn. etc	0-0-2	2	Activity points

SEMESTER II

Slot	Course No.	Subject	L-T-P	Hours	Credits
A	MA102	Differential Equations	3-1-0	4	4
B (1/2)	PH100	Engineering Physics	3-1-0	4	4
	CY100	Engineering Chemistry	3-1-0	4	4
C (1/2)	BE100	Engineering Mechanics	3-1-0	4	4
	BE110	Engineering Graphics	1-1-2	4	3
D	BE102	Design & Engineering	2-0-2	4	3
E, F (2/4)	CE 100	Basics of Civil Engineering	2-1-0	3	3
	ME 100	Basics of Mechanical Engineering	2-1-0	3	3
	EE 100	Basics of Electrical Engineering	2-1-0	3	3
	EC 100	Basics of Electronics Engineering	2-1-0	3	3
S (1/2)	PH110	Engineering Physics Lab	0-0-2	2	1
	CY110	Engineering Chemistry Lab	0-0-2	2	1
T (2/4)	CE110/ME110/ EE110/EC110	Basic Engineering Workshops	0-0-2 + 0-0-2	2 2	1 1
U		U100 Language lab / Bridge courses/ Remedial programmes/Micro Projects etc	0-0-2	2	
				30	24/23
V		V100 Entrepreneurship /TBI/NCC/NSS/ Physical Edn. etc	0-0-2	2	Activity points

Note: 1. Institutions can assign **two of four** Basics of Engineering courses not already taken by the student in the previous semester and the corresponding Workshop courses in Semester 2.



APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

**Curriculum
for
B.Tech Degree
Semesters III to VIII
2016
Computer Science and Engineering**

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

CET CAMPUS, THIRUVANANTHAPURAM – 695016

KERALA, INDIA

Phone +91 471 2598122, 2598422

Fax +91 471 2598522 Web: ktu.edu.in

Email: university@ktu.edu.in

BRANCH: Computer Science & Engineering**SEMESTER - 3**

Course Code	Course Name	L-T-P	Credits	Exam Slot
MA201	Linear Algebra & Complex Analysis	3-1-0	4	A
CS201	Discrete Computational Structures	3-1-0	4	B
CS203	Switching Theory and Logic Design	3-1-0	4	C
CS205	Data Structures	3-1-0	4	D
CS207	Electronics Devices & Circuits	3-0-0	3	E
HS210/ HS200	Life Skills/Business Economics	2-0-2/ 3-0-0	3	F
CS231	Data Structures Lab	0-0-3	1	S
CS233	Electronics Circuits Lab	0-0-3	1	T

Total Credits = 24**Hours: 28/29****Cumulative Credits= 71****SEMESTER - 4**

Course Code	Course Name	L-T-P	Credits	Exam Slot
MA202	Probability Distributions, Transforms and Numerical Methods	3-1-0	4	A
CS202	Computer Organization and Architecture	3-1-0	4	B
CS204	Operating Systems	3-1-0	4	C
CS206	Object Oriented Design and Programming	2-1-0	3	D
CS208	Principles of Database Design	2-1-0	3	E
HS210/ HS200	Life Skills/Business Economics	2-0-2/ 3-0-0	3	F
CS232	Free and Open Source Software Lab	0-0-3	1	S
CS234	Digital Systems Lab	0-0-3	1	T

Total Credits = 23**Hours 28/27****Cumulative Credits= 94**

BRANCH: **Computer Science & Engineering**

SEMESTER - 5

Course Code	Course Name	L-T-P	Credits	Exam Slot
CS301	Theory of Computation	3-1-0	4	A
CS303	System Software	2-1-0	3	B
CS305	Microprocessors and Microcontrollers	2-1-0	3	C
CS307	Data Communication	3-0-0	3	D
CS309	Graph Theory and Combinatorics	2-0-2	3	E
	Elective 1	3-0-0	3	F
CS341	Design Project	0-1-2	2	S
CS331	System Software Lab	0-0-3	1	T
CS333	Application Software Development Lab	0-0-3	1	U

Total Credits = 23

Hours: 29 Cumulative Credits= 117

- Elective 1:-**
1. CS361 Soft Computing
 2. CS363 Signals and Systems
 3. CS365 Optimization Techniques
 4. CS367 Logic for Computer Science
 5. CS369 Digital System Testing & Testable Design

BRANCH: **Computer Science & Engineering**

SEMESTER - 6

Course Code	Course Name	L-T-P	Credits	Exam Slot
CS302	Design and Analysis of Algorithms	3-1-0	4	A
CS304	Compiler Design	3-0-0	3	B
CS306	Computer Networks	3-0-0	3	C
CS308	Software Engineering and Project Management	3-0-0	3	D
HS300	Principles of Management	3-0-0	3	E
	Elective 2	3-0-0	3	F
CS332	Microprocessor Lab	0-0-3	1	S
CS334	Network Programming Lab	0-0-3	1	T
CS352	Comprehensive Exam	0-1-1	2	U

Total Credits = 23

Hours: 27

Cumulative Credits= 140

Elective 2:-

1. CS362 Computer Vision
2. CS364 Mobile Computing
3. CS366 Natural Language Processing
4. CS368 Web Technologies
5. CS372 High Performance Computing

BRANCH: **Computer Science & Engineering**

SEMESTER - 7

Course Code	Course Name	L-T-P	Credits	Exam Slot
CS401	Computer Graphics	4-0-0	4	A
CS403	Programming Paradigms	3-0-0	3	B
CS405	Computer System Architecture	3-0-0	3	C
CS407	Distributed Computing	3-0-0	3	D
CS409	Cryptography and Network Security	3-0-0	3	E
	Elective 3	3-0-0	3	F
CS451	Seminar & Project Preliminary	0-1-4	2	S
CS431	Compiler Design Lab	0-0-3	1	T

Total Credits = 22

Hours: 27

Cumulative Credits= 162

Elective 3:-

1. CS461 Computational Geometry
2. CS463 Digital Image Processing
3. CS465 Bio Informatics
4. CS467 Machine Learning
5. CS469 Computational complexity

BRANCH: **Computer Science & Engineering**

SEMESTER - 8

Course Code	Course Name	L-T-P	Credits	Exam Slot
CS402	Data Mining and Ware Housing	3-0-0	3	A
CS404	Embedded Systems	3-0-0	3	B
	Elective 4	3-0-0	3	C
	Elective 5 (Non Departmental)	3-0-0	3	D
CS492	Project		6	S

Total Credits = 18

Hours: 30

Cumulative Credits= 180

Elective 4:-

1. CS462 Fuzzy Set Theory and Applications
2. CS464 Artificial Intelligence
3. CS466 Data Science
4. CS468 Cloud Computing
5. CS472 Principles of Information Security

ELECTIVE 5 (NON DEPARTMENTAL ELECTIVE COURSES)

(Note:- If a student has studied or chosen the elective course given within the brackets then the corresponding ND elective cannot be chosen)

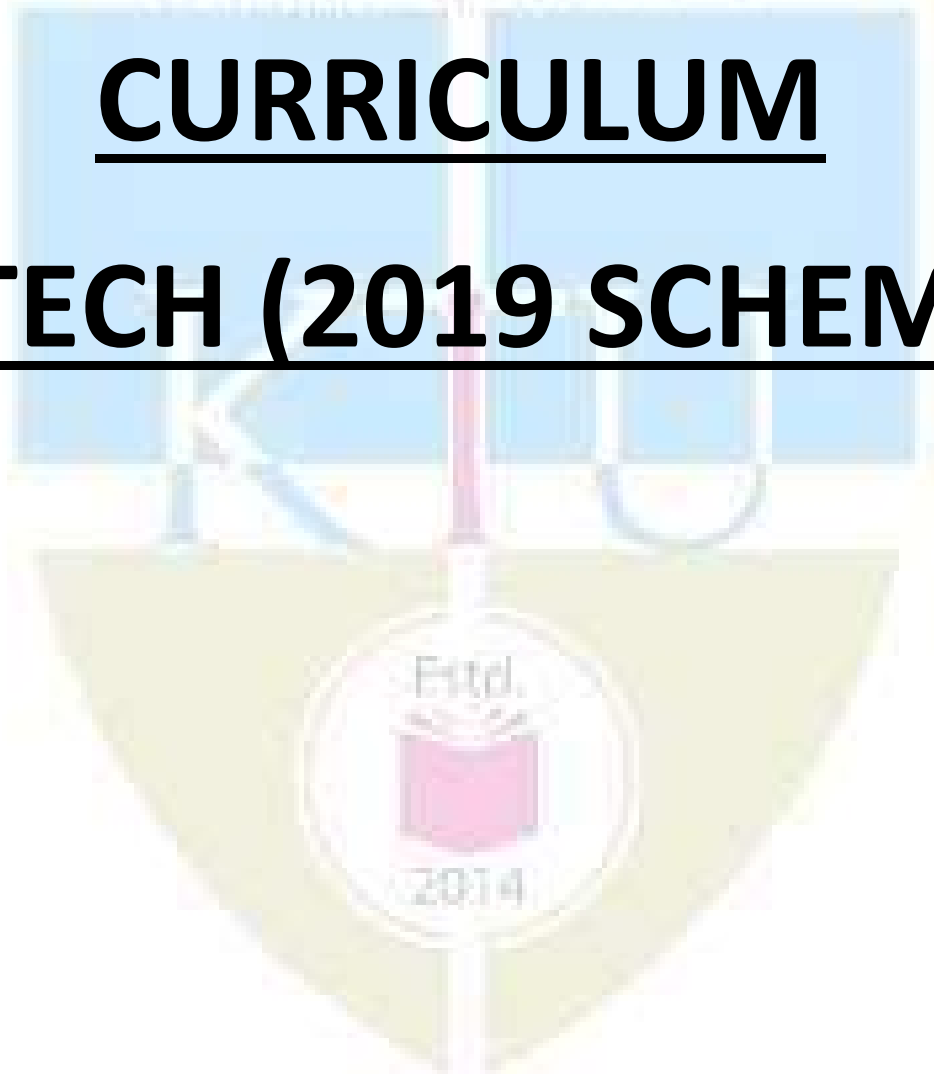
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1. AO482 FLIGHT AGAINST GRAVITY
 2. AE482 INDUSTRIAL INSTRUMENTATION
 3. AE484 INSTRUMENTATION SYSTEM DESIGN
 4. AU486 NOISE, VIBRATION AND HARSHNESS
 5. BM482 BIOMEDICAL INSTRUMENTATION
 6. BM484 MEDICAL IMAGING & IMAGE PROCESSING TECHNIQUES
 7. BT461 DESIGN OF BIOLOGICAL WASTE WATER SYSTEMS
 8. BT362 SUSTAINABLE ENERGY PROCESSES
 9. CH482 PROCESS UTILITIES AND PIPE LINE DESIGN
 10. CH484 FUEL CELL TECHNOLOGY
 11. CE482 ENVIRONMENTAL IMPACT ASSESSMENT
 12. CE484 APPLIED EARTH SYSTEMS
 13. CE486 GEO INFORMATICS FOR INFRASTRUCTURE MANAGEMENT
 14. CE488 DISASTER MANAGEMENT
 15. CE494 ENVIRONMENT HEALTH AND SAFETY
 16. EE482 ENERGY MANAGEMENT AND AUDITING
 17. EE484 CONTROL SYSTEMS
 18. EE486 SOFT COMPUTING (CS 361 SOFT COMPUTING)
 19. EE488 INDUSTRIAL AUTOMATION
 20. EE494 INSTRUMENTATION SYSTEMS
 21. EC482 BIOMEDICAL ENGINEERING
 22. FT482 FOOD PROCESS ENGINEERING
 23. FT484 FOOD STORAGE ENGINEERING

24. FT486	FOOD ADDITIVES AND FLAVOURING
25. IE482	FINANCIAL MANAGEMENT
26. IE484	INTRODUCTION TO BUSINESS ANALYTICS
27. IE486	DESIGN AND ANALYSIS OF EXPERIMENTS
28. IE488	TOTAL QUALITY MANAGEMENT
29. IC482	BIOMEDICAL SIGNAL PROCESSING
30. IT482	INFORMATION STORAGE MANAGEMENT
31. MA482	APPLIED LINEAR ALGEBRA
32. MA484	OPERATIONS RESEARCH (CS 365 OPTIMISATION TECHNIQUES)
33. MA486	ADVANCED NUMERICAL COMPUTATIONS
34. ME484	FINITE ELEMENT ANALYSIS
35. ME482	ENERGY CONSERVATION AND MANAGEMENT
36. ME471	OPTIMIZATION TECHNIQUES (CS 365 OPTIMISATION TECHNIQUES)
37. MP482	PRODUCT DEVELOPMENT AND DESIGN
38. MP469	INDUSTRIAL PSYCHOLOGY & ORGANIZATIONAL BEHAVIOUR
39. MT482	INDUSTRIAL SAFETY
40. MR482	MECHATRONICS
41. FS482	RESPONSIBLE ENGINEERING
42. SB482	DREDGERS AND HARBOUR CRAFTS
43. HS482	PROFESSIONAL ETHICS

AMU ABDUL KALAM
TECHNOLOGICAL
UNIVERSITY

CURRICULUM

B.TECH (2019 SCHEME)



Computer Science and Engineering**CURRICULUM FROM SEMESTERS I TO VIII**

Every course of B. Tech. Programme shall be placed in one of the nine categories as listed in table below.

Sl. No	Category	Code	Credits
1	Humanities and Social Sciences including Management courses	HMC	5
2	Basic Science courses	BSC	26
3	Engineering Science Courses	ESC	22
4	Program Core Courses	PCC	79
5	Program Elective Courses	PEC	15
6	Open Elective Courses	OEC	3
7	Project work and Seminar	PWS	10
8	Mandatory Non-credit Courses (P/F) with grade	MNC	--
9	Mandatory Student Activities (P/F)	MSA	2
	Total Mandatory Credits		162
10	Value Added Course (Optional)	VAC	20

No semester shall have more than five lecture-based courses and two laboratory and/or drawing/seminar/project courses in the curriculum. Semester-wise credit distribution shall be as below:

Sem	1	2	3	4	5	6	7	8	Total
Credits	17	21	22	22	23	23	15	17	160
Activity Points	50				50				---
Credits for Activity	2								2
G.Total									162

Basic Science Courses: Maths, Physics, Chemistry, Biology for Engineers, Life Science etc

Engineering Science Courses: Engineering Graphics, Programming in C, Basics of Electrical and Electronics Engineering, Basics of Civil and Mechanical Engineering,

Engineering Mechanics, Thermodynamics, Design Engineering, Materials Engineering, Workshops etc.

Humanities and Social Sciences including Management courses: English, Humanities, Professional Ethics, Management, Finance & Accounting, Life Skills, Professional Communication, Economics etc

Mandatory Non-credit Courses: Environmental Science, Constitution of India/Essence of Indian Knowledge Tradition, Industrial Safety Engineering, Disaster Management etc.

Course Code and Course Number

Each course is denoted by a unique code consisting of three alphabets followed by three numerals like **CSL 201**. The first two letter code refers to the department offering the course. CS stands for course in Computer Science & Engineering, course code MA refers to a course in Mathematics, course code ES refers to a course in Engineering Science etc. Third letter stands for the nature of the course as indicated in the following table.

Code	Description
T	Theory based courses (other than lecture hours, these courses can have tutorial and practical hours, e.g., L-T-P structures 3-0-0, 3-1-2, 3-0-2 etc.)
L	Laboratory based courses (where performance is evaluated primarily on the basis of practical or laboratory work with LTP structures like 0-0-3, 1-0-3, 0-1-3 etc.)
N	Non-credit courses
D	Project based courses (Major-, Mini- Projects)
Q	Seminar courses

Course Number is a three digit number and the first digit refers to the Academic year in which the course is normally offered, i.e. 1, 2, 3, or 4 for the B. Tech. Programme of four year duration. Of the other two digits, the last digit identifies whether the course is offered normally in the odd (odd number), even (non-zero even number) or in both the semesters (zero). The middle number could be any digit. CSL 201 is a laboratory course offered in Computer Science and Engineering department for third semester, MAT 101 is a course in Mathematics offered in the first semester, EET 344 is a theory course in Electrical Engineering offered in the sixth semester, PHT 110 is a course in Physics offered both the first and second semesters, EST 102 is a course in Basic Engineering offered by one or many departments in the second semester. These course numbers are to be given in the curriculum and syllabi.

Departments

Each course is offered by a Department and their two-letter course prefix is given in Table 2.

Sl. No.	Department	Course Prefix	Sl. No.	Department	Course Prefix
1	Aeronautical Engg	AO	16	Information Technology	IT
2	Applied Electronics & Instrumentation	AE	17	Instrumentation & Control	IC
3	Automobile	AU	18	Mandatory Courses	MC
4	Biomedical Engg	BM	19	Mathematics	MA
5	Biotechnology	BT	20	Mechanical Engg	ME
6	Chemical Engg	CH	21	Mechatronics	MR
7	Chemistry	CY	22	Metallurgy	MT
8	Civil Engg	CE	23	Mechanical (Auto)	MU
9	Computer Science	CS	24	Mechanical (Prod)	MP
10	Electrical & Electronics	EE	25	Naval & Ship Building	SB
11	Electronics & Biomedical	EB	26	Physics	PH
12	Electronics & Communication	EC	27	Polymer Engg	PO
13	Food Technology	FT	28	Production Engg	PE
14	Humanities	HU	29	Robotics and Automation	RA
15	Industrial Engg	IE	30	Safety & Fire Engg	FS

SEMESTER I

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	MAT 101	LINEAR ALGEBRA AND CALCULUS	3-1-0	4	4
B 1/2	PHT 100	ENGINEERING PHYSICS A	3-1-0	4	4
	CYT 100	ENGINEERING CHEMISTRY	3-1-0	4	4
C 1/2	EST 100	ENGINEERING MECHANICS	2-1-0	3	3
	EST 110	ENGINEERING GRAPHICS	2-0-2	4	3
D 1/2	EST 120	BASICS OF CIVIL & MECHANICAL ENGINEERING	4-0-0	4	4
	EST 130	BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING	4-0-0	4	4
E	HUN 101	LIFE SKILLS	2-0-2	4	--
S 1/2	PHL 120	ENGINEERING PHYSICS LAB	0-0-2	2	1
	CYL 120	ENGINEERING CHEMISTRY LAB	0-0-2	2	1
T 1/2	ESL 120	CIVIL & MECHANICAL WORKSHOP	0-0-2	2	1
	ESL 130	ELECTRICAL & ELECTRONICS WORKSHOP	0-0-2	2	1
TOTAL				23/24	17

SEMESTER II

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	MAT 102	VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TRANSFORMS	3-1-0	4	4
B 1/2	PHT 100	ENGINEERING PHYSICS A	3-1-0	4	4
	CYT 100	ENGINEERING CHEMISTRY	3-1-0	4	4
C 1/2	EST 100	ENGINEERING MECHANICS	2-1-0	3	3
	EST 110	ENGINEERING GRAPHICS	2-0-2	4	3
D 1/2	EST 120	BASICS OF CIVIL & MECHANICAL ENGINEERING	4-0-0	4	4
	EST 130	BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING	4-0-0	4	4
E	HUT 102	PROFESSIONAL COMMUNICATION	2-0-2	4	--
F	EST 102	PROGRAMMING IN C	2-1-2	5	4
S 1/2	PHL 120	ENGINEERING PHYSICS LAB	0-0-2	2	1
	CYL 120	ENGINEERING CHEMISTRY LAB	0-0-2	2	1
T 1/2	ESL 120	CIVIL & MECHANICAL WORKSHOP	0-0-2	2	1
	ESL 130	ELECTRICAL & ELECTRONICS WORKSHOP	0-0-2	2	1
TOTAL				28/29	21

NOTE:

1. Engineering Physics A and Engineering Chemistry shall be offered in both semesters. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Engineering Physics A in S1 and Engineering Chemistry in S2 & vice versa. Students opting for Engineering Physics A in a semester should attend Physics Lab in the same semester and students opting for Engineering Chemistry in one semester should attend Engineering Chemistry Lab in the same semester.
2. Engineering Mechanics and Engineering Graphics shall be offered in both semesters. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Engineering Mechanics in S1 and Engineering Graphics in S2 & vice versa.
3. Basics of Civil & Mechanical Engineering and Basics of Electrical & Electronics Engineering shall be offered in both semesters. Basics of Civil & Mechanical Engineering contain equal weightage for Civil Engineering and Mechanical Engineering. Slot for the course is D with CIE marks of 25 each and ESE marks of 50 each. Students belonging to branches of AEI, EI, BME, ECE, EEE, ICE, CSE, IT, RA can choose this course in S1.

Basics of Electrical & Electronics Engineering contain equal weightage for Electrical Engineering and Electronics Engineering. Slot for the course is D with CIE marks of 25 each and ESE marks of 50 each. Students belonging to AERO, AUTO, CE, FSE, IE, ME, MECHATRONICS, PE, METALLURGY, BT, BCE, CHEM, FT, POLY can choose this course in S1. Students having Basics of Civil & Mechanical Engineering in one semester should attend Civil & Mechanical Workshop in the same semester and students having Basics of Electrical & Electronics Engineering in a semester should attend Electrical & Electronics Workshop in the same semester.

4. LIFE SKILLS

Life skills are those competencies that provide the means for an individual to be resourceful and positive while taking on life's vicissitudes. Development of one's personality by being aware of the self, connecting with others, reflecting on the abstract and the concrete, leading and generating change, and staying rooted in time-tested values and principles is being aimed at. This course is designed to enhance the employability and maximize the potential of the students by introducing them to the principles that underlie personal and professional success, and help them acquire the skills needed to apply these principles in their lives and careers.

5. PROFESSIONAL COMMUNICATION

Objective is to develop in the under-graduate students of engineering a level of competence in English required for independent and effective communication for their professional needs. Coverage: Listening, Barriers to listening, Steps to overcome them, Purposive listening

COMPUTER SCIENCE AND ENGINEERING

practice, Use of technology in the professional world. Speaking, Fluency & accuracy in speech, Positive thinking, Improving self-expression, Tonal variations, Group discussion practice, Reading, Speed reading practice, Use of extensive readers, Analytical and critical reading practice, Writing Professional Correspondence, Formal and informal letters, Tone in formal writing, Introduction to reports. Study Skills, Use of dictionary, thesaurus etc., Importance of contents page, cover & back pages, Bibliography, Language Lab.

SEMESTER III

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	MAT 203	DISCRETE MATHEMATICAL STRUCTURES	3-1-0	4	4
B	CST 201	DATA STRUCTURES	3-1-0	4	4
C	CST 203	LOGIC SYSTEM DESIGN	3-1-0	4	4
D	CST 205	OBJECT ORIENTED PROGRAMMING USING JAVA	3-1-0	4	4
E (1/2)	EST 200	DESIGN & ENGINEERING	2-0-0	2	2
	HUT 200	PROFESSIONAL ETHICS	2-0-0	2	2
F	MNC 201	SUSTAINABLE ENGINEERING	2-0-0	2	--
S	CSL 201	DATA STRUCTURES LAB	0-0-3	3	2
T	CSL 203	OBJECT ORIENTED PROGRAMMING LAB (IN JAVA)	0-0-3	3	2
R/M	VAC	Remedial/Minor course	3-1-0	4	4
TOTAL				26*	22/26
* Excluding Hours to be engaged for Remedial/Minor course.					

SEMESTER IV

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	MAT 206	GRAPH THEORY	3-1-0	4	4
B	CST 202	C O M P U T E R ORGANIS ATION AND ARCHITECTURE	3-1-0	4	4
C	CST 204	DATABASE MANAGEMENT SYSTEMS	3-1-0	4	4
D	CST 206	OPERATING SYSTEMS	3-1-0	4	4
E (1/2)	EST 200	DESIGN & ENGINEERING	2-0-0	2	2
	HUT 200	PROFESSIONAL ETHICS	2-0-0	2	2
F	MNC 202	CONSTITUTION OF INDIA	2-0-0	2	--
S	CSL 202	DIGITAL LAB	0-0-3	3	2
T	CSL204	OPERATING SYSTEMS LAB	0-0-3	3	2
R/M/ H	VAC	Remedial/Minor/Honors course	3-1-0	4	4
TOTAL				26*	22/26
* Excluding Hours to be engaged for Remedial/Minor/Honors course.					

NOTE:

- Design & Engineering and Professional Ethics shall be offered in both S3 and S4. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Design & Engineering in S3 and Professional Ethics in S4 & vice versa.
- *All Institutions should keep 4 hours exclusively for Remedial class/Minor course (Thursdays from 3 to 5 PM and Fridays from 2 to 4 PM). If a student does not opt for minor programme, he/she can be given remedial class.

SEMESTER V

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	CST 301	FORMAL LANGUAGES AND AUTOMATA THEORY	3-1-0	4	4
B	CST 303	COMPUTER NETWORKS	3-1-0	4	4
C	CST 305	SYSTEM SOFTWARE	3-1-0	4	4
D	CST 307	MICROPROCESSORS AND MICROCONTROLLERS	3-1-0	4	4
E	CST 309	MANAGEMENT OF SOFTWARE SYSTEMS	3-0-0	3	3
F	MNC 301	DISASTER MANAGEMENT	2-0-0	2	--
S	CSL 331	SYSTEM SOFTWARE AND MICROPROCESSORS LAB	0-0-4	4	2
T	CSL 333	DATABASE MANAGEMENT SYSTEMS LAB	0-0-4	4	2
R/M/H	VAC	Remedial/Minor/Honors course*	2-0-0	4	4
TOTAL				29*	23/27
* Excluding Hours to be engaged for Remedial/Minor/Honors course.					

NOTE:

- *All Institutions should keep 4 hours exclusively for Remedial class/Minor/ Honors course (Tuesdays from 3 to 5 PM and Wednesdays from 3 to 5 PM). If a student does not opt for minor/honors programme, he/she can be given remedial class.

SEMESTER VI

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	CST 302	COMPILER DESIGN	3-1-0	4	4
B	CST 304	COMPUTER GRAPHICS AND IMAGE PROCESSING	3-1-0	4	4
C	CST 306	ALGORITHM ANALYSIS AND DESIGN	3-1-0	4	4
D	CST ---	PROGRAM ELECTIVE I	2-1-0	3	3
E	HUT 300	INDUSTRIAL ECONOMICS & FOREIGN TRADE	3-0-0	3	3
F	CST 308	COMPREHENSIVE COURSE WORK	1-0-0	1	1
S	CSL 332	NETWORKING LAB	0-0-3	3	2
T	CSD 334	MINIPROJECT	0-0-3	3	2
R/M/H	VAC	Remedial/Minor/Honors course*	3-1-0	4	4
TOTAL				25*	23/27
* Excluding Hours to be engaged for Remedial/Minor/Honors course.					

Note:

Electives: This curriculum envisages to offer a learner an opportunity to earn proficiency in one of the five trending areas in Computer Science, namely Machine Learning, Data Science, Security in Computing, Formal Methods in Software Engineering and Hardware Technologies. Three courses each from the above areas are included through Elective Courses in different Elective Buckets. For example, a learner who is interested in the *Machine Learning* area may opt to take the elective courses - *Foundations of Machine Learning* from Elective-I in S6, *Machine Learning* from Elective-II in S7 and *Deep Learning* from Elective-III in S8. The Department may offer Elective Courses to enable students to utilize this opportunity, depending on the availability of faculty. The courses included from these areas under various Elective Buckets are shown in the table below.

Different Specializations introduced through various Elective Buckets				
Bucket	Specialisation	Semester		
		S6	S7	S8
1	Machine Learning	FOUNDATIONS OF MACHINE LEARNING (E-I)	MACHINE LEARNING (E-II)	DEEP LEARNING (E-III)
2	Data Science	DATA ANALYTICS (E-I)	CLOUD COMPUTING (E-II)	BLOCK CHAIN TECHNOLOGIES (E-V)
3	Security in Computing	FOUNDATIONS OF SECURITY IN COMPUTING (E-I)	SECURITY IN COMPUTING (E-II)	CRYPTOGRAPHY (E-III)
4	Formal Methods in Software Engineering	AUTOMATED VERIFICATION (E-I)	MODEL BASED SOFTWARE DEVELOPMENT (E-II)	SOFTWARE TESTING (E-V)
5	Hardware Technologies	INTRODUCTION TO IA32 ARCHITECTURE (E-I)	ADVANCED TOPICS IN IA32 ARCHITECTURE (E-II)	UNIFIED EXTENDED FIRMWARE INTERFACE (E-IV)

PROGRAM ELECTIVE I

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
D	CST 312	i FOUNDATIONS OF MACHINE LEARNING	2-1-0	3	3
	CST 322	ii DATA ANALYTICS	2-1-0		
	CST 332	iii FOUNDATIONS OF SECURITY IN COMPUTING	2-1-0		
	CST 342	iv AUTOMATED VERIFICATION	2-1-0		
	CST 352	v INTRODUCTION TO IA32 ARCHITECTURE	2-1-0		
	CST 362	vi PROGRAMMING IN PYTHON	2-1-0		
	CST 372	vii DATA AND COMPUTER COMMUNICATION	2-1-0		

COURSES TO BE CONSIDERED FOR COMPREHENSIVE COURSE WORK

i DISCRETE MATHEMATICAL STRUCTURES
ii DATA STRUCTURES
iii OPERATING SYSTEMS
iv COMPUTER ORGANIZATION AND ARCHITECTURE
v DATABASE MANAGEMENT SYSTEMS
vi FORMAL LANGUAGES AND AUTOMATA THEORY

NOTE:

1. *All Institutions should keep 4 hours exclusively for Remedial class/Minor/Honors course (Tuesdays from 3 to 5 PM and Wednesdays from 2 to 4 PM). If a student does not opt for minor/honors programme, he/she can be given remedial class.
2. Comprehensive Course Work: The comprehensive course work in the sixth semester of study shall have a written test of 50 marks. The written examination will be of objective type similar to the GATE examination and will be conducted by the University. Syllabus for comprehensive examination shall be prepared by the respective BoS choosing the above listed 6 core courses studied from semesters 3 to 5. The pass minimum for this course is 25. The course should be mapped with a faculty and classes shall be arranged for practicing questions based on the core courses listed in the curriculum.
3. Mini project: It is introduced in the sixth semester with a specific objective to strengthen the understanding of student's fundamentals through effective application of theoretical concepts. Mini project can help to boost their skills and widen the horizon of their thinking. The ultimate aim of an engineering student is to resolve a problem by applying theoretical knowledge. Doing more projects increases problem-solving skills. Student Groups with 3 or 4 members should identify a topic of interest in consultation with Faculty/Advisor. Review the literature and gather information pertaining to the chosen topic. State the objectives and develop a methodology to achieve the objectives. Carryout the design/fabrication or develop codes/programs to achieve the objectives. Demonstrate the novelty of the project through the results and outputs. The progress of the mini project is evaluated based on a minimum of two reviews. The review committee may be constituted by the Head of the Department. A project report is required at the end of the semester. The product has to be

demonstrated for its full design specifications. Innovative design concepts, reliability considerations, aesthetics/ergonomic aspects taken care of in the project shall be given due weight. The internal evaluation will be made based on the product, the report and a viva-voce examination, conducted internally by a 3 member committee appointed by Head of the Department comprising HoD or a senior faculty member, Mini Project coordinator for that program and project guide.

Total marks: 150 - CIE 75 marks and ESE 75 marks

Split up for CIE

Attendance 10

Project Guide 15

Project Report 10

Evaluation by the Committee (will be evaluating the level of completion and demonstration of functionality/specifications, presentation, oral examination, work knowledge and involvement) 40

SEMESTER VII

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	CST 401	ARTIFICIAL INTELLIGENCE	2-1-0	3	3
B	CST ---	PROGRAM ELECTIVE II	2-1-0	3	3
C	CST ---	OPEN ELECTIVE	2-1-0	3	3
D	MNC 401	INDUSTRIAL SAFETY ENGINEERING	2-1-0	3	---
S	CSL 411	COMPILER LAB	0-0-3	3	2
T	CSQ 413	SEMINAR	0-0-3	3	2
U	CSD 415	PROJECT PHASE I	0-0-6	6	2
R/M/H	VAC	Remedial/Minor/Honors course*	3-1-0	4	4
TOTAL				24*	15/19
* Excluding Hours to be engaged for Remedial/Minor/Honors course.					

PROGRAM ELECTIVE II

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
B	CST 413	i MACHINE LEARNING	2-1-0	3	3
	CST 423	ii CLOUD COMPUTING	2-1-0		
	CST 433	iii SECURITY IN COMPUTING	2-1-0		
	CST 443	iv MODEL BASED SOFTWARE DEVELOPMENT	2-1-0		
	CST 453	v ADVANCED TOPICS IN IA32 ARCHITECTURE	2-1-0		
	CST 463	vi WEB PROGRAMMING	2-1-0		
	CST 473	vii NATURAL LANGUAGE PROCESSING	2-1-0		

OPEN ELECTIVE

The open elective is offered in semester 7. Each program should specify the courses (maximum 5) they would like to offer as electives for other programs. The courses listed below are offered by the Department of **COMPUTER SCIENCE & ENGINEERING** for students of other undergraduate branches except Computer Science & Engineering and Information Technology, offered in the colleges under KTU.

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
B	CST 415	i INTRODUCTION TO MOBILE COMPUTING	2-1-0	3	3
	CST 425	ii INTRODUCTION TO DEEP LEARNING	2-1-0		
	CST 435	iii COMPUTER GRAPHICS	2-1-0		
	CST 445	iv PYTHON FOR ENGINEERS	2-1-0		
	CST 455	v OBJECT ORIENTED CONCEPTS	2-1-0		

NOTE:

1. All Institutions should keep 4 hours exclusively for Remedial class/Minor/Honors course (Mondays from 10 to 12 and Wednesdays from 10 to 12 Noon). If a student does not opt for minor/honors programme, he/she can be given remedial class.
2. Seminar: To encourage and motivate the students to read and collect recent and reliable information about their area of interest confined to the relevant discipline, from technical publications including peer reviewed journals, conferences, books, project reports etc., prepare a report based on a central theme and present it before a peer audience. Each student shall present the seminar for about 20 minutes duration on the selected topic. The report and the presentation shall be evaluated by a team of faculty members comprising Academic coordinator for that program, seminar coordinator and seminar guide based on style of presentation, technical content, adequacy of references, depth of knowledge and overall quality of the report.

Total marks: 100, only CIE, minimum required to pass 50

Attendance	10
Seminar Guide	20
Technical Content of the Report	30
Presentation	40

3. Project Phase-I: A Project topic must be selected either from research literature or the students themselves may propose suitable topics in consultation with their guides. The objective of Project Work Phase-I is to enable the student to take up investigative study in the broad field of Computer Science and Engineering, either fully theoretical/practical or involving both theoretical and practical work to be assigned by the Department on a group of three/four students, under the mentoring of a Project Guide(s). This is expected to provide a good initiation for the student(s) in R&D work. The assignment shall normally include:
 - Survey and study of published literature on the assigned topic;
 - Preparing an Action Plan for conducting the investigation, including team work;
 - Working out a preliminary Approach to the Problem relating to the assigned topic;
 - Block level design documentation
 - Conducting preliminary Analysis/ Modelling/ Simulation/ Experiment/ Design/ Feasibility;

- Preparing a Written Report on the Study conducted for presentation to the Department;
- Final project presentation before the concerned departmental committee.

Total marks: 100, only CIE, minimum required to pass 50

Project Guide(s) 30

Interim evaluation by the evaluation committee 20

Final project presentation 30

Final evaluation by the evaluation committee 20

The evaluation committee comprises HoD or a senior faculty member, Project coordinator and project guide(s).

SEMESTER VIII

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	CST 402	DISTRIBUTED COMPUTING	2-1-0	3	3
B	CST ---	PROGRAM ELECTIVE III	2-1-0	3	3
C	CST ---	PROGRAM ELECTIVE IV	2-1-0	3	3
D	CST ---	PROGRAM ELECTIVE V	2-1-0	3	3
T	CST 404	COMPREHENSIVE COURSE VIVA	1-0-0	1	1
U	CSD 416	PROJECT PHASE II	0-0-12	12	4
R/M/H	VAC	Remedial/Minor/Honors course	3-1-0	4	4
TOTAL				25*	17/21
* Excluding Hours to be engaged for Remedial/Minor/Honors course.					

PROGRAM ELECTIVE III

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
B	CST 414	i DEEP LEARNING	2-1-0	3	3
	CST 424	ii PROGRAMMING PARADIGMS	2-1-0		
	CST 434	iii CRYPTOGRAPHY	2-1-0		
	CST 444	iv SOFT COMPUTING	2-1-0		
	CST 454	v FUZZY SET THEORY AND APPLICATIONS	2-1-0		
	CST 464	vi EMBEDDED SYSTEMS	2-1-0		
	CST 474	vii COMPUTER VISION	2-1-0		

PROGRAM ELECTIVE IV

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
C	CST 416	i FORMAL METHODS AND TOOLS IN SOFTWARE ENGINEERING	2-1-0	3	3
	CST 426	ii CLIENT SERVER ARCHITECTURE	2-1-0		
	CST 436	iii PARALLEL COMPUTING	2-1-0		
	CST 446	iv DATA COMPRESSION TECHNIQUES	2-1-0		
	CST 456	v UNIFIED EXTENDED FIRMWARE INTERFACE	2-1-0		
	CST 466	vi DATA MINING	2-1-0		
	CST 476	vii MOBILE COMPUTING	2-1-0		

PROGRAM ELECTIVE V

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
D	CST 418	i HIGH PERFORMANCE COMPUTING	2-1-0	3	3
	CST 428	ii BLOCK CHAIN TECHNOLOGIES	2-1-0		
	CST 438	iii IMAGE PROCESSING TECHNIQUE	2-1-0		
	CST 448	iv INTERNET OF THINGS	2-1-0		
	CST 458	v SOFTWARE TESTING	2-1-0		
	CST 468	vi BIOINFORMATICS	2-1-0		
	CST 478	vii COMPUTATIONAL LINGUISTICS	2-1-0		

NOTE:

1. *All Institutions should keep 4 hours exclusively for Remedial class/Minor/Honors course (Mondays from 10 to 12 and Wednesdays from 10 to 12 PM). If a student does not opt for minor/honors programme, he/she can be given remedial class.
2. **Comprehensive Viva Voce:** The comprehensive viva voce in the eighth semester of study shall have a viva voce for 50 marks. The viva voce shall be conducted based on the core subjects studied from third to eighth semester. The viva voce will be conducted by the same three member committee assigned for final project phase II evaluation towards the end of the semesters. The pass minimum for this course is 25. The course should be mapped with a faculty and classes shall be arranged for practicing questions based on the core courses listed in the curriculum. The mark will be treated as internal and should be uploaded along with internal marks of other courses.
3. **Project Phase II:** The objective of Project Work Phase II & Dissertation is to enable the student to extend further the investigative study taken up in Project Phase I, either fully theoretical/practical or involving both theoretical and practical work, under the mentoring of a Project Guide from the Department alone or jointly with a Supervisor drawn from R&D laboratory/Industry. This is expected to provide a good training for the student(s) in R&D work and technical leadership. The assignment shall normally include:

- In depth study of the topic assigned in the light of the Report prepared in Phase I;
- Review and finalization of the Approach to the Problem relating to the assigned topic;
- Detailed Analysis/Modeling/Simulation/Design/Problem Solving/Experiment as needed;
- Final development of product/process, testing, results, conclusions and future directions;
- Preparing a paper for Conference presentation/Publication in Journals, if possible;
- Preparing a Dissertation in the standard format for being evaluated by the Department;
- Final Presentation before the concerned evaluation committee

Total marks: 150, only CIE, minimum required to pass 75

Project Guide	30
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Interim evaluation, twice in the semester by the evaluation committee	70
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Quality of the report evaluated by the above committee	10
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(The evaluation committee comprises HoD or a senior faculty member, Project coordinator and project guide).

Final evaluation by a three member committee	40
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(The final evaluation committee comprises Project coordinator, expert from Industry/ research Institute and a senior faculty from a sister department. The same committee will conduct comprehensive course viva for 50 marks).

MINOR

Minor is an additional credential a student may earn if she/he does 20 credits worth of additional learning in a discipline other than her/his major discipline of B.Tech. degree. The objective is to permit a student to customize their Engineering degree to suit their specific interests. Upon completion of an Engineering Minor, a student will be better equipped to perform interdisciplinary research and will be better employable. Engineering Minors allow a student to gain interdisciplinary experience and exposure to concepts and perspectives that may not be a part of their major degree programs.

The academic units offering minors in their discipline will prescribe the set of courses and/or other activities like projects necessary for earning a minor in that discipline. A specialist bucket of 3-6 courses is identified for each Minor. Each bucket may rest on one or more

foundation courses. A bucket may have sequences within it, i.e., advanced courses may rest on basic courses in the bucket. She/he accumulates credits by registering for the required courses, and if the requirements for a particular minor are met within the time limit for the course, the minor will be awarded. This will be mentioned in the Degree Certificate as “Bachelor of Technology in xxx with Minor in yyy”. The fact will also be reflected in the consolidated grade card, along with the list of courses taken. If one specified course cannot be earned during the course of the programme, that minor will not be awarded. The individual course credits earned, however, will be reflected in the consolidated grade card.

(i) The curriculum/syllabus committee/BoS shall prepare syllabus for courses to be included in the curriculum from third to eight semesters for all branches. The minor courses shall be identified by M slot courses.

(ii) Registration is permitted for Minor at the beginning of third semester. Total credits required to award B.tech with Minor is 182 (162 + 20)

(iii) Out of the 20 Credits, 12 credits shall be earned by undergoing a minimum of three courses, of which one course shall be a mini project based on the chosen area. They can do miniproject either in S7 or in S8. The remaining 8 credits could be acquired through 2 MOOCs recommended by the Board of Studies and approved by the Academic Council or 2 courses from the minor buckets listed here. The classes for Minor shall be conducted along with regular classes and no extra time shall be required for conducting the courses.

(iv) There won't be any supplementary examination for the courses chosen for Minor.

(v) On completion of the program, “Bachelor of Technology in xxx with Minor in yyy” will be awarded if the registrant earn 20 credits from the minor courses.

(vi) The registration for minor program will commence from semester 3 and all the academic units offering minors in their discipline should prescribe set of such courses. The courses shall be grouped into maximum of 5 buckets. The bucket of courses may have sequences within it, i.e., advanced courses may rest on basic courses in the bucket. Reshuffling of courses between various buckets will not be allowed. There is option to skip any two courses listed here and to opt for equivalent MOOC courses approved by the Academic Council. In any case, they should carry out a mini project based on the chosen area in S7 or S8. For example: Students who have registered for **B.Tech Minor in Computer Science & Engineering** can opt to study the courses listed below:

MINOR BUCKETS												
S E M E S T E R	BUCKET-1				BUCKET-2				BUCKET-3			
	Specialization - Software Engineering				Specialization - Machine Learning				Specialization - Networking			
	COURSE NO	COURSE NAME	HOURS	CREDITS	COURSE NO	COURSE NAME	HOURS	CREDITS	COURSE NO	COURSE NAME	HOURS	CREDITS
S3	CST 281	OBJECT ORIENTED PROGRAMMING	4	4	CST 283	PYTHON FOR MACHINE LEARNING	4	4	CST 285	DATA COMMUNICATION	4	4
S4	CST 282	PROGRAMMING METHODOLOGIES	4	4	CST 284	MATHEMATICS FOR MACHINE LEARNING	4	4	CST 286	INTRODUCTION TO COMPUTER NETWORKS	4	4
S5	CST 381	CONCEPTS IN SOFTWARE ENGINEERING	4	4	CST 383	CONCEPTS IN MACHINE LEARNING	4	4	CST 385	CLIENT SERVER SYSTEMS	4	4
S6	CST 382	INTRODUCTION TO SOFTWARE TESTING	4	4	CST 384	CONCEPTS IN DEEP LEARNING	4	4	CST 386	WIRELESS NETWORKS AND IOT APPLICATIONS	4	4
S7	CSD 481	Miniproject	4	4	CSD 481	Miniproject	4	4	CSD 481	Miniproject	4	4
S8	CSD 482	Miniproject	4	4	CSD 482	Miniproject	4	4	CSD 482	Miniproject	4	4
Note-1: Name of the specialization shall be mentioned in the Minor Degree to be awarded												
Note-2: Any B.Tech students from non-Computer Science/non-IT streams can register for the courses in the minor buckets.												

HONORS

Honors is an additional credential a student may earn if she/he opts for the extra 20 credits needed for this in her/his own discipline. Honors is not indicative of a class. The University is providing this option for academically extra brilliant students to acquire Honors. Honors is intended for a student to *gain expertise/get specialized* in an area inside his/her major B.Tech discipline and to enrich knowledge in emerging/advanced areas in the concerned branch of engineering. It is particularly suited for students aiming to pursue higher studies. Upon completion of Honors, a student will be better equipped to perform research in her/his branch of engineering. On successful accumulation of credits at the end of the programme, this will be mentioned in the Degree Certificate as “Bachelor of Technology in xxx, with Honors.” The fact will also be reflected in the consolidated grade card, along with the list of courses taken. If a student is not earning credits for any one of the specified course for getting Honors, she/he is not entitled to get Honors. The individual course credits earned, however, will be reflected in the consolidated grade card.

The courses shall be grouped into maximum of 3 buckets, each bucket representing a particular specialization in the branch. The students shall select only the courses from same bucket in all semesters. It means that the specialization is to be fixed by the student and cannot be changed subsequently. The internal evaluation, examination and grading shall be exactly as for other mandatory courses. The Honors courses shall be identified by H slot courses.

- (i) The curriculum/syllabus committee/BoS shall prepare syllabus for courses to be included in the curriculum from fourth to eight semesters for all branches. The Honors courses shall be identified by H slot courses.
- (ii) Registration is permitted for Honors at the beginning of fourth semester. Total credits required is 182 (162 + 20).
- (iii) Out of the 20 Credits, 12 credits shall be earned by undergoing a minimum of three courses, of which one course shall be a mini project based on the chosen area. The remaining 8 credits could be acquired through 2 MOOCs recommended by the Board of studies and approved by the Academic Council or 2 courses from the same bucket as the above 3 courses. The classes for Honors shall be conducted along with regular classes and no extra time shall be required for conducting the courses. The students should earn a grade of ‘C’ or better for all courses under Honors.
- (iv) There won’t be any supplementary examination for the courses chosen for Honors.
- (v) On successful accumulation of credits at the end of the programme, “Bachelor of Technology in xxx, with Honors” will be awarded if overall CGPA is greater than

or equal to 8.5, earned a grade of 'C' or better for all courses chosen for Honors and there is no history of 'F' Grade in the entire span of the BTech Course.

- (vi) The registration for Honors program will commence from semester 4 and the all academic units offering Honors in their discipline should prescribe set of such courses. The courses shall be grouped into maximum of 5 buckets, each bucket representing a particular specialization in the branch. The students shall select only the courses from same bucket in all semesters. It means that the specialization is to be fixed by the student and cannot be changed subsequently. There is option to skip any two courses listed here if required, and to opt for equivalent MOOC courses approved by the Academic Council. In any case, they should carry out a mini project based on the chosen area in S8. For example: Students who have registered for **B.Tech in Computer Science and Engineering with Honors** can opt to study the courses listed in one of the buckets shown below:



HONORS BUCKETS												
S E M E S T E R	BUCKET-1				BUCKET-2				BUCKET-3			
	Specialization - Security in Computing				Specialization - Machine Learning				Specialization - Formal Methods			
	COURSE NO	COURSE NAME	HOURS	CREDIT	COURSE NO	COURSE NAME	HOURS	CREDIT	COURSE NO	COURSE NAME	HOURS	CREDIT
S4	CST 292	NUMBER THEORY	4	4	CST 294	COMPUTATIONAL FUNDAMENTALS FOR MACHINE LEARNING	4	4	CST 296	PRINCIPLES OF PROGRAM ANALYSIS AND VERIFICATION	4	4
S5	CST 393	CRYPTOGRAPHIC ALGORITHMS	4	4	CST 395	NEURAL NETWORKS AND DEEP LEARNING	4	4	CST 397	PRINCIPLES OF MODEL CHECKING	4	4
S6	CST 394	NETWORK SECURITY	4	4	CST 396	ADVANCED TOPICS IN MACHINE LEARNING	4	4	CST 398	THEORY OF COMPUTABILITY AND COMPLEXITY	4	4
S7	CST 495	CYBER FORENSICS	4	4	CST 497	ADVANCED TOPICS IN ARTIFICIAL INTELLIGENCE	4	4	CST 499	LOGIC FOR COMPUTER SCIENCE	4	4
S8	CSD 496	Miniproject	4	4	CSD 496	Miniproject	4	4	CSD 496	Miniproject	4	4
Note: Name of the specialization shall be mentioned in the Honors Degree to be awarded												

INDUCTION PROGRAM

There will be three weeks induction program for first semester students. It is a unique three-week immersion Foundation Programme designed specifically for the fresher's which includes a wide range of activities right from workshops, lectures and seminars to sports tournaments, social works and much more. The programme is designed to mould students into well-rounded individuals, aware and sensitized to local and global conditions and foster their creativity, inculcate values and ethics, and help students to discover their passion. Foundation Programme also serves as a platform for the fresher's to interact with their batch-mates and seniors and start working as a team with them. The program is structured around the following five themes:

The programme is designed keeping in mind the following objectives:

- **Values and Ethics:** Focus on fostering a strong sense of ethical judgment and moral fortitude.
- **Creativity:** Provide channels to exhibit and develop individual creativity by expressing themselves through art, craft, music, singing, media, dramatics, and other creative activities.
- **Leadership, Communication and Teamwork:** Develop a culture of teamwork and group communication.
- **Social Awareness:** Nurture a deeper understanding of the local and global world and our place in it as concerned citizens of the world.
- **Physical Activities & Sports:** Engage students in sports and physical activity to ensure healthy physical and mental growth.

MAHATMA GANDHI UNIVERSITY



SCHEME AND SYLLABI
FOR
M.TECH DEGREE PROGRAMME
IN
COMPUTER SCIENCE AND ENGINEERING
WITH SPECIALIZATION IN
COMPUTER SCIENCE AND ENGINEERING
(2013 ADMISSION ONWARDS)

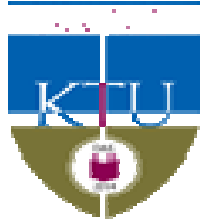
SEMESTER III

Sl. No.	Course No.	Subject	Hrs / Week			Evaluation Scheme (Marks)					Credits (C)
			L	T	P	Sessional			ESE	Total	
						TA	CT	Sub Total			
1	MCPRM 301	Research Methodology	4	0	0	25	25	50	100	150	4
2	MCSCS 302	Big Data Processing	4	0	0	25	25	50	100	150	4
3	MCSCS 303	Mini Project or Industrial Training	0	0	16	25	25	50	100	150	7
		Master's Thesis Phase - I	0	0	3	25	0	25	25	50	
					1						

SEMESTER IV

Sl. No.	Course No.	Subject	Hrs / Week			Evaluation Scheme (Marks)					Credits (C)
			L	T	P	Sessional			ESE	Total	
						TA	CT	Sub Total			
1	MCSCS 401	Master's Thesis	0	0	27	100	0	100	100	200	12
2	MCSCS 402	Master's Comprehensive Viva	0	0	0	0	0	0	100	100	3
Total										300	15
Grand Total of four Semesters									3000	80	

KERALA TECHNOLOGICAL UNIVERSITY



SCHEME AND SYLLABUS

FOR

M. Tech. DEGREE PROGRAMME

IN

COMPUTER SCIENCE AND ENGINEERING

WITH SPECIALIZATION

COMPUTER SCIENCE AND ENGINEERING

CLUSTER 05 (ERNAKULAM II)

KERALA TECHNOLOGICAL UNIVERSITY

CET Campus, Thiruvananthapuram

Kerala, India -695016

(2015 ADMISSION ONWARDS)

KERALA TECHNOLOGICAL UNIVERSITY

SCHEME AND SYLLABUS FOR M. Tech. DEGREE PROGRAMME

Branch: COMPUTER SCIENCE AND ENGINEERING

Specialization: COMPUTER SCIENCE AND ENGINEERING

SEMESTER I

<i>Exam Slot</i>	<i>Course No</i>	<i>Subjects</i>	L-T-P	Internal Marks	End Semester Exam		Credits
					Marks	Duration (hrs)	
A	05CS 6001	Computational Intelligence	3-1-0	40	60	3	4
B	05CS 6003	Advanced Data Structures and Algorithms	3-1-0	40	60	3	4
C	05CS 6005	Data Mining and Warehousing	3-1-0	40	60	3	4
D	05CS 6007	Object Oriented Software Engineering	2-1-0	40	60	3	3
E	05CS 601x	Elective I	2-1-0	40	60	3	3
	05CS 6077	Research Methodology	1-1-0	100	0	0	2
	05CS 6091	CASE Lab	0-0-2	100	0	0	1

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Elective – I	
Course No	Subjects
05CS 6011	Web Security
05CS 6013	Digital Image processing
05CS 6015	Natural Language Processing

SEMESTER – II

<i>Exam Slot</i>	<i>Course No</i>	<i>Subjects</i>	<i>L-T-P</i>	<i>Internal Marks</i>	<i>End Semester Exam</i>		<i>Credits</i>
					Marks	Duration (hrs)	
A	05CS 6002	Modern Databases	3-1-0	40	60	3	4
B	05CS 6004	Advanced Computer Networks	2-1-0	40	60	3	3
C	05CS 6006	Operating System Design Concepts	2-1-0	40	60	3	3
D	05CS 602x	Elective II	2-1-0	40	60	3	3
E	05CS 603x	Elective III	2-1-0	40	60	3	3
	05CS 6066	Seminar I	0-0-2	100	0	0	2
	05CS 6088	Mini project	0-0-4	100	0	0	2
	05CS 6092	Network Systems Lab	0-0-2	100	0	0	1

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Elective – II	
Course No	Subjects
05CS 6022	Real Time Systems
05CS 6024	Bio Computing
05CS 6026	Advanced Computer Architecture

Elective – III	
Course No	Subjects
05CS 6032	Social Network Analytics
05CS 6034	Embedded Systems
05CS 6036	Cyber Forensics

SEMESTER – III

<i>Exam Slot</i>	<i>Course No</i>	<i>Subjects</i>	<i>L-T-P</i>	<i>Internal Marks</i>	<i>End Semester Exam</i>		<i>Credits</i>
					Marks	Duration(hrs)	
A	05CS 704x	Elective IV	2-1-0	40	60	3	3
B	05CS 705x	Elective V	2-1-0	40	60	3	3
	05CS 7067	Seminar II	0-0-2	100	0	0	2
	05CS 7087	Project (Phase1)	0-0-8	50	0	0	6

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Elective – IV	
Course No	Subjects
05CS 7041	Big data Processing
05CS 7043	Cloud Computing
05CS 7045	Ontological Engineering

Elective – V	
Course No	Subjects
05CS 7051	Web Services
05CS 7053	Information Retrieval
05CS 7055	Distributed Algorithms

SEMESTER – IV

<i>Exam Slot</i>	<i>Course No</i>	<i>Subjects</i>	<i>L-T-P</i>	<i>Internal Marks</i>	<i>End Semester Exam</i>		<i>Credits</i>
					Marks	Duration(hrs)	
	05CS 7088	Project (Phase 2)	0-0-21	70	30	-	12

12

Total 68



VISWAJYOTHI COLLEGE OF ENGINEERING & TECHNOLOGY

(Approved by AICTE, Affiliated to APJ Abdul Kalam Technological University, Kerala)

Vazhakulam P.O., Muvattupuzha, Ernakulam Dist., Kerala, India - 686 670

Ph: 0485 2262211, 2262244, 2262255, 2262977, Fax : 0485 2262211

Web : www.vjcet.ac.in E-mail : vjcet@vjcet.org, vjcvklm@gmail.com



All B.Tech Programmes (CE, CSE, ECE, EEE, IT & ME) Accredited by NBA

Date : 28/04/2021

Self Declaration

Subject: Reference to metric number 1.3.2. Experiential learning courses in the curriculum apart from Project work/ Internship/ field work

In Electronics and Communication Engineering, for undergraduate programme, semesters from 1 to 6 consists of 8 courses out of which 2 are laboratory courses and semester 7 consists of 1 laboratory course as per APJ Abdul Kalam Technological University in addition to project work/Internships/Field work. In MG university, for undergraduate programme ,semesters from 1 to 7 consists of '8 courses out of which 2 are laboratory courses and semester 8 consists of 1 laboratory course. In Mtech in VLSI and Embedded systems, semesters 1 and 2 consists of 1 laboratory course as per APJ Abdul Kalam Technological University. In laboratory courses, students undergo experiential learning related to one or more theory courses. Thus each student goes through more than 30% of experiential learning in each semester.



Dr. K.K. Rajan
Principal

Viswajyothi College of Engineering & Technology
Vazhakulam P.O., Muvattupuzha, Kerala-686 670

Note: Sample copy of scheme and syllabus is enclosed along with this letter.

Mahatma Gandhi University Revised Scheme For
B Tech Syllabus Revision 2010 (Electronics & Communication
Engineering)
Common for All Branches
SCHEME S1&S2

Code	Subject	Hours/week			Marks		End-sem duration- hours	Credits
		L	T	P/D	Internal	End-sem		
EN010 101	Engineering Mathematics I	2	1	-	50	100	3	5
EN010 102	Engineering Physics	1	1	-	50	100	3	4
EN010 103	Engineering. Chemistry & Environmental Studies	1	1	-	50	100	3	4
EN010 104	Engineering Mechanics	3	1	-	50	100	3	6
EN010 105	Engineering Graphics	1	3	-	50	100	3	6
EN010 106	Basic Civil Engineering	1	1	-	50	100	3	4
EN010 107	Basic Mechanical Engineering	1	1	-	50	100	3	4
EN010 108	Basic Electrical Engineering	1	1	-	50	100	3	4
EN010 109	Basic Electronics Engineering. & Information Technology	2	1	-	50	100	3	5
EN010 110	Mechanical Workshop	0	-	3	50	-	3	1
EN010 111	Electrical and Civil Workshops	-	-	3	100	-	3	1
	Total	13	11	6			30	44

3rd Semester

Code	Subject	Hours/week			Marks		End-sem duration- hours	Credits
		L	T	P/D	Internal	End-sem		
EN010 301A	Engineering Mathematics II	2	2	-	50	100	3	4
EN010 302	Economics and Communication Skills	2	2	-	50	100	3	4 (3+1)
EC010 303	Network Theory	2	2	-	50	100	3	4
EC010 304	Solid State Devices	3	1	-	50	100	3	4
EC010 305	Analog Circuits - I	3	1	-	50	100	3	4
EC010 306	Computer Programming	3	1	-	50	100	3	4
EC010 307	Analog Circuits Lab	-	-	3	50	100	3	2
EC010 308	Programming Lab	-	-	3	50	100	3	2
	Total	15	9	6				28

4th Semester

Code	Subject	Hours/week			Marks		End-sem duration- hours	Credits
		L	T	P/D	Internal	End-sem		
EN010 401	Engineering Mathematics III	2	2	-	50	100	3	4
EN010 402(ME)	Principles of Management(C,M,P,L,A,T)	3	1	-	50	100	3	4
EC010 403	Signals and Systems	2	2	-	50	100	3	4
EC010 404	Digital Electronics	3	1	-	50	100	3	4
EC010 405	Analog Communication	3	1	-	50	100	3	4
EC010 406	Analog Circuits -II	3	1	-	50	100	3	4
EC010 407	Analog Circuits -II Lab	-	-	3	50	100	3	2
EC010 408	Analog Communication Lab	-	-	3	50	100	3	2
	Total	16	8	6				28

5th Semester

Code	Subject	Hours/week			Marks		End-sem duration- hours	Credits
		L	T	P/D	Internal	End-sem		
EN010 501A	Engineering Mathematics IV	2	2	-	50	100	3	4
EC010 502	Control Systems	2	2		50	100	3	4
EC010 503	Digital System Design	3	1	-	50	100	3	4
EC010 504(E.E)	Electrical Drives and Control	3	1	-	50	100	3	4
EC010 505	Applied Electromagnetic Theory	3	1	-	50	100	3	4
EC010 506	Microprocessors and Applications	3	1	-	50	100	3	4
EC010 507	Digital Electronics Lab	-	-	3	50	100	3	2
EC010 508(E.E)	Electrical Drives and Control Lab	-	-	3	50	100	3	2
	Total	16	8	6				28

6th Semester

Code	Subject	Hours/week			Marks		End-sem duration hours	Credits
		L	T	P/D	Internal	End-sem		
EC010 601	Digital Communication Techniques	2	2	-	50	100	3	4
EC010 602	Digital Signal Processing	2	2	-	50	100	3	4
EC010 603	Radiation and Propagation	3	1	-	50	100	3	4
EC010 604	Computer Architecture and Parallel Processing	3	1	-	50	100	3	4
EC010 605	Microcontrollers and Applications	3	1	-	50	100	3	4
EC010 606Lxx	Elective I	3	1	-	50	100	3	4
EC010 607	Microprocessor and Microcontroller Lab	-	-	3	50	100	3	2
EC010 608	Mini Project Lab	-	-	3	50	100	3	2
	Total	16	8	6				28

Elective I

EC010 606L01 – Data Structures and Algorithms
 EC010 606L02 – Data Base Management Systems
 EC010 606L03 – High Speed Digital Design
 EC010 606L04 – Medical Electronics
 EC010 606L05 – Soft Computing Techniques
 EC010 606L06 – Television and Radar Engineering

7th Semester

Code	Subject	Hours/week			Marks		End-sem duration -hours	Credits
		L	T	P/D	Internal	End-sem		
EC010 701	VLSI Design	2	2	-	50	100	3	4
EC010 702	Information Theory and Coding	2	2	-	50	100	3	4
EC010 703	Microwave Engineering	2	1	-	50	100	3	3
EC010 704	Electronic Instrumentation	2	1	-	50	100	3	3
EC010 705	Embedded Systems	2	1	-	50	100	3	3
EC010 706Lxx	Elective II	2	2	-	50	100	3	4
EC010 707	Advanced Communication Lab	-	-	3	50	100	3	2
EC010 708	Signal Processing Lab	-	-	3	50	100	3	2
EC010 709	Seminar	-	-	2	50	-	-	2
EC010 710	Project	-	-	1	50	-	-	1
	Total	12	9	9				28

Elective II

EC010 706L01 – Optimization Techniques
 EC010 706L02 – Speech and Audio Processing
 EC010 706L03 – Digital Image Processing
 EC010 706L04 – Wavelets and Applications
 EC010 706L05 – Antenna Theory and Design
 EC010 706L06 – System Software

8th Semester

Code	Subject	Hours/week			Marks		End-sem duration- hours	Credit s
		L	T	P/D	Inte- rnal	End- sem		
EC010 801	Wireless Communication	3	2	-	50	100	3	4
EC010 802	Communication Networks	2	2	-	50	100	3	4
EC010 803	Light Wave Communication	2	2	-	50	100	3	4
EC010 804Lxx	Elective III	2	2	-	50	100	3	4
EC010 805Gxx	Elective IV	2	2	-	50	100	3	4
EC010 806	<i>VLSI and Embedded Systems Lab</i>	-	-	3	50	100	3	2
EC010 807	Project	-	-	6	100	-	-	4
EC010 808	Viva Voce	-	-	-	-	50	-	2
	Total	11	10	9				28

Electives III

EC010 804L01 – Nano Electronics
 EC010 804L02 – Micro Electro Mechanical Systems
 EC010 804L03 – Secure Communication
 EC010 804L04 – Management Information Systems
 EC010 804L05 – Pattern Recognition
 EC010 804L06 – R F Circuits

Electives IV

EC010 805G01 – Test Engineering
 EC010 805G02 – E-Learning
 EC010 805G03 – Mechatronics
 EC010 805G04 – Bio Informatics
 EC010 805G05 – Intellectual Property Rights
 EC010 805G06 – Professional Ethics



KERALA TECHNOLOGICAL UNIVERSITY

Curriculum for Semesters I and II

2015

Kerala Technological University
CET Campus, Thiruvananthapuram
Kerala -695016 India
Phone +91 471 2598122, 2598422
Fax +91 471 2598522
Web: ktu.edu.in
Email: university@ktu.edu.in

SEMESTER I

Slot	Course No.	Subject	L-T-P	Hours	Credits
A	MA101	Calculus	3-1-0	4	4
B (1/2)	PH100	Engineering Physics	3-1-0	4	4
	CY100	Engineering Chemistry	3-1-0	4	4
C (1/2)	BE100	Engineering Mechanics	3-1-0	4	4
	BE110	Engineering Graphics	1-1-2	4	3
D	BE101-0X	Introduction to _____ Engineering	2-1-0	3	3
E	BE103	Introduction to Sustainable Engineering	2-0-1	3	3
F (1/4)	CE100	Basics of Civil Engineering	2-1-0	3	3
	ME100	Basics of Mechanical Engineering	2-1-0	3	3
	EE100	Basics of Electrical Engineering	2-1-0	3	3
	EC100	Basics of Electronics Engineering	2-1-0	3	3
S (1/2)	PH110	Engineering Physics Lab	0-0-2	2	1
	CY110	Engineering Chemistry Lab	0-0-2	2	1
T (2/4)	CE110/ME110/ EE110/EC110/ CS110/CH110	Basic Engineering Workshops (CS110 for CS and related branches and CH110 for CH and related branches only)	0-0-2 + 0-0-2	2 2	1 1
U		U100 Language lab/ Bridge courses/ Remedial programmes/Micro Projects etc	0-0-3	3	
				30	24/23
V		V100 Entrepreneurship/TBI/NCC/NSS/ Physical Edn. etc	0-0-2	2	Activity points

SEMESTER II

Slot	Course No.	Subject	L-T-P	Hours	Credits
A	MA102	Differential Equations	3-1-0	4	4
B (1/2)	PH100	Engineering Physics	3-1-0	4	4
	CY100	Engineering Chemistry	3-1-0	4	4
C (1/2)	BE100	Engineering Mechanics	3-1-0	4	4
	BE110	Engineering Graphics	1-1-2	4	3
D	BE102	Design & Engineering	2-0-2	4	3
E, F (2/4)	CE 100	Basics of Civil Engineering	2-1-0	3	3
	ME 100	Basics of Mechanical Engineering	2-1-0	3	3
	EE 100	Basics of Electrical Engineering	2-1-0	3	3
	EC 100	Basics of Electronics Engineering	2-1-0	3	3
S (1/2)	PH110	Engineering Physics Lab	0-0-2	2	1
	CY110	Engineering Chemistry Lab	0-0-2	2	1
T (2/4)	CE110/ME110/ EE110/EC110	Basic Engineering Workshops	0-0-2	2	1
			+ 0-0-2	2	1
U		U100 Language lab / Bridge courses/ Remedial programmes/Micro Projects etc	0-0-2	2	
				30	24/23
V		V100 Entrepreneurship /TBI/NCC/NSS/ Physical Edn. etc	0-0-2	2	Activity points

Note: 1. Institutions can assign **two of four** Basics of Engineering courses not already taken by the student in the previous semester and the corresponding Workshop courses in Semester 2.



APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

**Curriculum
for
B.Tech Degree
Semesters III to VIII
2016**

Electronics and Communication Engineering

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

CET CAMPUS, THIRUVANANTHAPURAM – 695016

KERALA, INDIA

Phone +91 471 2598122, 2598422

Fax +91 471 2598522 Web: ktu.edu.in

Email: university@ktu.edu.in

BRANCH: Electronics & Communication Engineering**SEMESTER - 3**

Course Code	Course Name	L-T-P	Credits	Exam Slot
MA201	Linear Algebra & Complex Analysis	3-1-0	4	A
EC201	Network Theory	3-1-0	4	B
EC203	Solid State Devices	3-1-0	4	C
EC205	Electronic Circuits	3-1-0	4	D
EC207	Logic Circuit Design	3-0-0	3	E
HS200/ HS210	Business Economics/Life Skills	3-0-0/ 2-0-2	3	F
EC231	Electronic Devices & Circuits Lab	0-0-3	1	S
EC233	Electronic Design Automation Lab	0-0-3	1	T

Total Credits = 24**Hours: 28/29****Cumulative Credits= 71****SEMESTER - 4**

Course Code	Course Name	L-T-P	Credits	Exam Slot
MA204	Probability, Random Processes and Numerical Methods	3-1-0	4	A
EC202	Signals & Systems	3-1-0	4	B
EC204	Analog Integrated Circuits	4-0-0	4	C
EC206	Computer Organization	3-0-0	3	D
EC208	Analog Communication Engineering	3-0-0	3	E
HS210/ HS200	Life Skills/Business Economics	2-0-2/ 3-0-0	3	F
EC232	Analog Integrated Circuits Lab	0-0-3	1	S
EC230	Logic Circuit Design Lab	0-0-3	1	T

Total Credits = 23 Hours= 27/28Cumulative Credits= 94

BRANCH: Electronics & Communication Engineering**SEMESTER - 5**

Course Code	Course Name	L-T-P	Credits	Exam Slot
EC301	Digital Signal Processing	3-1-0	4	A
EC303	Applied Electromagnetic Theory	3-0-0	3	B
EC305	Microprocessors & Microcontrollers	3-0-0	3	C
EC307	Power Electronics & Instrumentation	3-0-0	3	D
HS300	Principles of Management	3-0-0	3	E
	Elective 1	3-0-0	3	F
EC341	Design Project	0-1-2	2	S
EC333	Digital Signal Processing Lab	0-0-3	1	T
EC335	Power Electronics & Instrumentation Lab	0-0-3	1	U

Total Credits = 23**Hours: 28****Cumulative Credits= 117**

- Elective 1:-**
1. EC361 Digital System Design
 2. EC363 Optimization Techniques
 3. EC365 Biomedical Engineering
 4. EC360 Soft Computing

BRANCH: Electronics & Communication Engineering**SEMESTER - 6**

Course Code	Course Name	L-T-P	Credits	Exam Slot
EC302	Digital Communication	4-0-0	4	A
EC304	VLSI	3-0-0	3	B
EC306	Antenna & Wave Propagation	3-0-0	3	C
EC308	Embedded System	3-0-0	3	D
EC312	Object Oriented Programming	3-0-0	3	E
	Elective 2	3-0-0	3	F
EC332	Communication Engg Lab (Analog & Digital)	0-0-3	1	S
EC334	Microcontroller Lab	0-0-3	1	T
EC352	Comprehensive Exam	0-1-1	2	U

Total Credits = 23**Hours: 27****Cumulative Credits= 140****Elective 2:-**

1. EC362 Modelling & Simulation of Communication Systems
2. EC366 Real Time Operating Systems
3. EC368 Robotics
4. EC370 Digital Image Processing

BRANCH: Electronics & Communication Engineering**SEMESTER - 7**

Course Code	Course Name	L-T-P	Credits	Exam Slot
EC401	Information Theory & Coding	4-0-0	4	A
EC403	Microwave & Radar Engg	3-0-0	3	B
EC405	Optical Communication	3-0-0	3	C
EC407	Computer Communication	3-0-0	3	D
EC409	Control Systems	3-0-0	3	E
	Elective 3	3-0-0	3	F
EC451	Seminar & Project Preliminary	0-1-4	2	S
EC431	Communication Systems Lab (Optical & Microwave)	0-0-3	1	T

Total Credits = 22**Hours: 27****Cumulative Credits= 162****Elective 3:-**

1. EC461 Microwave Devices and Circuits
2. EC463 Speech and Audio Signal Processing
3. EC465 MEMS
4. EC467 Pattern Recognition
5. EC469 Opto Electronic Devices

BRANCH: Electronics & Communication Engineering

SEMESTER - 8

Course Code	Course Name	L-T-P	Credits	Exam Slot
EC402	Nano electronics	3-0-0	3	A
EC404	Advanced Communication Systems	3-0-0	3	B
	Elective 4	3-0-0	3	C
	Elective 5 (Non Departmental)	3-0-0	3	D
EC492	Project		6	S

Total Credits = 18**Hours: 29****Cumulative Credits= 180****Elective 4:-**

1. EC462 Mixed Signal Circuit Design
2. EC464 Low Power VLSI Design
3. EC466 Cyber Security
4. EC468 Secure Communication
5. EC472 Integrated Optics & Photonic Systems
6. EC474 Computer Vision

ELECTIVE 5 (NON DEPARTMENTAL ELECTIVE COURSES)

(Note:- If the student has studied or is studying the elective course given in the bracket then the corresponding ND elective cannot be chosen)

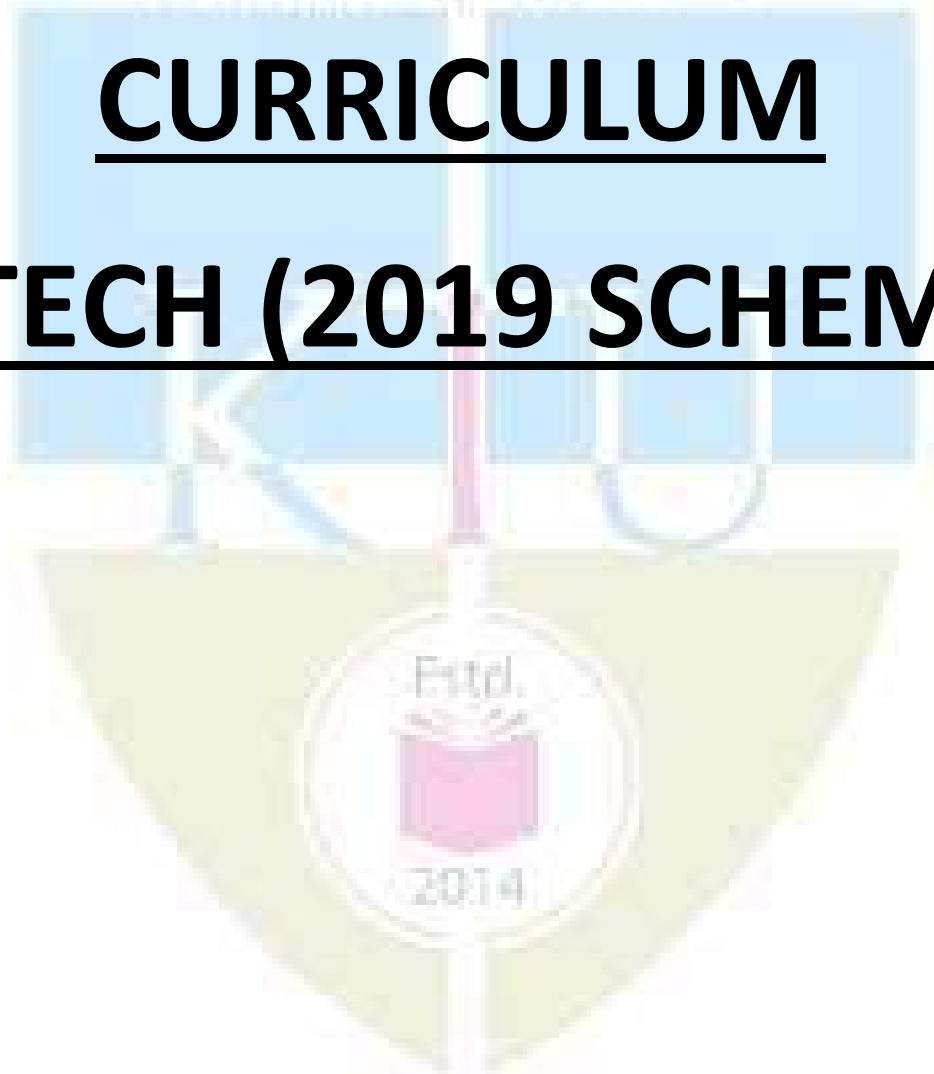
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1. AO482 FLIGHT AGAINST GRAVITY
 2. AE482 INDUSTRIAL INSTRUMENTATION
 3. AE484 INSTRUMENTATION SYSTEM DESIGN
 4. AU486 NOISE, VIBRATION AND HARSHNESS
 5. BM482 BIOMEDICAL INSTRUMENTATION
 6. BM484 MEDICAL IMAGING & IMAGE PROCESSING TECHNIQUES
 7. BT461 DESIGN OF BIOLOGICAL WASTEWATER SYSTEMS
 8. BT362 SUSTAINABLE ENERGY PROCESSES
 9. CH482 PROCESS UTILITIES AND PIPE LINE DESIGN
 10. CH484 FUEL CELL TECHNOLOGY
 11. CE482 ENVIRONMENTAL IMPACT ASSESSMENT
 12. CE484 APPLIED EARTH SYSTEMS
 13. CE486 GEO INFORMATICS FOR INFRASTRUCTURE MANAGEMENT
 14. CE488 DISASTER MANAGEMENT
 15. CE494 ENVIRONMENT HEALTH AND SAFETY
 16. CS482 DATA STRUCTURES
 17. CS484 COMPUTER GRAPHICS
 18. CS488 C # AND .NET PROGRAMMING
 19. EE482 ENERGY MANAGEMENT AND AUDITING
 20. EE486 SOFT COMPUTING (EC 360 SOFT COMPUTING)
 21. EE488 INDUSTRIAL AUTOMATION
 22. EE494 INSTRUMENTATION SYSTEMS
 23. FT482 FOOD PROCESS ENGINEERING

24. FT484	FOOD STORAGE ENGINEERING
25. FT486	FOOD ADDITIVES AND FLAVOURING
26. IE482	FINANCIAL MANAGEMENT
27. IE484	INTRODUCTION TO BUSINESS ANALYTICS
28. IE486	DESIGN AND ANALYSIS OF EXPERIMENTS
29. IE488	TOTAL QUALITY MANAGEMENT
30. IC482	BIOMEDICAL SIGNAL PROCESSING
31. IT482	INFORMATION STORAGE MANAGEMENT
32. MA482	APPLIED LINEAR ALGEBRA
33. MA484	OPERATIONS RESEARCH (EC 363 OPTIMISATION TECHNIQUES)
34. MA486	ADVANCED NUMERICAL COMPUTATIONS
35. MA488	CRYPTOGRAPHY
36. ME484	FINITE ELEMENT ANALYSIS
37. ME482	ENERGY CONSERVATION AND MANAGEMENT
38. ME471	OPTIMIZATION TECHNIQUES (EC 363 OPTIMISATION TECHNIQUES)
39. MP482	PRODUCT DEVELOPMENT AND DESIGN
40. MP469	INDUSTRIAL PSYCHOLOGY & ORGANIZATIONAL BEHAVIOUR
41. MP484	PROJECT MANAGEMENT
42. MT482	INDUSTRIAL SAFETY
43. MR482	MECHATRONICS
44. FS482	RESPONSIBLE ENGINEERING
45. SB482	DREDGERS AND HARBOUR CRAFTS
46. HS482	PROFESSIONAL ETHICS

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CURRICULUM

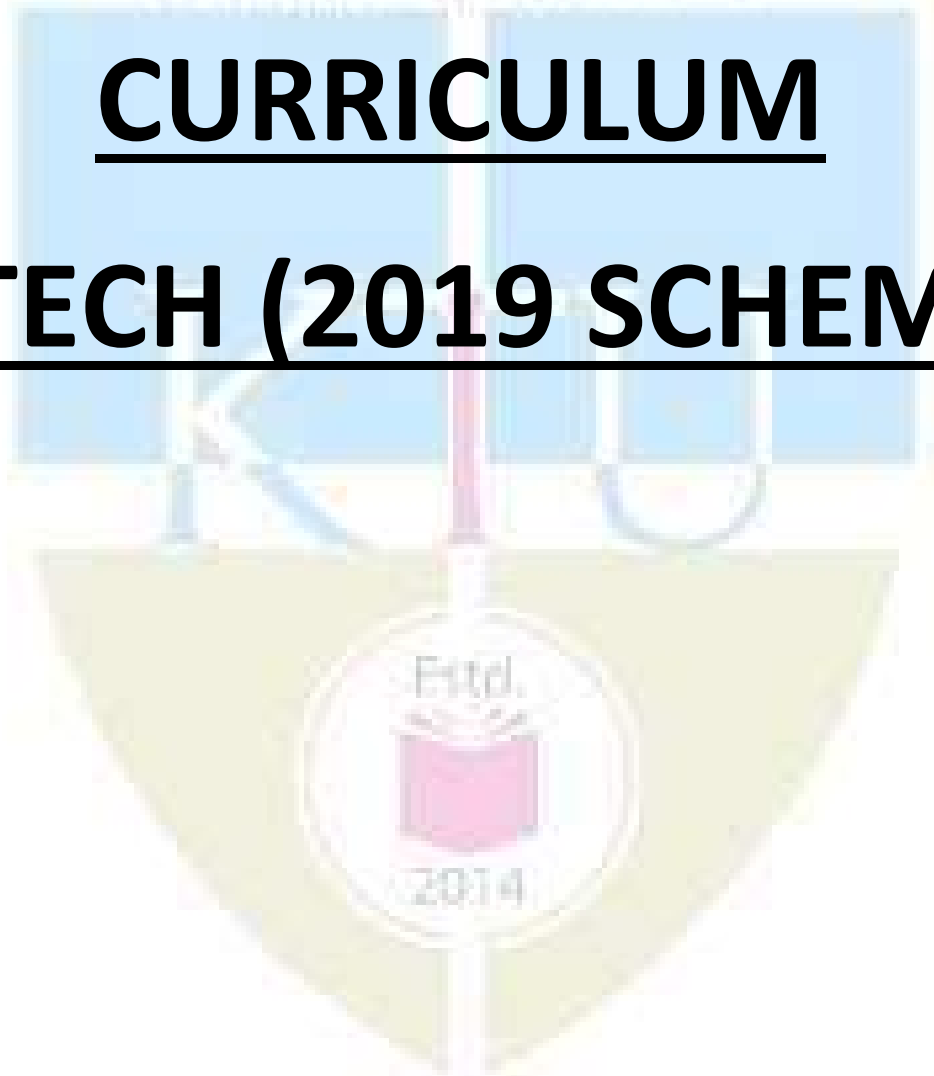
B.TECH (2019 SCHEME)



AMU ABDUL KALAM
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UNIVERSITY

CURRICULUM

B.TECH (2019 SCHEME)



CURRICULUM I TO VIII: B.Tech ELECTRONICS & COMMUNICATION ENGINEERING

Every course of B. Tech. Program shall be placed in one of the nine categories as listed in table below.

Sl. No	Category	Code	Credits
1	Humanities and Social Sciences including Management courses	HMC	8
2	Basic Science courses	BSC	26
3	Engineering Science Courses	ESC	22
4	Program Core Courses	PCC	76
5	Program Elective Courses	PEC	15
6	Open Elective Courses	OEC	3
7	Project work and Seminar	PWS	10
8	Mandatory Non-credit Courses (P/F) with grade	MNC	-----
9	Mandatory Student Activities (P/F)	MSA	2
	Total Mandatory Credits		162
10	Value Added Course (Optional)	VAC	20

No semester shall have more than six lecture-based courses and two laboratory and/or drawing/seminar/project courses in the curriculum.

Semester-wise credit distribution shall be as below:

Semester	1	2	3	4	5	6	7	8	Total
Credits	17	21	22	22	23	23	15	17	160
Activity Points	50				50				---
Credits for Activity	2								2
Grand.Total									162

ELECTRONICS & COMMUNICATION ENGINEERING

Basic Science Courses: Maths, Physics, Chemistry, Biology for Engineers, Life Science etc

Engineering science courses: Basic Electrical, Engineering Graphics, Programming, Workshop, Basic Electronics, Basic Civil, Engineering Mechanics, Mechanical Engineering, Thermodynamics, Design Engineering, Materials Engineering etc.

Humanities and Social Sciences including Management courses: English, Humanities, Professional Ethics, Management, Finance & Accounting, Life skills, Professional Communication, Economics etc

Mandatory non-credit courses: Sustainable Engineering, Constitution of India/Essence of Indian Knowledge Tradition, Industrial Safety Engineering, disaster management etc.

Course Code and Course Number

Each course is denoted by a unique code consisting of three alphabets followed by three numerals like E C L 2 0 1. The first two letter code refers to the department offering the course. EC stands for course in Electronics & Communication, course code MA refers to a course in Mathematics, course code ES refers to a course in Engineering Science etc. Third letter stands for the nature of the course as indicated in the following table.

Code	Description
T	Theory based courses (other the lecture hours, these courses can have tutorial and practical hours, e.g., L-T-P structures 3-0-0, 3-1-2, 3-0-2 etc.)
L	Laboratory based courses (where performance is evaluated primarily on the basis of practical or laboratory work with LTP structures like 0-0-3, 1-0-3, 0-1-3 etc.)
N	Non-credit courses
D	Project based courses (Major, Mini Projects)
Q	Seminar Courses

Course Number is a three digit number and the first digit refers to the Academic year in which the course is normally offered, i.e. 1, 2, 3, or 4 for the B. Tech. Programme of four year duration. Of the other two digits, the last digit identifies whether the course is offered normally in the odd (odd number), even (even number) or in both the semesters (zero). The middle number could be any digit. ECL 201 is a laboratory course offered in EC department for third semester, MAT 101 is a course in Mathematics offered in the first semester, EET 344 is a course in Electrical Engineering offered in the sixth semester, PHT 110 is a course in Physics offered both the first and second semesters, EST 102 is a course in Basic Engineering offered by one or many departments. These course numbers are to be given in the curriculum and syllabi.

Departments

Each course is offered by a Department and their two-letter course prefix is given in Table 2.

Table 2: Departments and their codes

Sl.No	Department	Course Prefix	Sl.No	Department	Course Prefix
01	Aeronautical Engg	AO	16	Information Technology	IT
02	Applied Electronics & Instrumentation	AE	17	Instrumentation & Control	IC
03	Automobile	AU	18	Mandatory Courses	MC
04	Biomedical Engg	BM	19	Mathematics	MA
05	Biotechnology	BT	20	Mechanical Engg	ME
06	Chemical Engg	CH	21	Mechatronics	MR
07	Chemistry	CY	22	Metallurgy	MT
08	Civil Engg	CE	23	Mechanical (Auto)	MU
09	Computer Science	CS	24	Mechanical(Prod)	MP
10	Electrical & Electronics	EE	25	Naval & Ship Building	SB
11	Electronics & Biomedical	EB	26	Physics	PH
12	Electronics & Communication	EC	27	Polymer Engg	PO
13	Food Technology	FT	28	Production Engg	PE
14	Humanities	HU	29	Robotics and Automation	RA
15	Industrial Engg	IE	30	Safety & Fire Engg	FS

ELECTRONICS & COMMUNICATION ENGINEERING

SEMESTER I

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	MAT 101	LINEAR ALGEBRA AND CALCULUS	3-1-0	4	4
B 1/2	PHT 100	ENGINEERING PHYSICS A	3-1-0	4	4
	CYT 100	ENGINEERING CHEMISTRY	3-1-0	4	4
C 1/2	EST 100	ENGINEERING MECHANICS	2-1-0	3	3
	EST 110	ENGINEERING GRAPHICS	2-0-2	4	3
D 1/2	EST 120	BASICS OF CIVIL & MECHANICAL ENGINEERING	4-0-0	4	4
	EST 130	BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING	4-0-0	4	4
E	HUN 101	LIFE SKILLS	2-0-2	4	--
S 1/2	PHL 120	ENGINEERING PHYSICS LAB	0-0-2	2	1
	CYL 120	ENGINEERING CHEMISTRY LAB	0-0-2	2	1
T 1/2	ESL 120	CIVIL & MECHANICAL WORKSHOP	0-0-2	2	1
	ESL 130	ELECTRICAL & ELECTRONICS WORKSHOP	0-0-2	2	1
TOTAL				23/24 *	17

*Minimum hours per week

Note:

To make up for the hours lost due to induction program, one extra hour may be allotted to each course

SEMESTER II

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	MAT 102	VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TRANSFORMS	3-1-0	4	4
B 1/2	PHT 100	ENGINEERING PHYSICS A	3-1-0	4	4
	CYT 100	ENGINEERING CHEMISTRY	3-1-0	4	4
C 1/2	EST 100	ENGINEERING MECHANICS	2-1-0	3	3
	EST 110	ENGINEERING GRAPHICS	2-0-2	4	3
D 1/2	EST 120	BASICS OF CIVIL & MECHANICAL ENGINEERING	4-0-0	4	4
	EST 130	BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING	4-0-0	4	4
E	HUT 102	PROFESSIONAL COMMUNICATION	2-0-2	4	--
F	EST 102	PROGRAMMING IN C	2-1-2	5	4
S 1/2	PHL 120	ENGINEERING PHYSICS LAB	0-0-2	2	1
	CYL 120	ENGINEERING CHEMISTRY LAB	0-0-2	2	1
T 1/2	ESL 120	CIVIL & MECHANICAL WORKSHOP	0-0-2	2	1
	ESL 130	ELECTRICAL & ELECTRONICS WORKSHOP	0-0-2	2	1
TOTAL				28/29	21

NOTE:

1. Engineering Physics A and Engineering Chemistry shall be offered in both semesters. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Engineering Physics A in S1 and Engineering Chemistry in S2 & vice versa. Students opting for Engineering Physics A in a semester should attend Physics Lab in the same semester and students opting for Engineering Chemistry in one semester should attend Engineering Chemistry Lab in the same semester.
2. Engineering Mechanics and Engineering Graphics shall be offered in both semesters. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Engineering Mechanics in S1 and Engineering Graphics in S2 & vice versa.
3. Basics of Civil & Mechanical Engineering and Basics of Electrical & Electronics Engineering shall be offered in both semesters. Basics of Civil & Mechanical Engineering contain equal weightage for

ELECTRONICS & COMMUNICATION ENGINEERING

Civil Engineering and Mechanical Engineering. Slot for the course is D with CIE marks of 25 each and ESE marks of 50 each. Students belonging to branches of AEI, EI, BME, ECE, EEE, ICE, CSE, IT, RA can choose this course in S1.

Basics of Electrical & Electronics Engineering contain equal weightage for Electrical Engineering and Electronics Engineering. Slot for the course is D with CIE marks of 25 each and ESE marks of 50 each. Students belonging to AERO, AUTO, CE, FSE, IE, ME, MECHATRONICS, PE, METTULURGY, BT, BCE, CHEM, FT, POLY can choose this course in S1. Students having Basics of Civil & Mechanical Engineering in one semester should attend Civil & Mechanical Workshop in the same semester and students having Basics of Electrical & Electronics Engineering in a semester should attend Electrical & Electronics Workshop in the same semester.

4. LIFE SKILLS

Life skills are those competencies that provide the means for an individual to be resourceful and positive while taking on life's vicissitudes. Development of one's personality by being aware of the self, connecting with others, reflecting on the abstract and the concrete, leading and generating change, and staying rooted in time-tested values and principles is being aimed at. This course is designed to enhance the employability and maximize the potential of the students by introducing them to the principles that underlie personal and professional success, and help them acquire the skills needed to apply these principles in their lives and careers.

5. PROFESSIONAL COMMUNICATION

Objective is to develop in the under-graduate students of engineering a level of competence in English required for independent and effective communication for their professional needs. Coverage: Listening, Barriers to listening, Steps to overcome them, Purposive listening practice, Use of technology in the professional world. Speaking, Fluency & accuracy in speech, Positive thinking, Improving self-expression, Tonal variations, Group discussion practice, Reading, Speed reading practice, Use of extensive readers, Analytical and critical reading practice, Writing Professional Correspondence, Formal and informal letters, Tone in formal writing, Introduction to reports. Study Skills, Use of dictionary, thesaurus etc., Importance of contents page, cover & back pages, Bibliography, Language Lab.

Semester III

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	MAT201	PARTIAL DIFFERENTIAL EQUATION AND COMPLEX ANALYSIS	3-1-0	4	4
B	ECT 201	SOLID STATE DEVICES	3-1-0	4	4
C	ECT 203	LOGIC CIRCUIT DESIGN	3-1-0	4	4
D	ECT 205	NETWORK THEORY	3-1-0	4	4
E 1/2	EST200	DESIGN AND ENGINEERING	2-0-0	2	2
	HUT200	PROFESSIONAL ETHICS	2-0-0	2	2
F	MCN201	SUSTAINABLE ENGINEERING	2-0-0	2	--
S	ECL 201	SCIENTIFIC COMPUTING LAB	0-0-3	3	2
T	ECL 203	LOGIC DESIGN LAB	0-0-3	3	2
R/M	VAC	Remedial/Minor course	3-1-0	4**	4
TOTAL				26/30	22/26

NOTE:

- Design & Engineering and Professional Ethics shall be offered in both S3 and S4. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Design & Engineering in S3 and Professional Ethics in S4 & vice versa.
- *All Institutions shall keep 4 hours exclusively for Remedial class/Minor course (Thursdays from 3 to 5 PM and Fridays from 2 to 4 PM). If a student does not opt for minor programme, he/she can be given remedial class.

Semester IV

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	MAT 204	PROBABILITY, RANDOM PROCESS AND NUMERICAL METHODS	3-1-0	4	4
B	ECT 202	ANALOG CIRCUITS	3-1-0	4	4
C	ECT 204	SIGNALS AND SYSTEMS	3-1-0	4	4
D	ECT 206	COMPUTER ARCHITECTURE AND MICROCONTROLLERS	3-1-0	4	4
E 1/2	EST200	DESIGN AND ENGINEERING	2-0-0	2	2
	HUT200	PROFESSIONAL ETHICS	2-0-0	2	2
F	MCN202	CONSTITUTION OF INDIA	2-0-0	2	--
S	ECL 202	ANALOG CIRCUITS AND SIMULATION LAB	0-0-3	3	2
T	ECL 204	MICROCONTROLLER LAB	0-0-3	3	2
R/M/H	VAC	Remedial/Minor/Honours course	3-1-0	4**	4
TOTAL				26/30	22/26

NOTE:

1. Design & Engineering and Professional Ethics shall be offered in both S3 and S4. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Design & Engineering in S3 and Professional Ethics in S4 & vice versa.
2. *All Institutions should keep 4 hours exclusively for Remedial class/Minor course (Thursdays from 3 to 5 PM and Fridays from 2 to 4 PM). If a student does not opt for minor programme, he/she can be given remedial class.

Semester V

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	ECT 301	LINEAR INTEGRATED CIRCUITS	3-1-0	4	4
B	ECT 303	DIGITAL SIGNAL PROCESSING	3-1-0	4	4
C	ECT 305	ANALOG AND DIGITAL COMMUNICATION	3-1-0	4	4
D	ECT 307	CONTROL SYSTEMS	3-1-0	4	4
E 1/2	HUT300	INDUSTRIAL ECONOMICS AND FOREIGN TRADE	3-0-0	3	3
	HUT310	MANAGEMENT FOR ENGINEERS	3-0-0	3	3
F	MCN301	DISASTER MANAGEMENT	2-0-0	2	--
S	ECL 331	ANALOG INTEGRATED CIRCUITS AND SIMULATION LAB	0-0-3	3	2
T	ECL 333	DIGITAL SIGNAL PROCESSING LAB	0-0-3	3	2
R/M/H	VAC	Remedial/Minor/Honours course	3-1-0	4**	4
TOTAL				27/31	23/27

NOTE:

1. Industrial Economics & Foreign Trade and Management for Engineers shall be offered in both S5 and S6. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Industrial Economics & Foreign Trade in S5 and Management for Engineers in S6 and vice versa.
2. *All Institutions should keep 4 hours exclusively for Remedial class/Minor/Honours course (Tuesdays from 3 to 5 PM and Wednesdays from 3 to 5 PM). If a student does not opt for minor/honours programme, he/she can be given remedial class.

Semester VI

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	ECT 302	ELECTROMAGNETICS	3-1-0	4	4
B	ECT 304	VLSI CIRCUIT DESIGN	3-1-0	4	4
C	ECT 306	INFORMATION THEORY AND CODING	3-1-0	4	4
D	ECTXXX	PROGRAM ELECTIVE I	2-1-0	3	3
E ½	HUT300	INDUSTRIAL ECONOMICS AND FOREIGN TRADE	3-0-0	3	3
	HUT310	MANAGEMENT FOR ENGINEERS	3-0-0	3	3
F	ECT 308	COMPREHENSIVE COURSE WORK	1-0-0	1	1
S	ECL 332	COMMUNICATION LAB	0-0-3	3	2
T	ECD 334	MINIPROJECT	0-0-3	3	2
R/M/H	VAC	Remedial/Minor/Honours course	3-1-0	4**	4
TOTAL				25/29	23/27

PROGRAM ELECTIVE I

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
D	ECT 312	Digital System Design	2-1-0	3	3
	ECT 322	Power Electronics	2-1-0		
	ECT 332	Data Analysis	2-1-0		
	ECT 342	Embedded Systems	2-1-0		
	ECT 352	Digital Image Processing	2-1-0		
	ECT 362	Introduction to MEMS	2-1-0		
	ECT 372	Quantum Computing	2-1-0		

NOTE:

1. Industrial Economics & Foreign Trade and Management for Engineers shall be offered in both S5 and S6. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Industrial Economics & Foreign Trade in S5 and Management for Engineers in S6 and vice versa.

2. *All Institutions should keep 4 hours exclusively for Remedial class/Minor/Honours course (Tuesdays from 3 to 5 PM and Wednesdays from 2 to 4 PM). If a student does not opt for minor/honours programme, he/she can be given remedial class.
3. Comprehensive Course Work: The comprehensive course work in the sixth semester of study shall have a written test of 50 marks. The written examination will be of objective type similar to the GATE examination and will be conducted by the University. **Syllabus for comprehensive examination shall be prepared by the respective BoS choosing any 5 core courses studied from semester 3 to 5.** The pass minimum for this course is 25. The course should be mapped with a faculty and classes shall be arranged for practising questions based on the core courses listed in the curriculum.
4. Mini project: It is introduced in sixth semester with a specific objective to strengthen the understanding of student's fundamentals through application of theoretical concepts. Mini project can help to boost their skills and widen the horizon of their thinking. The ultimate aim of an engineering student is to resolve a problem by applying theoretical knowledge. Doing more projects increases problem-solving skills. Students should identify a topic of interest in consultation with Faculty/Advisor. Review the literature and gather information pertaining to the chosen topic. State the objectives and develop a methodology to achieve the objectives. Carryout the design/fabrication or develop codes/programs to achieve the objectives. Demonstrate the novelty of the project through the results and outputs. The progress of the mini project is evaluated based on a minimum of two reviews. The review committee may be constituted by the Head of the Department. A project report is required at the end of the semester. The product has to be demonstrated for its full design specifications. Innovative design concepts, reliability considerations, aesthetics/ergonomic aspects taken care of in the project shall be given due weight. The internal evaluation will be made based on the product, the report and a viva- voce examination, conducted by a 3 member committee appointed by Head of the Department comprising HoD or a senior faculty member, Academic coordinator for that program, project guide/coordinator.

Total marks: 150, CIE 75 marks and ESE 75 marks

Split up for CIE

Attendance : 10

Guide : 15

Project Report : 10

Evaluation by the Committee (will be evaluating the level of completion and demonstration of functionality/specifications, presentation, oral examination, work knowledge and involvement)

: 40

Semester VII

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	ECT 401	WIRELESS COMMUNICATION	2-1-0	3	3
B	ECTXXX	PROGRAM ELECTIVE II	2-1-0	3	3
C	ECTXXX	OPEN ELECTIVE	2-1-0	3	3
D	MCN401	INDUSTRIAL SAFETY ENGINEERING	2-1-0	3	---
S	ECL 411	ELECTROMAGNETICS LAB	0-0-3	3	2
T	ECQ 413	SEMINAR	0-0-3	3	2
U	ECD 415	PROJECT PHASE I	0-0-6	6	2
R/M/H	VAC	Remedial/Minor/Honors course	3-1-0	4*	4
TOTAL				24/28	15/19

PROGRAM ELECTIVE II

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
B	ECT 413	Optical Fiber Communication	2-1-0	3	3
	ECT 423	Computer Networks	2-1-0		
	ECT 433	Opto-electronic Devices	2-1-0		
	ECT 443	Antenna and Wave propagation	2-1-0		
	ECT 453	Error Control Codes	2-1-0		
	ECT 463	Machine Learning	2-1-0		
	ECT 473	DSP Architectures	2-1-0		

OPEN ELECTIVE (OE)

The open elective is offered in semester 7. Each program should specify the courses (maximum 5) they would like to offer as electives for other programs. The courses listed below are offered by the **Department of ELECTRONICS AND COMMUNICATION ENGINEERING** for students of other undergraduate branches offered in the college under KTU.

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
C	ECT 415	Mechatronics	2-1-0	3	3
	ECT 425	Biomedical Instrumentation	2-1-0		
	ECT 435	Electronic Hardware for Engineers	2-1-0		
	ECT 445	IoT and Applications	2-1-0		
	ECT 455	Entertainment Electronics	2-1-0		

NOTE:

1. *All Institutions should keep 4 hours exclusively for Remedial class/Minor/Honours course (Mondays from 10 to 12 and Wednesdays from 10 to 12 Noon). If a student does not opt for minor/honours programme, he/she can be given remedial class.
2. Seminar: To encourage and motivate the students to read and collect recent and reliable information from their area of interest confined to the relevant discipline from technical publications including peer reviewed journals, conference, books, project reports etc., prepare a report based on a central theme and present it before a peer audience. Each student shall present the seminar for about 20 minutes duration on the selected topic. The report and the presentation shall be evaluated by a team of faculty members comprising Academic coordinator for that program, seminar coordinator and seminar guide based on style of presentation, technical content, adequacy of references, depth of knowledge and overall quality of the report.

Total marks: 100, only CIE, minimum required to pass 50

Attendance : 10

Guide : 20

Technical Content of the Report : 30

Presentation : 40

3. Project Phase I: A Project topic must be selected either from research literature or the students themselves may propose suitable topics in consultation with their guides. The object of Project Work I is to enable the student to take up investigative study in the broad field of Electronics and Communication Engineering, either fully theoretical/practical or involving both theoretical and practical work to be assigned by the Department on a group of three/four students, under the guidance of a Supervisor. This is expected to provide a good initiation for the student(s) in R&D work. The assignment to normally include:
 - Survey and study of published literature on the assigned topic;
 - Preparing an Action Plan for conducting the investigation, including team work;
 - Working out a preliminary Approach to the Problem relating to the assigned topic;
 - Block level design documentation
 - Conducting preliminary Analysis/ Modelling/ Simulation/ Experiment/ Design/ Feasibility;

ELECTRONICS & COMMUNICATION ENGINEERING

- Preparing a Written Report on the Study conducted for presentation to the Department;
- Final Seminar, as oral Presentation before the evaluation committee.

Total marks: 100, only CIE, minimum required to pass 50

Guide : 30

Interim evaluation by the evaluation committee : 20

Final Seminar : 30

The report evaluated by the evaluation committee : 20

The evaluation committee comprises HoD or a senior faculty member, Project coordinator and project supervisor.



Semester VIII

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	ECT 402	INSTRUMENTATION	2-1-0	3	3
B	ECTXXX	PROGRAM ELECTIVE III	2-1-0	3	3
C	ECTXXX	PROGRAM ELECTIVE IV	2-1-0	3	3
D	ECTXXX	PROGRAM ELECTIVE V	2-1-0	3	3
E	ECT 404	COMPREHENSIVE VIVA VOCE	1-0-0	1	1
U	ECD 416	PROJECT PHASE II	0-0-12	12	4
R/M/H	VAC	Remedial/Minor/Honors course	3-1-0	4*	4
TOTAL				25/28	17/21

PROGRAM ELECTIVE III

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
B	ECT 414	Biomedical Engineering	2-1-0	3	3
	ECT 424	Satellite Communication	2-1-0		
	ECT 434	Secure Communication	2-1-0		
	ECT 444	Pattern Recognition	2-1-0		
	ECT 454	RF Circuit Design	2-1-0		
	ECT 464	Mixed Signal Circuit Design	2-1-0		
	ECT 474	Entrepreneurship	2-1-0		

PROGRAM ELECTIVE IV

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
C	ECT 416	Modern Communication Systems	2-1-0	3	3
	ECT 426	Real Time Operating Systems	2-1-0		
	ECT 436	Adaptive Signal Processing	2-1-0		
	ECT 446	Microwave Devices and Circuits	2-1-0		
	ECT 456	Speech and Audio Processing	2-1-0		
	ECT 466	Analog CMOS Design	2-1-0		
	ECT 476	Robotics	2-1-0		

PROGRAM ELECTIVE V

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
D	ECT 418	Mechatronics	2-1-0	3	3
	ECT 428	Optimization Techniques	2-1-0		
	ECT 438	Computer Vision	2-1-0		
	ECT 448	Low Power VLSI	2-1-0		
	ECT 458	Internet of Things	2-1-0		
	ECT 468	Renewable Energy Systems	2-1-0		
	ECT 478	Organic Electronics	2-1-0		

NOTE:

1. *All Institutions should keep 4 hours exclusively for Remedial class/Minor/Honours course (Mondays from 10 to 12 and Wednesdays from 10 to 12). If a student does not opt for minor/honours programme, he/she can be given remedial class.
2. Comprehensive Course Viva: The comprehensive course viva in the eighth semester of study shall have a viva voce for 50 marks. The viva voce shall be conducted based on the core subjects studied from third to eighth semester. The viva voce will be conducted by the same three member committee assigned for final project phase II evaluation towards the end of the semester. The pass minimum for this course is 25. The course should be mapped with a faculty and classes shall be arranged for practising questions based on the core courses listed in the curriculum. The mark will be treated as internal and should be uploaded along with internal marks of other courses.
3. Project Phase II: The object of Project Work II & Dissertation is to enable the student to extend further the investigative study taken up in Project 1, either fully theoretical/practical or involving both theoretical and practical work, under the guidance of a Supervisor from the Department alone or jointly with a Supervisor drawn from R&D laboratory/Industry. This is expected to provide a good training for the student(s) in R&D work and technical leadership. The assignment to normally include:
 - In depth study of the topic assigned in the light of the Report prepared under Phase I;
 - Review and finalization of the Approach to the Problem relating to the assigned topic;
 - Detailed Analysis/Modelling/Simulation/Design/Problem Solving/Experiment as needed;
 - Final development of product/process, testing, results, conclusions and future directions;
 - Preparing a paper for Conference presentation/Publication in Journals, if possible;
 - Preparing a Dissertation in the standard format for being evaluated by the Department;
 - Final Presentation before a Committee

Total marks: 150, only CIE, minimum required to pass 75

Guide : 30

Interim evaluation, 2 times in the semester by the evaluation committee : 50

Quality of the report evaluated by the above committee : 30

(The evaluation committee comprises HoD or a senior faculty member, Project coordinator and project supervisor).

Final evaluation by a three member committee : 40

(The final evaluation committee comprises Project coordinator, expert from Industry/research Institute and a senior faculty from a sister department. The same committee will conduct comprehensive course viva for 50 marks).

MINOR

Minor is an additional credential a student may earn if s/he does 20 credits worth of additional learning in a discipline other than her/his major discipline of B.Tech degree. The objective is to permit a student to customize their Engineering degree to suit their specific interests. Upon completion of an Engineering Minor, a student will be better equipped to perform interdisciplinary research and will be better employable. Engineering Minors allow a student to gain interdisciplinary experience and exposure to concepts and perspectives that may not be a part of their major degree programs.

The academic units offering minors in their discipline will prescribe the set of courses and/or other activities like projects necessary for earning a minor in that discipline. A specialist basket of 3-6 courses is identified for each Minor. Each basket may rest on one or more foundation courses. A basket may have sequences within it, i.e., advanced courses may rest on basic courses in the basket. S/he accumulates credits by registering for the required courses, and if the requirements for a particular minor are met within the time limit for the course, the minor will be awarded. This will be mentioned in the Degree Certificate as "Bachelor of Technology in xxx with Minor in yyy". The fact will also be reflected in the consolidated grade card, along with the list of courses taken. If one specified course cannot be earned during the course of the programme, that minor will not be awarded. The individual course credits earned, however, will be reflected in the consolidated grade card.

(i) The curriculum/syllabus committee/BoS shall prepare syllabus for courses to be included in the curriculum from third to eight semesters for all branches. The minor courses shall be identified by **M slot courses**.

(ii) Registration is permitted for Minor at the beginning of third semester. Total credits required is 182 (162 + 20 credits from value added courses)

(iii) Out of the 20 Credits, 12 credits shall be earned by undergoing a minimum of three courses listed in the curriculum for minor, of which one course shall be a mini project based on the chosen area. They can do miniproject either in S7 or in S8. The remaining 8 credits could be acquired by undergoing 2 MOOCs recommended by the Board of studies and approved by the Academic Council or through courses listed in the curriculum. The classes for Minor shall be conducted along with regular classes and no extra time shall be required for conducting the courses.

(iv) There won't be any supplementary examination for the courses chosen for Minor.

(v) On completion of the program, "Bachelor of Technology in xxx with Minor in yyy" will be awarded.

ELECTRONICS & COMMUNICATION ENGINEERING

(vi) The registration for minor program will commence from semester 3 and the all academic units offering minors in their discipline should prescribe set of such courses. The courses shall be grouped into maximum of 3 baskets. The basket of courses may have sequences within it, i.e., advanced courses may rest on basic courses in the basket. Reshuffling of courses between various baskets will not be allowed. In any case, they should carry out a mini project based on the chosen area in S7 or S8. Students who have registered for B.Tech Minor in **ELECTRONICS AND COMMUNICATION** can opt to study the courses listed below:

SE ME STE R	BASKET I				BASKET II				BASKET III			
	COURS E NO.	COURSE NAME	H O U R S	C R E D I T S	COURS E NO.	COURSE NAME	H O U R S	C R E D I T S	COURS E NO.	COURSE NAME	H O U R S	C R E D I T S
S3	ECT281	ELECTRONIC CIRCUITS	4	4	ECT283	ANALOG COMMUNICATI ON	4	4	ECT285	INTRODUCTION TO SIGNALS AND SYSTEMS	4	4
S4	ECT282	MICROCONT ROLLERS	4	4	ECT284	DIGITAL COMMUNICATI ON	4	4	ECT286	INTRODUCTION TO DIGITAL SIGNAL PROCESSING	4	4
S5	ECT381	EMBEDDED SYSTEM DESIGN	4	4	ECT383	COMMUNICATI ON SYSTEMS	4	4	ECT385	TOPICS IN DIGITAL IMAGE PROCESSING	4	4
S6	ECT382	VLSI CIRCUITS	4	4	ECT384	DATA NETWORKS	4	4	ECT386	TOPICS IN COMPUTER VISION	4	4
S7	ECD481	MINIPROJECT	4	4	ECD481	MINIPROJECT	4	4	ECD481	MINIPROJECT	4	4
S8	ECD482	MINIPROJECT	4	4	ECD482	MINIPROJECT	4	4	ECD482	MINIPROJECT	4	4

HONOURS

Honours is an additional credential a student may earn if s/he opts for the extra 20 credits needed for this in her/his own discipline. Honours is not indicative of class. KTU is providing this option for academically extra brilliant students to acquire Honours. Honours is intended for a student to gain expertise/specialise in an area inside his/her major B.Tech discipline and to enrich knowledge in emerging/advanced areas in the branch of engineering concerned. It is particularly suited for students aiming to pursue higher studies. Upon completion of Honours, a student will be better equipped to perform research in her/his branch of engineering. On successful accumulation of credits at the end of the programme, this will be mentioned in the Degree Certificate as "Bachelor of Technology in xxx, with Honours." The fact will also be reflected in the consolidated grade card, along with the list of courses taken. If one specified course cannot be earned during the course of the programme, Honours will not be awarded. The individual course credits earned, however, will be reflected in the consolidated grade card.

The courses shall be grouped into maximum of 3 groups, each group representing a particular specialization in the branch. The students shall select only the courses from same group in all semesters. It means that the specialization is to be fixed by the student and cannot be changed subsequently. The internal evaluation, examination and grading shall be exactly as for other mandatory courses. The Honours courses shall be identified by H slot courses.

- (i) The curriculum/syllabus committee/BoS shall prepare syllabus for courses to be included in the curriculum from fourth to eight semesters for all branches. The honours courses shall be identified by H slot courses.
- (ii) Registration is permitted for Honours at the beginning of fourth semester. Total credits required is 182 (162 + 20 credits from value added courses).
- (iii) Out of the 20 Credits, 12 credits shall be earned by undergoing a minimum of three courses listed in the curriculum for honours, of which one course shall be a mini project based on the chosen area. The remaining 8 credits could be acquired by undergoing 2 MOOCs recommended by the Board of studies and approved by the Academic Council or through courses listed in the curriculum. The classes for Honours shall be conducted along with regular classes and no extra time shall be required for conducting the courses. The students should earn a grade of 'C' or better for all courses under honours.
- (iv) There won't be any supplementary examination for the courses chosen for honours.
- (v) On successful accumulation of credits at the end of the programme, "Bachelor of Technology in xxx, with Honours" will be awarded if overall CGPA is greater than or equal to 8.5, earned a grade of 'C' or better for all courses chosen for honours and without any history of 'F' Grade.
- (vi) The registration for Honours program will commence from semester 4 and the all academic units offering honours in their discipline should prescribe set of such courses. The courses shall be grouped into maximum of 3 groups, each group representing a particular specialization in the branch. The students shall select only the courses from same group in all semesters. It means that the specialization is to be fixed by the student and cannot be changed subsequently. In any case, they should carry out a mini project based on the chosen area in S8. Students who have registered for B.Tech Honours in **ELECTRONICS AND COMMUNICATION ENGINEERING** can opt to study the courses listed below:

ELECTRONICS & COMMUNICATION ENGINEERING

SE ME STE R	GROUP I				GROUP II				GROUP III			
	COURS E NO.	COURSE NAME	H O U R S	C R E D I T	COURSE NO.	COURSE NAME	H O U R S	C R E D I T	COURSE NO.	COURSE NAME	H O U R S	C R E D I T
S4	ECT292	NANOELECTRO NICS	4	4	ECT294	STOCHASTIC PROCESSES FOR COMMUNICATION	4	4	ECT296	STOCHASTIC SIGNAL PROCESSING	4	4
S5	ECT393	FPGA BASED SYSTEM DESIGN	4	4	ECT395	DETECTION AND ESTIMATION THEORY	4	4	ECT397	COMPUTATI ONAL TOOLS FOR SIGNAL PROCESSING	4	4
S6	ECT394	ELECTRONIC DESIGN AND AUTOMATION TOOLS	4	4	ECT396	MIMO AND MULTIUSER COMMUNICATION SYSTEMS	4	4	ECT398	DETECTION AND ESTIMATION THEORY	4	4
S7	ECT495	RF MEMS	4	4	ECT497	DESIGN AND ANALYSIS OF ANTENNAS	4	4	ECT499	MULTIRATE SIGNAL PROCESSING AND WAVELETS	4	4
S8	ECD496	MINIPROJECT	4	4	ECD496	MINIPROJECT	4	4	ECD496	MINIPROJECT	4	4

INDUCTION PROGRAM

There will be three weeks induction program for first semester students. It is a unique three-week immersion Foundation Programme designed especially for the fresher's which includes a wide range of activities right from workshops, lectures and seminars to sports tournaments, social work and much more. The programme is designed to mould students into well-rounded individuals, aware and sensitized to local and global conditions and foster their creativity, inculcate values and ethics, and help students to discover their passion. Foundation Programme also serves as a platform for the fresher's to interact with their batchmates and seniors and start working as a team with them. The program is structured around the following five themes:

The programme is designed keeping in mind the following objectives:

- **Values and Ethics:** Focus on fostering a strong sense of ethical judgment and moral fortitude.
- **Creativity:** Provide channels to exhibit and develop individual creativity by expressing themselves through art, craft, music, singing, media, dramatics, and other creative activities.
- **Leadership, Communication and Teamwork:** Develop a culture of teamwork and group communication.
- **Social Awareness:** Nurture a deeper understanding of the local and global world and our place in it as concerned citizens of the world.

MAHATMA GANDHI UNIVERSITY



SCHEME AND SYLLABI
FOR
M.TECH DEGREE PROGRAMME
IN
ELECTRONICS AND COMMUNICATION ENGINEERING
WITH SPECIALIZATION IN
VLSI AND EMBEDDED SYSTEMS
(2013 ADMISSION ONWARDS)

SEMESTER III

Sl. No.	Course No.	Subject	Hrs / Week			Evaluation Scheme (Marks)					Credits (C)
			L	T	P	Sessional			ESE	Total	
						TA	CT	Sub Total			
1	MCPRM 301	Research Methodology	4	0	0	25	25	50	100	150	4
2	MECVE 302	Power Management of Embedded Systems	4	0	0	25	25	50	100	150	4
3	MECVE 303	Mini Project or Industrial Training	0	0	16	25	25	50	100	150	7
		Master's Thesis Phase - I	0	0	3	25	0	25	25	50	
					1						

SEMESTER IV

Sl. No	Course No.	Subject	Hrs / Week			Evaluation Scheme (Marks)					Credits (C)
			L	T	P	Sessional			ESE	Total	
						TA	CT	Sub Total			
1	MECVE 401	Master's Thesis	0	0	27	100	0	100	100	200	12
2	MECVE 402	Master's Comprehensive Viva	0	0	0	0	0	0	100	100	3
Total										300	15
Grand Total of four Semesters									3000	80	

CURRICULUM AND SYLLABUS
FOR
M. TECH DEGREE PROGRAMME
IN
VLSI AND EMBEDDED SYSTEMS
OFFERED BY
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING



CLUSTER 05 (ERNAKULAM II)
APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
CET Campus, Thiruvananthapuram
Kerala, India -695016

SCHEME

SEMESTER – I

<i>Exam Slot</i>	<i>Course No</i>	<i>Subjects</i>	<i>L-T-P</i>	<i>Internal Marks</i>	<i>End Semester Exam</i>		<i>Credits</i>
					Marks	Duration (hrs)	
A	05EC 6001	CMOS Analog Design	3-1-0	40	60	3	4
B	05EC 6003	CMOS Digital Design	3-1-0	40	60	3	4
C	05EC 6005	Advanced Digital Design	3-1-0	40	60	3	4
D	05EC 6007	Embedded Processors	2-1-0	40	60	3	3
E	05EC 601x	Elective 1	2-1-0	40	60	3	3
	05EC 6077	Research methodology	1-1-0	100	0	0	2
	05EC 6091	HDL Lab	0-0-2	100	0	0	1

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Elective – I	
Course No	Subjects
05EC 6011	FPGA Based System Design
05EC 6013	Modelling of Embedded Systems
05EC 6015	Semiconductor Device Physics and Modelling

L – Lecture, **T** – Tutorial, **P** – Practical

SEMESTER – II

<i>Exam Slot</i>	<i>Course No</i>	<i>Subjects</i>	<i>L-T-P</i>	<i>Internal Marks</i>	<i>End Semester Exam</i>		<i>Credits</i>
					Marks	Duration (hrs)	
A	05EC 6002	Mixed Signal VLSI Design	3-1-0	40	60	3	4
B	05EC 6004	Sensor Technologies and MEMS	2-1-0	40	60	3	3
C	05EC 6006	Embedded Real Time Systems	2-1-0	40	60	3	3
D	05EC 602x	Elective 2	2-1-0	40	60	3	3
E	05EC 603x	Elective 3	2-1-0	40	60	3	3
	05EC 6066	Seminar	0-0-2	100	0	0	2
	05EC 6088	Mini Project	0-0-4	100	0	0	2
	05EC 6092	Embedded Systems Lab	0-0-2	100	0	0	1

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Elective – II	
Course No	Subjects
05EC 6022	Design of Power Converters
05EC 6024	System Identification and System Simulation
05EC 6026	VLSI Process Technology

Elective – III	
Course No	Subjects
05EC 6032	High Speed Digital Design
05EC 6034	Low Power VLSI Design
05EC 6036	Nanomaterials, Structures and Devices

L – Lecture, T – Tutorial, P – Practical

SEMESTER – III

<i>Exam Slot</i>	<i>Course No</i>	<i>Subjects</i>	<i>L-T-P</i>	<i>Internal Marks</i>	<i>End Semester Exam</i>		<i>Credits</i>
					Marks	Duration(hrs)	
A	05EC 704x	Elective 4	2-1-0	40	60	3	3
B	05EC 705x	Elective 5	2-1-0	40	60	3	3
	05EC 7067	Seminar II	0-0-2	100	0	0	2
	05EC 7087	Project (Phase 1)	0-0-12	50	0	0	6

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Elective – IV	
Course No	Subjects
05EC 7041	Electromagnetic Compatibility
05EC 7043	Testing of VLSI Circuits
05EC 7045	VLSI Signal Processing
Elective – V	
Course No	Subjects
05EC 7051	VLSI and Computer Aided Design
05EC 7053	Hardware / Software Co-design
05EC 7055	Embedded Networking

SEESTER – IV

<i>Exam Slot</i>	<i>Course No</i>	<i>Subjects</i>	<i>L-T-P</i>	<i>Internal Marks</i>	<i>End Semester Exam</i>		<i>Credits</i>
					Marks	Duration(hrs)	
	05EC 7088	Project (Phase 2)	0-0-21	70	30	-	12



VISWAJYOTHI COLLEGE OF ENGINEERING & TECHNOLOGY

(Approved by AICTE, Affiliated to APJ Abdul Kalam Technological University, Kerala)

Vazhakulam P.O., Muvattupuzha, Ernakulam Dist., Kerala, India - 686 670

Ph: 0485 2262211, 2262244, 2262255, 2262977, Fax : 0485 2262211

Web : www.vjcet.ac.in E-mail : vjcet@vjcet.org, vjcvklm@gmail.com



All B.Tech Programmes (CE, CSE, ECE, EEE, IT & ME) Accredited by NBA

Date : 28/04/2021

Self Declaration

Subject: Reference to metric number 1.3.2. Experiential learning courses in the curriculum apart from Project work/ Internship/ field work

In Electrical and Electronics Engineering, for undergraduate programme, semesters from 1 to 6 consists of 8 courses out of which 2 are laboratory courses and semester 7 consists of 1 laboratory course as per APJ Abdul Kalam Technological University in addition to project work/Internships/Field work. In MG university, for undergraduate programme, semesters from 1 to 7 consists of 8 courses out of which 2 are laboratory courses and semester 8 consists of 1 laboratory course. In laboratory courses, students undergo experiential learning related to one or more theory courses. Thus each student goes through more than 30% of experiential learning in each semester.



Dr. K.K. Rajan
Principal

Viswajyothi College of Engineering & Technology
Vazhakulam P.O., Muvattupuzha, Kerala-686 670

Note: Sample copy of scheme and syllabus is enclosed along with this letter.

Mahatma Gandhi University Revised Scheme For
B Tech Syllabus Revision 2010

Electrical & Electronics Engineering.
Common for All Branches
SCHEME S1&S2

Code	Subject	Hours/week			Marks		End-sem duration- hours	Credits
		L	T	P/D	Internal	End-sem		
EN010 101	Engineering Mathematics I	2	1	-	50	100	3	5
EN010 102	Engineering Physics	1	1	-	50	100	3	4
EN010 103	Engineering. Chemistry & Environmental Studies	1	1	-	50	100	3	4
EN010 104	Engineering Mechanics	3	1	-	50	100	3	6
EN010 105	Engineering Graphics	1	3	-	50	100	3	6
EN010 106	Basic Civil Engineering	1	1	-	50	100	3	4
EN010 107	Basic Mechanical Engineering	1	1	-	50	100	3	4
EN010 108	Basic Electrical Engineering	1	1	-	50	100	3	4
EN010 109	Basic Electronics Engineering. & Information Technology	2	1	-	50	100	3	5
EN010 110	Mechanical Workshop	-	-	3	50	-	3	1
EN110 111	Electrical and Civil Workshops	-	-	3	100	-	3	1
	Total	13	11	6			30	44

3rd Semester

Code	Subject	Hours/week			Marks		End-sem duration	Credits
		L	T	P/D	Internal	End-sem		
EN010 301A	Engineering Mathematics II	2	2	-	50	100	3	4
EN010 302	Economics and Communication Skills	2	2	-	50	100	3	4 (3+1)
EE 010 303	Electric Circuit Theory	2	2	-	50	100	3	4
EE010 304	Electrical Measurements and Measuring Instruments	3	1	-	50	100	3	4
EE 010 305	Electronic Circuits	3	1	-	50	100	3	4
EE 010 306(ME)	Mechanical Technology	3	1	-	50	100	3	4
EE010 307	Electrical Measurements Lab	-	-	3	50	100	3	2
EE 010 308	Mechanical Lab	-	-	3	50	100	3	2
	Total	15	9	6				28

4th Semester

Code	Subject	Hours/week			Marks		End-sem duration -hours	Credits
		L	T	P/D	Internal	End-sem		
EN010 401	Engineering Mathematics III	2	2	-	50	100	3	4
EE 010 402	DC Machines and Transformers	3	1	-	50	100	3	4
EE 010 403	Linear System Analysis	2	2	-	50	100	3	4
EE010 404	Electromagnetic Theory	3	1	-	50	100	3	4
EE 010 405	Digital Systems and Computer Organization	3	1	-	50	100	3	4
EE 010 406	Computer Programming	3	1	-	50	100	3	4
EE 010 407	Computer Programming Lab			3	50	100	3	2
EE 010 408	Electronic Circuits Lab	-	-	3	50	100	3	2
	Total	16	8	6				28

5th Semester

Code	Subject	Hours/week			Marks		End-sem duration- hours	Credits
		L	T	P/D	Internal	End-sem		
EN010 501A	Engineering Mathematics IV	2	2	-	50	100	3	4
EN 010 502(ME)	Principles of Management	3	1		50	100	3	4
EE 010 503	Signals and Systems	2	2	-	50	100	3	4
EE010 504	Power Electronics	3	1	-	50	100	3	4
EE 010 505	Linear Integrated Circuits	3	1	-	50	100	3	4
EE 010 506	Microprocessors and Applications	3	1	-	50	100	3	4
EE010 507	Electrical Machines Lab I	-	-	3	50	100	3	2
EE010 508	Integrated Circuits Lab	-	-	3	50	100	3	2
	Total	16	8	6				28

6th Semester

Code	Subject	Hours/week			Marks		End-sem duration -hours	Credits
		L	T	P/D	Internal	End-sem		
EE 010 601	Power Generation and Distribution	2	2	-	50	100	3	4
EE 010 602	Induction Machines	3	1	-	50	100	3	4
EE 010 603	Control Systems	2	2	-	50	100	3	4
EE 010 604	Digital Signal Processing	3	1	-	50	100	3	4
EE 010 605	Microcontrollers and Embedded Systems	3	1	-	50	100	3	4
EE 010 606Lxx	Elective I	2	2	-	50	100	3	4
EE 010 607	Power Electronics Lab	-	-	3	50	100	3	2
EE 010 608	Microprocessor and Microcontroller Lab	-	-	3	50	100	3	2
	Total	15	9	6				28

Elective I

EE 010 606L01	High Voltage Engineering
EE 010 606L02	VLSI systems
EE 010 606L03	Artificial Neural Networks
EE 010 606L04	Object Oriented Programming
EE 010 606L05	Bio - medical engineering
EE 010 606L06	Renewable energy Sources

7th Semester

Code	Subject	Hours/week			Marks		End-sem duration -hours	Credits
		L	T	P/D	Internal	End-sem		
EN010 701	Electrical Power Transmission	2	2	-	50	100	3	4
EE 010 702	Synchronous Machines	2	1	-	50	100	3	4
EE010 703	Drives and Control	2	2	-	50	100	3	3
EE010 704	Modern Control Theory	2	1	-	50	100	3	3
EE010 705	Communication Engineering	2	1	-	50	100	3	3
EE 010 706Lxx	Elective II	2	2	-	50	100	3	4
EE010 707	Electrical CAD	-	-	3	50	100	3	2
EE 010 708	Control and Simulation Lab	-	-	3	50	100	3	2
EE010 709	Seminar	-	-	2	50	-	-	2
EE 010 710	Project	-	-	-	50	-	-	1
	Total	12	9	9				28

Elective II

EE010	706L01	H V D C Transmission
EE010	706L02	Industrial Instrumentation
EE010	706L03	Power Quality
EE010	706L04	PLC Based systems
EE010	706L05	MEMS Technology
EE010	706L06	Special Electrical Machines

8th Semester

Code	Subject	Hours/week			Marks		End-sem duration- hours	Credi ts
		L	T	P/D	Inte- rnal	End- sem		
EE010 801	Power System Analysis	2	2	-	50	100	3	4
EE010 802	Switch Gear and Protection	2	2	-	50	100	3	4
EE 010 803	Electrical System Design	3	2	-	50	100	3	4
EE010 804Lxx	Elective III	2	2	-	50	100	3	4
EE 010 805Gxx	Elective IV	2	2	-	50	100	3	4
EE 010 806	Electrical Machines Lab II	-	-	3	50	100	3	2
EE010 807	Project	-	-	6	100	-	-	4
EE 010 808	Viva Voce	-	-	-	-	50	-	2
	Total	11	10	9				28

Electives III

EE010	804L01	Advanced Power System
EE010	804L02	Computer Networks
EE010	804L03	Generalized Machine Theory
EE010	804L04	Finite Element applications in Electrical Engineering.
EE010	804L05	Digital Signal Processors
EE010	804L06	Opto Electronics

Electives IV

EE010	805G01	Soft Computing Techniques
EE010	805G02	Intellectual property rights
EE010	805G03	Advanced Mathematics
EE010	805G04	Virtual Instrumentation
EE010	805G05	Digital Image Processing
EE010	805G06	Distributed Power Systems



KERALA TECHNOLOGICAL UNIVERSITY

Curriculum for Semesters I and II

2015

Kerala Technological University
CET Campus, Thiruvananthapuram
Kerala -695016 India
Phone +91 471 2598122, 2598422
Fax +91 471 2598522
Web: ktu.edu.in
Email: university@ktu.edu.in

SEMESTER I

Slot	Course No.	Subject	L-T-P	Hours	Credits
A	MA101	Calculus	3-1-0	4	4
B (1/2)	PH100	Engineering Physics	3-1-0	4	4
	CY100	Engineering Chemistry	3-1-0	4	4
C (1/2)	BE100	Engineering Mechanics	3-1-0	4	4
	BE110	Engineering Graphics	1-1-2	4	3
D	BE101-0X	Introduction to _____ Engineering	2-1-0	3	3
E	BE103	Introduction to Sustainable Engineering	2-0-1	3	3
F (1/4)	CE100	Basics of Civil Engineering	2-1-0	3	3
	ME100	Basics of Mechanical Engineering	2-1-0	3	3
	EE100	Basics of Electrical Engineering	2-1-0	3	3
	EC100	Basics of Electronics Engineering	2-1-0	3	3
S (1/2)	PH110	Engineering Physics Lab	0-0-2	2	1
	CY110	Engineering Chemistry Lab	0-0-2	2	1
T (2/4)	CE110/ME110/ EE110/EC110/ CS110/CH110	Basic Engineering Workshops (CS110 for CS and related branches and CH110 for CH and related branches only)	0-0-2 + 0-0-2	2 2	1 1
U		U100 Language lab/ Bridge courses/ Remedial programmes/Micro Projects etc	0-0-3	3	
				30	24/23
V		V100 Entrepreneurship/TBI/NCC/NSS/ Physical Edn. etc	0-0-2	2	Activity points

SEMESTER II

Slot	Course No.	Subject	L-T-P	Hours	Credits
A	MA102	Differential Equations	3-1-0	4	4
B (1/2)	PH100	Engineering Physics	3-1-0	4	4
	CY100	Engineering Chemistry	3-1-0	4	4
C (1/2)	BE100	Engineering Mechanics	3-1-0	4	4
	BE110	Engineering Graphics	1-1-2	4	3
D	BE102	Design & Engineering	2-0-2	4	3
E, F (2/4)	CE 100	Basics of Civil Engineering	2-1-0	3	3
	ME 100	Basics of Mechanical Engineering	2-1-0	3	3
	EE 100	Basics of Electrical Engineering	2-1-0	3	3
	EC 100	Basics of Electronics Engineering	2-1-0	3	3
S (1/2)	PH110	Engineering Physics Lab	0-0-2	2	1
	CY110	Engineering Chemistry Lab	0-0-2	2	1
T (2/4)	CE110/ME110/ EE110/EC110	Basic Engineering Workshops	0-0-2	2	1
			+ 0-0-2	2	1
U		U100 Language lab / Bridge courses/ Remedial programmes/Micro Projects etc	0-0-2	2	
				30	24/23
V		V100 Entrepreneurship /TBI/NCC/NSS/ Physical Edn. etc	0-0-2	2	Activity points

Note: 1. Institutions can assign **two of four** Basics of Engineering courses not already taken by the student in the previous semester and the corresponding Workshop courses in Semester 2.



APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

**Curriculum
for
B.Tech Degree
Semesters III to VIII
2016
Electrical and Electronics Engineering**

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

CET CAMPUS, THIRUVANANTHAPURAM – 695016

KERALA, INDIA

Phone +91 471 2598122, 2598422

Fax +91 471 2598522 Web: ktu.edu.in

Email: university@ktu.edu.in

BRANCH: *Electrical & Electronics Engineering***SEMESTER - 3**

Course Code	Course Name	L-T-P	Credits	Exam Slot
MA201	Linear Algebra & Complex Analysis	3-1-0	4	A
EE201	Circuits and, Networks	3-1-0	4	B
EE203	Analog Electronic Circuits	3-1-0	4	C
EE205	DC Machines and Transformers	3-1-0	4	D
EE207	Computer Programming	2-1-0	3	E
HS200/ HS210	Business Economics/Life Skills	3-0-0/ 2-0-2	3	F
EE231	Electronic Circuits Lab	0-0-3	1	S
EE233	Programming Lab	0-0-3	1	T

Total Credits = 24 Hours: 28/29 Cumulative Credits= 71**SEMESTER - 4**

Course Code	Course Name	L-T-P	Credits	Exam Slot
MA202	Probability Distributions, Transforms and Numerical Methods	3-1-0	4	A
EE202	Synchronous and Induction Machines	3-1-0	4	B
EE204	Digital Electronics and Logic Design	2-1-0	3	C
EE206	Material Science	3-0-0	3	D
EE208	Measurements and Instrumentation	3-1-0	4	E
HS210/ HS200	Life Skills/Business Economics	2-0-2/ 3-0-0	3	F
EE232	Electrical Machines Lab I	0-0-3	1	S
EE234	Circuits and Measurements Lab	0-0-3	1	T

Total Credits = 23 Hours 28/27 Cumulative Credits= 94

BRANCH: *Electrical & Electronics Engineering*

SEMESTER - 5

Course Code	Course Name	L-T-P	Credits	Exam Slot
EE301	Power Generation, Transmission and Protection	3-1-0	4	A
EE303	Linear Control Systems	2-1-0	3	B
EE305	Power Electronics	3-0-0	3	C
EE307	Signals and Systems	3-0-0	3	D
EE309	Microprocessor and Embedded Systems	2-1-0	3	E
	Elective 1	3-0-0	3	F
EE341	Design Project	0-1-2	2	S
EE331	Digital Circuits and Embedded Systems Lab	0-0-3	1	T
EE333	Electrical Machines Lab II	0-0-3	1	U

Total Credits = 23**Hours: 28****Cumulative Credits= 117**

- Elective 1:-**
1. EE361 Object Oriented Programming
 2. EE363 Computer Organization and Architecture
 3. EE365 Digital System Design
 4. EE367 New and Renewable Energy Systems
 5. EE369 High Voltage Engineering

BRANCH: *Electrical & Electronics Engineering***SEMESTER - 6**

Course Code	Course Name	L-T-P	Credits	Exam Slot
EE302	Electromagnetics	2-1-0	3	A
EE304	Advanced Control Theory	3-1-0	4	B
EE306	Power System Analysis	3-0-0	3	C
EE308	Electric Drives	3-0-0	3	D
HS300	Principles of Management	3-0-0	3	E
	Elective 2	3-0-0	3	F
EE332	Systems and Control Lab	0-0-3	1	S
EE334	Power Electronics and Drives Lab	0-0-3	1	T
EE352	Comprehensive Exam	0-1-1	2	U

Total Credits = 23**Hours: 27****Cumulative Credits= 140****Elective 2:-**

1. EE362 Data Structures and Algorithms
2. EE364 Switched Mode Power Converters
3. EE366 Illumination Technology
4. EE368 Soft Computing
5. EE372 Biomedical Instrumentation

BRANCH: *Electrical & Electronics Engineering***SEMESTER - 7**

Course Code	Course Name	L-T-P	Credits	Exam Slot
EE401	Electronic communication	2-1-0	3	A
EE403	Distributed generation and smart grids	3-0-0	3	B
EE405	Electrical system design	3-1-0	4	C
EE407	Digital Signal Processing	3-0-0	3	D
EE409	Electrical Machine Design	3-0-0	3	E
	Elective 3	3-0-0	3	F
EE451	Seminar & Project Preliminary	0-1-4	2	S
EE431	Power system Lab	0-0-3	1	T

Total Credits = 22**Hours: 27Cumulative Credits= 162****Elective 3:-**

1. EE461 Modern Operating Systems
2. EE463 Computer Aided Power Systems Analysis
3. EE465 Power Quality
4. EE467 Nonlinear Control Systems
5. EE469 Electric and Hybrid Vehicles

BRANCH: *Electrical & Electronics Engineering*

SEMESTER - 8


Course Code	Course Name	L-T-P	Credits	Exam Slot
EE402	Special Electric Machines	3-0-0	3	A
EE404	Industrial Instrumentation & Automation	3-0-0	3	B
	Elective 4	3-0-0	3	C
	Elective 5 (Non Departmental)	3-0-0	3	D
EE492	Project		6	S

Total Credits = 18**Hours: 29****Cumulative Credits= 180****Elective 4:-**

1. EE462 Design of Digital Control Systems
2. EE464 FACTS
3. EE466 Digital Image Processing
4. EE468 Computer Networks
5. EE472 Internet of Things
6. EE474 Energy Management and Auditing

ELECTIVE 5 (NON DEPARTMENTAL ELECTIVE COURSES)

(Note:- If a student has studied or chosen the elective course given within the brackets then the corresponding ND elective cannot be chosen)

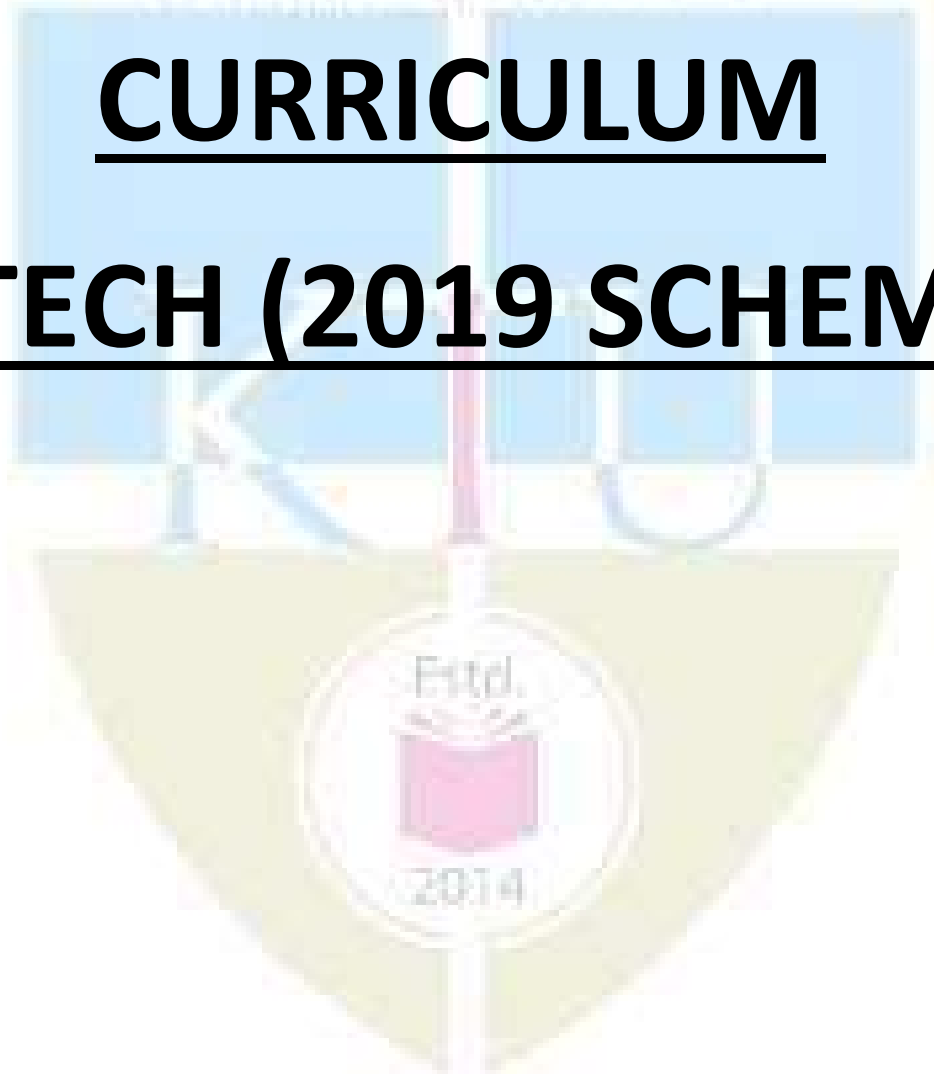
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1. AO482 FLIGHT AGAINST GRAVITY
2. AE484 INSTRUMENTATION SYSTEM DESIGN
3. AU486 NOISE, VIBRATION AND HARSHNESS
4. BM482 BIOMEDICAL INSTRUMENTATION (EE 372 BIOMEDICAL INSTRUMENTATION)
5. BM484 MEDICAL IMAGING & IMAGE PROCESSING TECHNIQUES
6. BT461 DESIGN OF BIOLOGICAL WASTEWATER SYSTEMS
7. BT362 SUSTAINABLE ENERGY PROCESSES
8. CH482 PROCESS UTILITIES AND PIPE LINE DESIGN
9. CH484 FUEL CELL TECHNOLOGY
10. CE482 ENVIRONMENTAL IMPACT ASSESSMENT
11. CE484 APPLIED EARTH SYSTEMS
12. CE486 GEO INFORMATICS FOR INFRASTRUCTURE MANAGEMENT
13. CE488 DISASTER MANAGEMENT
14. CE494 ENVIRONMENT HEALTH AND SAFETY
15. CS482 DATA STRUCTURES (EE 362 DATA STRUCTURES AND ALGORITHMS)
16. CS484 COMPUTER GRAPHICS
17. CS486 OBJECT ORIENTED PROGRAMMING (EE 361 OBJECT ORIENTED PROGRAMMING)
18. CS488 C # AND .NET PROGRAMMING
19. EC482 BIOMEDICAL ENGINEERING
20. FT482 FOOD PROCESS ENGINEERING
21. FT484 FOOD STORAGE ENGINEERING

22. FT486	FOOD ADDITIVES AND FLAVOURING
23.IE482	FINANCIAL MANAGEMENT
24. IE484	INTRODUCTION TO BUSINESS ANALYTICS
25.IE486	DESIGN AND ANALYSIS OF EXPERIMENTS
26. IE488	TOTAL QUALITY MANAGEMENT
27.IC482	BIOMEDICAL SIGNAL PROCESSING
28. IT482	INFORMATION STORAGE MANAGEMENT
29. MA482	APPLIED LINEAR ALGEBRA
30. MA484	OPERATIONS RESEARCH
31. MA486	ADVANCED NUMERICAL COMPUTATIONS
32. MA488	CRYPTOGRAPHY
33.ME484	FINITE ELEMENT ANALYSIS
34.ME482	ENERGY CONSERVATION AND MANAGEMENT (EE474 ENERGY MANAGEMENT AND AUDITING)
35.ME471	OPTIMIZATION TECHNIQUES
36.MP482	PRODUCT DEVELOPMENT AND DESIGN
37. MP469	INDUSTRIAL PSYCHOLOGY & ORGANIZATIONAL BEHAVIOUR
38. MP484	PROJECT MANAGEMENT
39. MT482	INDUSTRIAL SAFETY
40. MR482	MECHATRONICS
41. FS482	RESPONSIBLE ENGINEERING
42. SB482	DREDGERS AND HARBOUR CRAFTS
43. HS482	PROFESSIONAL ETHICS

AMU ABDUL KALAM
TECHNOLOGICAL
UNIVERSITY

CURRICULUM

B.TECH (2019 SCHEME)



CURRICULUM I TO VIII: ELECTRICAL & ELECTRONICS ENGINEERING

Every course of B. Tech. Program shall be placed in one of the nine categories as listed in table below.

Sl. No	Category	Code	Credits
1	Humanities and Social Sciences including Management courses	HMC	8
2	Basic Science courses	BSC	26
3	Engineering Science Courses	ESC	22
4	Program Core Courses	PCC	76
5	Program Elective Courses	PEC	15
6	Open Elective Courses	OEC	3
7	Project work and Seminar	PWS	10
8	Mandatory Non-credit Courses (P/F) with grade	MNC	-----
9	Mandatory Student Activities (P/F)	MSA	2
	Total Mandatory Credits		162
10	Value Added Course (Optional)	VAC	20

No semester shall have more than six lecture-based courses and two laboratory and/or drawing/seminar/project courses in the curriculum. Semester-wise credit distribution shall be as below:

Sem	1	2	3	4	5	6	7	8	Total
Credits	17	21	22	22	23	23	15	17	160
Activity Points	50				50				---
Credits for Activity	2								2
G.Total									162

ELECTRICAL & ELECTRONICS ENGINEERING

Basic Science Courses: Maths, Physics, Chemistry, Biology for Engineers, Life Science etc

Engineering science courses: Basic Electrical, Engineering Graphics, Programming, Workshop, Basic Electronics, Basic Civil, Engineering Mechanics, Mechanical Engineering, Thermodynamics, Design Engineering, Materials Engineering etc.

Humanities and Social Sciences including Management courses: English, Humanities, Professional Ethics, Management, Finance & Accounting, Life Skills, Professional Communication, Economics etc

Mandatory non-credit courses: Sustainable Engineering, Constitution of India/Essence of Indian Knowledge Tradition, Industrial Safety Engineering, disaster management etc.

Course Code and Course Number

Each course is denoted by a unique code consisting of three alphabets followed by three numerals like **E C L 2 0 1**. The first two letter code refers to the department offering the course. EC stands for course in Electronics & Communication, course code MA refers to a course in Mathematics, course code ES refers to a course in Engineering Science etc. Third letter stands for the nature of the course as indicated in the Table 1.

Table 1: Code for the courses

Code	Description
T	Theory based courses (other the lecture hours, these courses can have tutorial and practical hours, e.g., L-T-P structures 3-0-0, 3-1-2, 3-0-2 etc.)
L	Laboratory based courses (where performance is evaluated primarily on the basis of practical or laboratory work with LTP structures like 0-0-3, 1-0-3, 0-1-3 etc.)
N	Non-credit courses
D	Project based courses (Major, Mini Projects)
Q	Seminar Courses

Course Number is a three digit number and the first digit refers to the Academic year in which the course is normally offered, i.e. 1, 2, 3, or 4 for the B. Tech. Programme of four year duration. Of the other two digits, the last digit identifies whether the course is offered normally in the odd (odd number), even (even number) or in both the semesters (zero). The middle number could be any digit. ECL 201 is a laboratory course offered in EC department for third semester, MAT 101 is a course in Mathematics offered in the first semester, EET 344 is a course in Electrical Engineering offered in the sixth semester, PHT 110 is a course in Physics offered both the first and second semesters, EST 102 is a course in Basic Engineering offered by one or many departments. These course numbers are to be given in the curriculum and syllabi.

Departments

Each course is offered by a Department and their two-letter course prefix is given in Table 2.

Table 2: Departments and their codes

Sl.No	Department	Course Prefix	Sl.No	Department	Course Prefix
01	Aeronautical Engg	AO	16	Information Technology	IT
02	Applied Electronics & Instrumentation	AE	17	Instrumentation & Control	IC
03	Automobile	AU	18	Mandatory Courses	MC
04	Biomedical Engg	BM	19	Mathematics	MA
05	Biotechnology	BT	20	Mechanical Engg	ME
06	Chemical Engg	CH	21	Mechatronics	MR
07	Chemistry	CY	22	Metallurgy	MT
08	Civil Engg	CE	23	Mechanical (Auto)	MU
09	Computer Science	CS	24	Mechanical(Prod)	MP
10	Electrical & Electronics	EE	25	Naval & Ship Building	SB
11	Electronics & Biomedical	EB	26	Physics	PH
12	Electronics & Communication	EC	27	Polymer Engg	PO
13	Food Technology	FT	28	Production Engg	PE
14	Humanities	HU	29	Robotics and Automation	RA
15	Industrial Engg	IE	30	Safety & Fire Engg	FS

ELECTRICAL & ELECTRONICS ENGINEERING

SEMESTER I

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	MAT 101	LINEAR ALGEBRA AND CALCULUS	3-1-0	4	4
B 1/2	PHT 100	ENGINEERING PHYSICS A	3-1-0	4	4
	CYT 100	ENGINEERING CHEMISTRY	3-1-0	4	4
C 1/2	EST 100	ENGINEERING MECHANICS	2-1-0	3	3
	EST 110	ENGINEERING GRAPHICS	2-0-2	4	3
D 1/2	EST 120	BASICS OF CIVIL & MECHANICAL ENGINEERING	4-0-0	4	4
	EST 130	BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING	4-0-0	4	4
E	HUT 101	LIFE SKILLS	2-0-2	4	--
S 1/2	PHL 120	ENGINEERING PHYSICS LAB	0-0-2	2	1
	CYL 120	ENGINEERING CHEMISTRY LAB	0-0-2	2	1
T 1/2	ESL 120	CIVIL & MECHANICAL WORKSHOP	0-0-2	2	1
	ESL 130	ELECTRICAL & ELECTRONICS WORKSHOP	0-0-2	2	1
TOTAL				23/24 *	17

*Minimum hours per week

Note: To make up for the hours lost due to induction program, one extra hour may be allotted to each course

ELECTRICAL & ELECTRONICS ENGINEERING

SEMESTER II

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	MAT 102	VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TRANSFORMS	3-1-0	4	4
B 1/2	PHT 100	ENGINEERING PHYSICS A	3-1-0	4	4
	CYT 100	ENGINEERING CHEMISTRY	3-1-0	4	4
C 1/2	EST 100	ENGINEERING MECHANICS	2-1-0	3	3
	EST 110	ENGINEERING GRAPHICS	2-0-2	4	3
D 1/2	EST 120	BASICS OF CIVIL & MECHANICAL ENGINEERING	4-0-0	4	4
	EST 130	BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING	4-0-0	4	4
E	HUT 102	PROFESSIONAL COMMUNICATION	2-0-2	4	--
F	EST 102	PROGRAMMING IN C	2-1-2	5	4
S 1/2	PHL 120	ENGINEERING PHYSICS LAB	0-0-2	2	1
	CYL 120	ENGINEERING CHEMISTRY LAB	0-0-2	2	1
T 1/2	ESL 120	CIVIL & MECHANICAL WORKSHOP	0-0-2	2	1
	ESL 130	ELECTRICAL & ELECTRONICS WORKSHOP	0-0-2	2	1
TOTAL				28/29	21

NOTE:

1. Engineering Physics A and Engineering Chemistry shall be offered in both semesters. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Engineering Physics A in S1 and Engineering Chemistry in S2 & vice versa. Students opting for Engineering Physics A in a semester should attend Physics Lab in the same semester and students opting for Engineering Chemistry in one semester should attend Engineering Chemistry Lab in the same semester.
2. Engineering Mechanics and Engineering Graphics shall be offered in both semesters. Institutions can advise students belonging to about 50% of the number of branches

ELECTRICAL & ELECTRONICS ENGINEERING

in the Institution to opt for Engineering Mechanics in S1 and Engineering Graphics in S2 & vice versa.

3. Basics of Civil & Mechanical Engineering and Basics of Electrical & Electronics Engineering shall be offered in both semesters. Basics of Civil & Mechanical Engineering contain equal weightage for Civil Engineering and Mechanical Engineering. Slot for the course is D with CIE marks of 25 each and ESE marks of 50 each. Students belonging to branches of AEI, EI, BME, ECE, EEE, ICE, CSE, IT, RA can choose this course in S1.

Basics of Electrical & Electronics Engineering contain equal weightage for Electrical Engineering and Electronics Engineering. Slot for the course is D with CIE marks of 25 each and ESE marks of 50 each. Students belonging to AERO, AUTO, CE, FSE, IE, ME, MECHATRONICS, PE, METTULURGY, BT, BCE, CHEM, FT, POLY can choose this course in S1. Students having Basics of Civil & Mechanical Engineering in one semester should attend Civil & Mechanical Workshop in the same semester and students having Basics of Electrical & Electronics Engineering in a semester should attend Electrical & Electronics Workshop in the same semester.

4. LIFE SKILLS

Life skills are those competencies that provide the means for an individual to be resourceful and positive while taking on life's vicissitudes. Development of one's personality by being aware of the self, connecting with others, reflecting on the abstract and the concrete, leading and generating change, and staying rooted in time-tested values and principles is being aimed at. This course is designed to enhance the employability and maximize the potential of the students by introducing them to the principles that underlie personal and professional success, and help them acquire the skills needed to apply these principles in their lives and careers.

5. PROFESSIONAL COMMUNICATION

Objective is to develop in the under-graduate students of engineering a level of competence in English required for independent and effective communication for their professional needs. Coverage: Listening, Barriers to listening, Steps to overcome them, Purposive listening practice, Use of technology in the professional world. Speaking, Fluency & accuracy in speech, Positive thinking, Improving self-expression, Tonal variations, Group discussion practice, Reading, Speed reading practice, Use of extensive readers, Analytical and critical reading practice, Writing Professional Correspondence, Formal and informal letters, Tone in formal writing, Introduction to reports. Study Skills, Use of dictionary, thesaurus etc., Importance of contents page, cover & back pages, Bibliography, Language Lab.

ELECTRICAL & ELECTRONICS ENGINEERING

SEMESTER III

SLOT	COURSE NO	COURSES	L-T-P	HOURS	CREDIT
A	MAT201	PARTIAL DIFFERENTIAL EQUATION AND COMPLEX ANALYSIS	3-1-0	4	4
B	EET201	CIRCUITS AND NETWORKS	2-2-0	4	4
C	EET203	MEASUREMENTS AND INSTRUMENTATION	3-1-0	4	4
D	EET205	ANALOG ELECTRONICS	3-1-0	4	4
E 1/2	EST200	DESIGN & ENGINEERING	2-0-0	2	2
	HUT200	PROFESSIONAL ETHICS	2-0-0	2	2
F	MCN201	SUSTAINABLE ENGINEERING	2-0-0	2	--
S	EEL201	CIRCUITS AND MEASUREMENTS LAB	0-0-3	3	2
T	EEL203	ANALOG ELECTRONICS LAB	0-0-3	3	2
R/M	VAC	REMEDIAL/MINOR COURSE	3-1-0	4 *	4
TOTAL				26/30	22/26

NOTE:

1. Design & Engineering and Professional Ethics shall be offered in both S3 and S4. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Design & Engineering in S3 and Professional Ethics in S4 & vice versa.
2. *All Institutions shall keep 4 hours exclusively for Remedial class/Minor course (Thursdays from 3 to 5 PM and Fridays from 2 to 4 PM). If a student does not opt for minor programme, he/she can be given remedial class.

SEMESTER IV

SLOT	COURSE NO	COURSES	L-T-P	HOURS	CREDIT
A	MAT 204	PROBABILITY, RANDOM PROCESSES AND NUMERICAL METHODS	3-1-0	4	4
B	EET202	DC MACHINES AND TRANSFORMERS	2-2-0	4	4
C	EET204	ELECTROMAGNETIC THEORY	3-1-0	4	4
D	EET206	DIGITAL ELECTRONICS	3-1-0	4	4
E 1/2	EST200	DESIGN & ENGINEERING	2-0-0	2	2
	HUT200	PROFESSIONAL ETHICS	2-0-0	2	2
F	MCN202	CONSTITUTION OF INDIA	2-0-0	2	--
S	EEL202	ELECTRICAL MACHINES LAB I	0-0-3	3	2
T	EEL204	DIGITAL ELECTRONICS LAB	0-0-3	3	2
R/M/H	VAC	REMEDIAL/MINOR/HONOURS COURSE	3-1-0	4*	4
TOTAL				26/30	22/26

NOTE:

- Design & Engineering and Professional Ethics shall be offered in both S3 and S4. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Design & Engineering in S3 and Professional Ethics in S4 & vice versa.
- *All Institutions should keep 4 hours exclusively for Remedial class/Minor course (Thursdays from 3 to 5 PM and Fridays from 2 to 4 PM). If a student doesnot opt for minor programme, he/she can be given remedial class.

ELECTRICAL & ELECTRONICS ENGINEERING

SEMESTER V

SLOT	COURSE NO	COURSES	L-T-P	HOURS	CREDIT
A	EET301	POWER SYSTEMS I	3-1-0	4	4
B	EET303	MICROPROCESSORS AND MICROCONTROLLERS	3-1-0	4	4
C	EET305	SIGNALS AND SYSTEMS	3-1-0	4	4
D	EET307	SYNCHRONOUS AND INDUCTION MACHINES	3-1-0	4	4
E 1/2	HUT300	INDUSTRIAL ECONOMICS & FOREIGN TRADE	3-0-0	3	3
	HUT310	MANAGEMENT FOR ENGINEERS	3-0-0	3	3
F	MCN301	DISASTER MANAGEMENT	2-0-0	2	--
S	EEL331	MICROPROCESSORS AND MICROCONTROLLERS LAB	0-0-3	3	2
T	EEL333	ELECTRICAL MACHINES LAB II	0-0-3	3	2
R/M/H	VAC	REMEDIAL/MINOR/HONOURS COURSE	3-1-0	4*	4
TOTAL				27/31	23/27

NOTE:

1. Industrial Economics & Foreign Trade and Management for Engineers shall be offered in both S5 and S6. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Industrial Economics & Foreign Trade in S5 and Management for Engineers in S6 and vice versa.
2. *All Institutions should keep 4 hours exclusively for Remedial class/Minor/Honours course (Tuesdays from 3 to 5 PM and Wednesdays from 3 to 5 PM). If a student does not opt for minor/honours programme, he/she can be given remedial class.

ELECTRICAL & ELECTRONICS ENGINEERING

SEMESTER VI

SLOT	COURSE NO	COURSES	L-T-P	HOURS	CREDIT
A	EET302	LINEAR CONTROL SYSTEMS	2-2-0	4	4
B	EET304	POWER SYSTEMS II	3-1-0	4	4
C	EET306	POWER ELECTRONICS	3-1-0	4	4
D	EETXXX	PROGRAM ELECTIVE I	2-1-0	3	3
E 1/2	HUT300	INDUSTRIAL ECONOMICS & FOREIGN TRADE	3-0-0	3	3
	HUT310	MANAGEMENT FOR ENGINEERS	3-0-0	3	3
F	EET308	COMPREHENSIVE COURSE WORK	1-0-0	1	1
S	EEL332	POWER SYSTEMS LAB	0-0-3	3	2
T	EEL334	POWER ELECTRONICS LAB	0-0-3	3	2
R/M/H	VAC	REMEDIAL/MINOR/HONOURS COURSE	3-1-0	4*	4
TOTAL				28/32	23/27

PROGRAM ELECTIVE I

SLOT	COURSE NO	COURSES	L-T-P	HOURS	CREDIT
D	EET312	BIOMEDICAL INSTRUMENTATION	2-1-0	3	3
	EET322	RENEWABLE ENERGY SYSTEMS	2-1-0		
	EET332	COMPUTER ORGANIZATION	2-1-0		
	EET342	HIGH VOLTAGE ENGINEERING	2-1-0		
	EET352	OBJECT ORIENTED PROGRAMMING	2-1-0		
	EET362	MATERIAL SCIENCE	2-1-0		
	EET372	SOFT COMPUTING	2-1-0		

NOTE:

1. Industrial Economics & Foreign Trade and Management for Engineers shall be offered in both S5 and S6. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Industrial Economics & Foreign Trade in S5 and Management for Engineers in S6 and vice versa.

ELECTRICAL & ELECTRONICS ENGINEERING

2. *All Institutions should keep 4 hours exclusively for Remedial class/Minor/Honours course (Tuesdays from 3 to 5 PM and Wednesdays from 2 to 4 PM). If a student does not opt for minor/honours programme, he/she can be given remedial class.
3. Comprehensive Course Work: The comprehensive course work in the sixth semester of study shall have a written test of 50 marks. The written examination will be of objective type similar to the GATE examination and will be conducted by the University. **Syllabus for comprehensive examination shall be prepared by the respective BoS choosing any 5 core courses studied from semester 3 to 5.** The pass minimum for this course is 25. The course should be mapped with a faculty and classes shall be arranged for practising questions based on the core courses listed in the curriculum.



ELECTRICAL & ELECTRONICS ENGINEERING

SEMESTER VII

SLOT	COURSE NO	COURSES	L-T-P	HOURS	CREDIT
A	EET401	ADVANCED CONTROL SYSTEMS	2-1-0	3	3
B	EETXXX	PROGRAM ELECTIVE II	2-1-0	3	3
C	EETXXX	OPEN ELECTIVE	2-1-0	3	3
D	MCN401	INDUSTRIAL SAFETY ENGINEERING	2-1-0	3	---
S	EEL411	CONTROL SYSTEMS LAB	0-0-3	3	2
T	EEQ413	SEMINAR	0-0-3	3	2
U	EED415	PROJECT PHASE I	0-0-6	6	2
R/M/H	VAC	REMEDIAL/MINOR/HONOURS COURSE	3-1-0	4*	4
TOTAL				24/28	15/19

PROGRAM ELECTIVE II

SLOT	COURSE NO	COURSES	L-T-P	HOURS	CREDIT
B	EET413	ELECTRIC DRIVES	2-1-0	3	3
	EET423	DIGITAL CONTROL SYSTEMS	2-1-0		
	EET433	MODERN OPERATING SYSTEMS	2-1-0		
	EET443	DATA STRUCTURES	2-1-0		
	EET453	DIGITAL SIGNAL PROCESSING	2-1-0		
	EET463	ILLUMINATION TECHNOLOGY	2-1-0		
	EET473	DIGITAL PROTECTION OF POWER SYSTEMS	2-1-0		

OPEN ELECTIVES

The open elective is offered in semester 7. Each program should specify the courses (maximum 5) they would like to offer as electives for other programs. For example the courses listed below are offered by the **Department of ELECTRICAL & ELECTRONICS ENGINEERING** for students of other undergraduate branches offered in the college under KTU.

ELECTRICAL & ELECTRONICS ENGINEERING

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
C	EET415	CONTROL SYSTEMS ENGINEERING	2-1-0	3	3
	EET425	INTRODUCTION TO POWER PROCESSING	2-1-0		
	EET435	RENEWABLE ENERGY SYSTEMS	2-1-0		
	EET445	ELECTRIC VEHICLES	2-1-0		
	EET455	ENERGY MANAGEMENT	2-1-0		

NOTE:

1. *All Institutions should keep 4 hours exclusively for Remedial class/Minor/Honours course (Mondays from 10 to 12 and Wednesdays from 10 to 12 Noon). If a student does not opt for minor/honours programme, he/she can be given remedial class.

2. Seminar: To encourage and motivate the students to read and collect recent and reliable information from their area of interest confined to the relevant discipline from technical publications including peer reviewed journals, conference, books, project reports etc., prepare a report based on a central theme and present it before a peer audience. Each student shall present the seminar for about 20 minutes duration on the selected topic. The report and the presentation shall be evaluated by a team of faculty members comprising Academic coordinator for that program, seminar coordinator and seminar guide based on style of presentation, technical content, adequacy of references, depth of knowledge and overall quality of the report.

Total marks: 100, only CIE, minimum required to pass 50

Attendance : 10

Guide : 20

Technical Content of the Report : 30

Presentation : 40

3. Project Phase I: A Project topic must be selected either from research literature or the students themselves may propose suitable topics in consultation with their guides. The object of Project Work I is to enable the student to take up investigative study in the broad field of Electrical & Electronics Engineering, either fully theoretical/practical or involving both theoretical and practical work to be assigned by the Department on a group of three/four students, under the guidance of a Supervisor. This is expected to provide a good initiation for the student(s) in R&D work. The assignment to normally include:

- Survey and study of published literature on the assigned topic;
- Preparing an Action Plan for conducting the investigation, including team work;
- Working out a preliminary Approach to the Problem relating to the assigned topic;
- Block level design documentation

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- Conducting preliminary Analysis/ Modelling/ Simulation/ Experiment/ Design/ Feasibility;
- Preparing a Written Report on the Study conducted for presentation to the Department;
- Final Seminar, as oral Presentation before the evaluation committee.

Total marks: 100, only CIE, minimum required to pass 50

Guide :30

Interim evaluation by the evaluation committee :20

Final Seminar :30

The report evaluated by the evaluation committee :20

The evaluation committee comprises HoD or a senior faculty member, Project coordinator and project supervisor.



ELECTRICAL & ELECTRONICS ENGINEERING

SEMESTER VIII

SLOT	COURSE NO	COURSES	L-T-P	HOURS	CREDIT
A	EET402	ELECTRICAL SYSTEM DESIGN AND ESTIMATION	2-1-0	3	3
B	EETXXX	PROGRAM ELECTIVE III	2-1-0	3	3
C	EETXXX	PROGRAM ELECTIVE IV	2-1-0	3	3
D	EETXXX	PROGRAM ELECTIVE V	2-1-0	3	3
T	EET404	COMPREHENSIVE COURSE VIVA	1-0-0	1	1
U	EED416	PROJECT PHASE II	0-0-12	12	4
R/M/H	VAC	REMEDIAL/MINOR/HONOURS COURSE	3-1-0	4*	4
TOTAL				25/29	17/21

PROGRAM ELECTIVE III

SLOT	COURSE NO	COURSES	L-T-P	HOURS	CREDIT
B	EET414	ROBOTICS	2-1-0	3	3
	EET424	ENERGY MANAGEMENT	2-1-0		
	EET434	SMART GRID TECHNOLOGIES	2-1-0		
	EET444	ELECTRICAL MACHINE DESIGN	2-1-0		
	EET454	SWITCHED MODE POWER CONVERTERS	2-1-0		
	EET464	COMPUTER AIDED POWER SYSTEM ANALYSIS	2-1-0		
	EET474	MACHINE LEARNING	2-1-0		

PROGRAM ELECTIVE IV

SLOT	COURSE NO	COURSES	L-T-P	HOURS	CREDIT
C	EET416	NONLINEAR SYSTEMS	2-1-0	3	3
	EET426	SPECIAL ELECTRIC MACHINES	2-1-0		
	EET436	POWER QUALITY	2-1-0		
	EET446	COMPUTER NETWORKS	2-1-0		
	EET456	DESIGN OF POWER ELECTRONIC SYSTEMS	2-1-0		
	EET466	HVDC & FACTS	2-1-0		
	EET476	ADVANCED ELECTRONIC DESIGN	2-1-0		

PROGRAM ELECTIVE V

SLOT	COURSE NO	COURSES	L-T-P	HOURS	CREDIT
D	EET418	ELECTRIC AND HYBRID VEHICLES	2-1-0	3	3
	EET428	INTERNET OF THINGS	2-1-0		
	EET438	ENERGY STORAGE SYSTEMS	2-1-0		
	EET448	ROBUST AND ADAPTIVE CONTROL	2-1-0		
	EET458	SOLAR PV SYSTEMS	2-1-0		
	EET468	INDUSTRIAL INSTRUMENTATION & AUTOMATION	2-1-0		
	EET478	BIG DATA ANALYTICS	2-1-0		

NOTE

- *All Institutions should keep 4 hours exclusively for Remedial class/Minor/Honours course (Mondays from 10 to 12 and Wednesdays from 10 to 12). If a student does not opt for minor/honours programme, he/she can be given remedial class.
- Comprehensive Course Viva:** The comprehensive course viva in the eighth semester of study shall have a viva voce for 50 marks. The viva voce shall be conducted based on the core subjects studied from third to eighth semester. The viva voce will be conducted by the same three member committee assigned for final project phase II evaluation towards the end of the semester. The pass minimum for this course is 25. The course should be mapped with a faculty and classes shall be arranged for practising questions based on the core courses listed in the curriculum. The mark will be treated as internal and should be uploaded along with internal marks of other courses.
- Project Phase II:** The object of Project Work II & Dissertation is to enable the student to extend further the investigative study taken up in Project 1, either fully theoretical/practical or involving both theoretical and practical work, under the guidance of a Supervisor from the Department alone or jointly with a Supervisor drawn from R&D laboratory/Industry. This is expected to provide a good training for the student(s) in R&D work and technical leadership. The assignment to normally include:
 - In depth study of the topic assigned in the light of the Report prepared under Phase I;
 - Review and finalization of the Approach to the Problem relating to the assigned topic;
 - Detailed Analysis/Modelling/Simulation/Design/Problem Solving/Experiment as needed;

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- Final development of product/process, testing, results, conclusions and future directions;
- Preparing a paper for Conference presentation/Publication in Journals, if possible;
- Preparing a Dissertation in the standard format for being evaluated by the Department;
- Final Presentation before a Committee

Total marks: 150, only CIE, minimum required to pass 75

Guide : 30

Interim evaluation, 2 times in the semester by the evaluation committee : 50

Quality of the report evaluated by the above committee : 30

(The evaluation committee comprises HoD or a senior faculty member, Project coordinator and project supervisor).

Final evaluation by a three-member committee : 40

(The final evaluation committee comprises Project coordinator, expert from Industry/research Institute and a senior faculty from a sister department. The same committee will conduct comprehensive course viva for 50 marks).

MINOR

Minor is an additional credential a student may earn if s/he does 20 credits worth of additional learning in a discipline other than her/his major discipline of B.Tech. degree. The objective is to permit a student to customize their Engineering degree to suit their specific interests. Upon completion of an Engineering Minor, a student will be better equipped to perform interdisciplinary research and will be better employable. Engineering Minors allow a student to gain interdisciplinary experience and exposure to concepts and perspectives that may not be a part of their major degree programs.

The academic units offering minors in their discipline will prescribe the set of courses and/or other activities like projects necessary for earning a minor in that discipline. A specialist basket of 3-6 courses is identified for each Minor. Each basket may rest on one or more foundation courses. A basket may have sequences within it, i.e., advanced courses may rest on basic courses in the basket. S/he accumulates credits by registering for the required courses, and if the requirements for a particular minor are met within the time limit for the course, the minor will be awarded. This will be mentioned in the Degree Certificate as “Bachelor of Technology in xxx with Minor in yyy”. The fact will also be reflected in the consolidated grade card, along with the list of courses taken. If one specified course cannot be earned during the course of the programme, that minor will not be awarded. The individual course credits earned, however, will be reflected in the consolidated grade card.

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(i) The curriculum/syllabus committee/BoS shall prepare syllabus for courses to be included in the curriculum from third to eight semesters for all branches. The minor courses shall be identified by **M slot courses**.

(ii) Registration is permitted for Minor at the beginning of third semester. Total credits required is 182 (162 + 20 credits from value added courses)

(iii) Out of the 20 Credits, 12 credits shall be earned by undergoing a minimum of three courses listed in the curriculum for minor, of which one course shall be a mini project based on the chosen area. They can do miniproject either in S7 or in S8. The remaining 8 credits could be acquired by undergoing 2 MOOCs recommended by the Board of studies and approved by the Academic Council or through courses listed in the curriculum. The classes for Minor shall be conducted along with regular classes and no extra time shall be required for conducting the courses.

(iv) There won't be any supplementary examination for the courses chosen for Minor.

(v) On completion of the program, "Bachelor of Technology in xxx with Minor in yyy" will be awarded.

(vi) The registration for minor program will commence from semester 3 and the all academic units offering minors in their discipline should prescribe set of such courses. The courses shall be grouped into maximum of 3 baskets. The basket of courses may have sequences within it, i.e., advanced courses may rest on basic courses in the basket. Reshuffling of courses between various baskets will not be allowed. In any case, they should carry out a mini project based on the chosen area in S7 or S8. Students who have registered for **B.Tech Minor in ELECTRICAL & ELECTRONICS ENGINEERING** can opt to study the courses listed below:

S e m e s t e r	BASKET I				BASKET II				BASKET III			
	Course No.	Course Name	H O U R S	C R E D I T	Course No.	Course Name	H O U R S	C R E D I T	Course No.	Course Name	H O U R S	C R E D I T
S3	EET281	ELECTRIC CIRCUITS	4	4	EET 283	INTRODUCTION TO POWER ENGINEERING	4	4	EET 285	DYNAMIC CIRCUITS AND SYSTEMS	4	4
S4	EET 282	ELECTRICAL MACHINES	4	4	EET 284	ENERGY SYSTEMS	4	4	EET 286	PRINCIPLES OF INSTRUMENTATION	4	4
S5	EET 381	SOLID STATE POWER CONVERSION	4	4	EET 383	SOLAR AND WIND ENERGY CONVERSION SYSTEMS	4	4	EET 385	CONTROL SYSTEMS	4	4
S6	EET 382	POWER SEMICONDUCTOR DRIVES	4	4	EET 384	INSTRUMENTATION AND AUTOMATION OF POWER PLANTS	4	4	EET 386	DIGITAL CONTROL	4	4
S7	EED 481	MINIPROJECT	4	4	EED 481	MINIPROJECT	4	4	EED 481	MINIPROJECT	4	4

S8	EED 482	MINIPROJECT	4	4	EED 482	MINIPROJECT	4	4	EED 482	MINIPROJECT	4	4
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Notes on Minor from Electrical Engineering Department:

Students have to credit additional 5 courses (20 credits) to receive minor in Electrical and Electronics Engineering. While choosing the minor basket, at least two courses in the selected basket should have contents different from the courses in the curriculum of the parent branch. (This is necessary in the case of related branches like Electronics and Communication, Electronics and Instrumentation, Applied Electronics and Instrumentation, Electronics and Biomedical, Computer Science and Engineering etc.) In case where the student chooses a basket with only two courses different from their parent curriculum, the remaining courses have to be selected from the approved MOOC courses. This restriction may be incorporated in the regulations/curriculum.

HONOURS

Honours is an additional credential a student may earn if she/he opts for the extra 20 credits needed for this in her/his own discipline. Honours is not indicative of class. KTU is providing this option for academically extra brilliant students to acquire Honours. Honours is intended for a student to gain expertise/specialise in an area inside his/her major B.Tech discipline and to enrich knowledge in emerging/advanced areas in the branch of engineering concerned. It is particularly suited for students aiming to pursue higher studies. Upon completion of Honours, a student will be better equipped to perform research in her/his branch of engineering. On successful accumulation of credits at the end of the programme, this will be mentioned in the Degree Certificate as "Bachelor of Technology in xxx, with Honours." The fact will also be reflected in the consolidated grade card, along with the list of courses taken. If one specified course cannot be earned during the course of the programme, Honours will not be awarded. The individual course credits earned, however, will be reflected in the consolidated grade card.

The courses shall be grouped into maximum of 3 groups, each group representing a particular specialization in the branch. The students shall select only the courses from same group in all semesters. It means that the specialization is to be fixed by the student and cannot be changed subsequently. The internal evaluation, examination and grading shall be exactly as for other mandatory courses. The Honours courses shall be identified by H slot courses.

- (i) The curriculum/syllabus committee/BoS shall prepare syllabus for courses to be included in the curriculum from fourth to eight semesters for all branches. The honours courses shall be identified by H slot courses.
- (ii) Registration is permitted for Honours at the beginning of fourth semester. Total credits required is 182 (162 + 20 credits from value added courses).

ELECTRICAL & ELECTRONICS ENGINEERING

- (iii) Out of the 20 Credits, 12 credits shall be earned by undergoing a minimum of three courses listed in the curriculum for honours, of which one course shall be a mini project based on the chosen area. The remaining 8 credits could be acquired through 2 MOOCs recommended by the Board of studies and approved by the Academic Council or through courses listed in the curriculum. The classes for Honours shall be conducted along with regular classes and no extra time shall be required for conducting the courses. The students should earn a grade of 'C' or better for all courses under honours.
- (iv) There won't be any supplementary examination for the courses chosen for honours.
- (v) On successful accumulation of credits at the end of the programme, "Bachelor of Technology in xxx, with Honours" will be awarded if overall CGPA is greater than or equal to 8.5, earned a grade of 'C' or better for all courses chosen for honours and without any history of 'F' Grade.
- (vi) The registration for honours program will commence from semester 4 and the all academic units offering honours in their discipline should prescribe set of such courses. The courses shall be grouped into maximum of 3 groups, each group representing a particular specialization in the branch. The students shall select only the courses from same group in all semesters. It means that the specialization is to be fixed by the student and cannot be changed subsequently. In any case, they should carry out a mini project based on the chosen area in S8. For example: Students who have registered for **B.Tech Honours in ELECTRICAL & ELECTRONICS ENGINEERING** can opt to study the courses listed below:

S e m e s t e r	GROUP I				GROUP II				GROUP III			
	Course No	Course Name	H O U R S	C R E D I T	Course No	Course Name	H O U R S	C R E D I T	Course No	Course Name	H O U R S	C R E D I T
S4	EET292	NETWORK ANALYSIS AND SYNTHESIS	4	4	EET 294	NETWORK ANALYSIS AND SYNTHESIS	4	4	EET 296	NETWORK ANALYSIS AND SYNTHESIS	4	4
S5	EET393	DIGITAL SIMULATION	4	4	EET 395	DIGITAL SIMULATION	4	4	EET 397	DIGITAL SIMULATION	4	4
S6	EET394	GENERALISED MACHINE THEORY	4	4	EET 396	ANALYSIS OF POWER ELECTRONIC CIRCUITS	4	4	EET 398	OPERATION AND CONTROL OF POWER SYSTEMS	4	4
S7	EET495	OPERATION AND CONTROL OF GENERATORS	4	4	EET 497	DYNAMICS OF POWER CONVERTERS	4	4	EET 499	CONTROL AND DYNAMICS OF MICROGRIDS	4	4
S8	EED496	MINIPROJECT	4	4	EED 496	MINIPROJECT	4		EED 496	MINIPROJECT	4	4

INDUCTION PROGRAM

There will be three weeks induction program for first semester students. It is a unique three-week immersion Foundation Programme designed especially for the fresher's which includes a wide range of activities right from workshops, lectures and seminars to sports tournaments, social work and much more. The programme is designed to mould students into well-rounded individuals, aware and sensitized to local and global conditions and foster their creativity, inculcate values and ethics, and help students to discover their passion. Foundation Programme also serves as a platform for the fresher's to interact with their batchmates and seniors and start working as a team with them. The program is structured around the following five themes:

The programme is designed keeping in mind the following objectives:

- **Values and Ethics:** Focus on fostering a strong sense of ethical judgment and moral fortitude.
- **Creativity:** Provide channels to exhibit and develop individual creativity by expressing themselves through art, craft, music, singing, media, dramatics, and other creative activities.
- **Leadership, Communication and Teamwork:** Develop a culture of teamwork and group communication.
- **Social Awareness:** Nurture a deeper understanding of the local and global world and our place in it as concerned citizens of the world.
- **Physical Activities & Sports:** Engage students in sports and physical activity to ensure healthy physical and mental growth.





VISWAJYOTHI COLLEGE OF ENGINEERING & TECHNOLOGY

(Approved by AICTE, Affiliated to APJ Abdul Kalam Technological University, Kerala)

Vazhakulam P.O., Muvattupuzha, Ernakulam Dist., Kerala, India - 686 670

Ph: 0485 2262211, 2262244, 2262255, 2262977, Fax : 0485 2262211

Web : www.vjcet.ac.in E-mail : vjcet@vjcet.org, vjcvklm@gmail.com



All B.Tech Programmes (CE, CSE, ECE, EEE, IT & ME) Accredited by NBA

Date : 28/04/2021

Self Declaration

Subject: Reference to metric number 1.3.2. Experiential learning courses in the curriculum apart from Project work/ Internship/ field work

In Information Technology, for undergraduate programme, semesters from 1 to 6 consists of 8 courses out of which 2 are laboratory courses and semester 7 consists of 1 laboratory course as per APJ Abdul Kalam Technological University in addition to project work/Internships/Field work. In MG university, for undergraduate programme, semesters from 1 to 5 and semester 7 consists of 8 courses out of which 2 are laboratory courses and semester 6 and 8 consists of 1 laboratory course. In laboratory courses, students undergo experiential learning related to one or more theory courses. Thus each student goes through more than 30% of experiential learning in each semester.



Dr. K.K. Rajan
Principal

Viswajyothi College of Engineering & Technology
Vazhakulam P.O., Muvattupuzha, Kerala-686 670

Note: Sample copy of scheme and syllabus is enclosed along with this letter.

Mahatma Gandhi University Revised Scheme For
B Tech Syllabus Revision 2010
Information Technology
Common for All Branches
SCHEME S1&S2

Code	Subject	Hours/week			Marks		End-sem duration- hours	Credits
		L	T	P/D	Internal	End-sem		
EN010 101	Engineering Mathematics I	2	1	-	50	100	3	5
EN010 102	Engineering Physics	1	1	-	50	100	3	4
EN010 103	Engineering. Chemistry & Environmental Studies	1	1	-	50	100	3	4
EN010 104	Engineering Mechanics	3	1	-	50	100	3	6
EN010 105	Engineering Graphics	1	3	-	50	100	3	6
EN010 106	Basic Civil Engineering	1	1	-	50	100	3	4
EN010 107	Basic Mechanical Engineering	1	1	-	50	100	3	4
EN010 108	Basic Electrical Engineering	1	1	-	50	100	3	4
EN010 109	Basic Electronics Engineering. & Information Technology	2	1	-	50	100	3	5
<i>EN010 110</i>	<i>Mechanical Workshop</i>	-	-	3	50	-	3	1
<i>EN110 111</i>	Electrical and Civil Workshops	-	-	3	100	-	3	1
	Total	13	11	6			30	44

3rd Semester

Code	Subject	Hours/week			Marks		End-sem duration-hours	Credits
		L	T	P/D	Internal	End-sem		
EN010 301B	Engineering Mathematics II	2	2	-	50	100	3	4
EN010 302	Economics and Communication Skills	2	2	-	50	100	3	4 (3+1)
IT010 303 (EC)	Discrete and Integrated Electronic Circuits	2	2	-	50	100	3	4
IT010 304	Switching Theory and Logic Design	3	1	-	50	100	3	4
IT010 305(EC)	Principles of Communication Engineering	3	1	-	50	100	3	4
IT010 306	Problem Solving and Computer Programming	3	1	-	50	100	3	4
IT010 307 (EC)	<i>Electronic Circuits and Communication Lab</i>	-	-	3	50	100	3	2
IT010 308	<i>Programming Lab</i>	-	-	3	50	100	3	2
	Total	15	9	6				28

4th Semester

Code	Subject	Hours/week			Marks		End-sem duration-hours	Credits
		L	T	P/D	Internal	End-sem		
EN010 401	Engineering Mathematics III	2	2	-	50	100	3	4
EN010 402(ME)	Principles of Management	3	1	-	50	100	3	4
IT010 403	Computer Organisation and Architecture	2	2	-	50	100	3	4
IT010 404	Theory of Computation	3	1	-	50	100	3	4
IT010 405	Data Structures and Algorithms	3	1	-	50	100	3	4
IT010 406	Object Oriented Techniques	3	1	-	50	100	3	4
IT010 407	<i>Logic Design Lab</i>	-	-	3	50	100	3	2
IT010 408	<i>Data Structures and Programming Lab</i>	-	-	3	50	100	3	2
	Total	16	8	6				28

5th Semester

Code	Subject	Hours/week			Marks		End-sem duration- hours	Credits
		L	T	P/D	Internal	End-sem		
EN010 501B	Engineering Mathematics IV	2	2	-	50	100	3	4
IT010 502	Microprocessors and Microcontrollers	3	1		50	100	3	4
IT010 503	Data Communication	2	2	-	50	100	3	4
IT010 504	Operating Systems	3	1	-	50	100	3	4
IT010 505	Language Translators	3	1	-	50	100	3	4
IT010 506	Database Management Systems	3	1	-	50	100	3	4
IT010 507	PC Hardware and Microprocessors Lab	-	-	3	50	100	3	2
IT010 508	Systems Lab	-	-	3	50	100	3	2
	Total	16	8	6				28

6th Semester

Code	Subject	Hours/week			Marks		End-sem duration- hours	Credits
		L	T	P/D	Internal	End-sem		
IT010 601	Computer Networks	2	2	-	50	100	3	4
IT010 602(EC)	Digital Signal Processing	2	2	-	50	100	3	4
IT010 603(EC)	Information Theory and Coding	3	1	-	50	100	3	4
IT010 604	Software Engineering	3	1	-	50	100	3	4
IT010 605	Design and Analysis of Algorithms	3	1	-	50	100	3	4
IT010 606Lxx	Elective I	2	2	-	50	100	3	4
IT010 607	Network Programming Lab	-	-	3	50	100	3	2
IT010 608	Mini Project	-	-	3	50	100	3	2
	Total	15	9	6				28

Elective I

- IT010 606L01 Simulation and Modelling
- IT010 606L02 Management Information Systems
- IT010 606L03 UNIX Shell Programming
- IT010 606L04 Advanced Database Systems
- IT010 606L05 Parallel Computing
- IT010 606L06 Optimization Techniques

7th Semester

Code	Subject	Hours/week			Marks		End-sem duration -hours	Credits
		L	T	P/D	Internal	End-sem		
IT010 701	Financial Management and E-Banking	2	2	-	50	100	3	4
IT010 702	Object Oriented Modelling and Design	2	2	-	50	100	3	4
IT010 703	Computer Graphics and Multimedia Systems	2	1	-	50	100	3	3
IT010 704	Internetworking	2	1	-	50	100	3	3
IT010 705	Web Applications Development	2	1	-	50	100	3	3
IT010 706Lxx	Elective II	2	2	-	50	100	3	4
IT010 707	Internetworking Lab	-	-	3	50	100	3	2
IT010 708	Computer Aided Software Engineering Lab	-	-	3	50	100	3	2
IT010 709	Seminar	-	-	2	50	-	-	2
IT010 710	Project	-	-	1	50	-	-	1
	Total	12	9	9				28

Elective II

IT010 706L01 Software Project Management

IT010 706L02 Optical Communication Networks

IT010 706 L03 Digital Speech and Image Processing

IT010 706L04 Real Time Systems

IT010 706L05 Operating System Kernel Design

IT010 706L06 Data Mining and Data Warehousing

8th Semester

Code	Subject	Hours/week			Marks		End-sem duration- hours	Credits
		L	T	P/D	Internal	End-sem		
IT010 801	Wireless Communication	3	2	-	50	100	3	4
IT010 802	Cryptography and Network Security	2	2	-	50	100	3	4
IT010 803	Artificial Intelligence	2	2	-	50	100	3	4
IT010 804Lxx	Elective III	2	2	-	50	100	3	4
IT010 805Gxx	Elective IV	2	2	-	50	100	3	4
IT010 806	Web Applications Lab	-	-	3	50	100	3	2
IT010 807	Project	-	-	6	100	-	-	4
IT010 808	Viva Voce	-	-	-	-	50	-	2
	Total	11	10	9				28

Electives III

IT010 804L01 Software Testing
IT010 804L02 Information Retrieval
IT010 804L03 High Speed Networks
IT010 804L04 Network Administration and Management
IT010 804L05 Enterprise Resource Planning
IT010 804L06 Grid Computing

Electives IV

IT010 805G01 Software Architecture
IT010 805G02 Advanced Mathematics
IT010 805G03 Ad Hoc and Sensor Networks
IT010 805G04 Electronic Business and Services
IT010 805G05 Neural Networks
IT010 805G06 Soft Computing



KERALA TECHNOLOGICAL UNIVERSITY

Curriculum for Semesters I and II

2015

Kerala Technological University
CET Campus, Thiruvananthapuram
Kerala -695016 India
Phone +91 471 2598122, 2598422
Fax +91 471 2598522
Web: ktu.edu.in
Email: university@ktu.edu.in

SEMESTER I

Slot	Course No.	Subject	L-T-P	Hours	Credits
A	MA101	Calculus	3-1-0	4	4
B (1/2)	PH100	Engineering Physics	3-1-0	4	4
	CY100	Engineering Chemistry	3-1-0	4	4
C (1/2)	BE100	Engineering Mechanics	3-1-0	4	4
	BE110	Engineering Graphics	1-1-2	4	3
D	BE101-0X	Introduction to _____ Engineering	2-1-0	3	3
E	BE103	Introduction to Sustainable Engineering	2-0-1	3	3
F (1/4)	CE100	Basics of Civil Engineering	2-1-0	3	3
	ME100	Basics of Mechanical Engineering	2-1-0	3	3
	EE100	Basics of Electrical Engineering	2-1-0	3	3
	EC100	Basics of Electronics Engineering	2-1-0	3	3
S (1/2)	PH110	Engineering Physics Lab	0-0-2	2	1
	CY110	Engineering Chemistry Lab	0-0-2	2	1
T (2/4)	CE110/ME110/ EE110/EC110/ CS110/CH110	Basic Engineering Workshops (CS110 for CS and related branches and CH110 for CH and related branches only)	0-0-2 + 0-0-2	2 2	1 1
U		U100 Language lab/ Bridge courses/ Remedial programmes/Micro Projects etc	0-0-3	3	
				30	24/23
V		V100 Entrepreneurship/TBI/NCC/NSS/ Physical Edn. etc	0-0-2	2	Activity points

SEMESTER II

Slot	Course No.	Subject	L-T-P	Hours	Credits
A	MA102	Differential Equations	3-1-0	4	4
B (1/2)	PH100	Engineering Physics	3-1-0	4	4
	CY100	Engineering Chemistry	3-1-0	4	4
C (1/2)	BE100	Engineering Mechanics	3-1-0	4	4
	BE110	Engineering Graphics	1-1-2	4	3
D	BE102	Design & Engineering	2-0-2	4	3
E, F (2/4)	CE 100	Basics of Civil Engineering	2-1-0	3	3
	ME 100	Basics of Mechanical Engineering	2-1-0	3	3
	EE 100	Basics of Electrical Engineering	2-1-0	3	3
	EC 100	Basics of Electronics Engineering	2-1-0	3	3
S (1/2)	PH110	Engineering Physics Lab	0-0-2	2	1
	CY110	Engineering Chemistry Lab	0-0-2	2	1
T (2/4)	CE110/ME110/ EE110/EC110	Basic Engineering Workshops	0-0-2	2	1
			+ 0-0-2	2	1
U		U100 Language lab / Bridge courses/ Remedial programmes/Micro Projects etc	0-0-2	2	
				30	24/23
V		V100 Entrepreneurship /TBI/NCC/NSS/ Physical Edn. etc	0-0-2	2	Activity points

Note: 1. Institutions can assign **two of four** Basics of Engineering courses not already taken by the student in the previous semester and the corresponding Workshop courses in Semester 2.



APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

**Curriculum
for
B.Tech Degree
Semesters III to VIII
2016**

Information Technology

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

CET CAMPUS, THIRUVANANTHAPURAM – 695016

KERALA, INDIA

Phone +91 471 2598122, 2598422

Fax +91 471 2598522 Web: ktu.edu.in

Email: university@ktu.edu.in

BRANCH: *Information Technology*

SEMESTER - 3

Course Code	Course Name	L-T-P	Credits	Exam Slot
MA201	Linear Algebra & Complex Analysis	3-1-0	4	A
CS201	Discrete Computational Structures	3-1-0	4	B
IT201	Digital System Design	3-1-0	4	C
CS205	Data Structures	3-1-0	4	D
IT203	Data Communication	3-0-0	3	E
HS200/ HS210	Business Economics/Life Skills	3-0-0/ 2-0-2	3	F
CS231	Data Structures Lab	0-0-3	1	S
IT231	Digital Circuits Lab	0-0-3	1	T

Total Credits = 24

Hours: 28/29

Cumulative Credits= 71

SEMESTER - 4

Course Code	Course Name	L-T-P	Credits	Exam Slot
MA202	Probability Distributions, Transforms and Numerical Methods	3-1-0	4	A
CS202	Computer Organization and Architecture	3-1-0	4	B
IT202	Algorithm Analysis & Design	4-0-0	4	C
IT204	Object Oriented Techniques	3-0-0	3	D
CS208	Principles of Data Base Design	3-0-0	3	E
HS210/ HS200	Life Skills/Business Economics	2-0-2/ 3-0-0	3	F
IT232	Object Oriented Programming Lab	0-0-3	1	S
IT234	Algorithm Design Lab	0-0-3	1	T

Total Credits = 23

Hours 28/27

Cumulative Credits= 94

BRANCH: *Information Technology*

SEMESTER - 5

Course Code	Course Name	L-T-P	Credits	Exam Slot
IT301	Software Architecture & Design Patterns	3-1-0	4	A
IT303	Theory of Computation	3-0-0	3	B
CS305	Microprocessors & Microcontrollers	2-1-0	3	C
IT305	Operating Systems	3-0-0	3	D
IT307	Computer Networks	3-0-0	3	E
	Elective 1	3-0-0	3	F
IT341	Design Project	0-1-2	2	S
IT331	Microcontroller Lab	0-0-3	1	T
IT333	Database Lab	0-0-3	1	U

Total Credits = 23

Hours: 28

Cumulative Credits= 117

- Elective 1:-**
1. IT361 Graph Theory
 2. IT363 UNIX Shell Programming
 3. IT365 Computer Architecture & Parallel Processing
 4. IT367 Computer Graphics & Multimedia
 5. MA361 Random Process and Queuing Theory

BRANCH: *Information Technology*

SEMESTER - 6

Course Code	Course Name	L-T-P	Credits	Exam Slot
IT302	Internet Technology	4-0-0	4	A
CS304	Compiler Design	2-1-0	3	B
IT304	Data Warehousing & Mining	3-0-0	3	C
IT306	Distributed Systems	3-0-0	3	D
HS300	Principles of Management	3-0-0	3	E
	Elective 2	3-0-0	3	F
IT332	Internet Technology Lab	0-0-3	1	S
IT334	Computer Networks Lab	0-0-3	1	T
IT352	Comprehensive Exam	0-1-1	2	U

Total Credits = 23

Hours: 27

Cumulative Credits= 140

Elective 2:-

1. IT362 Information Retrieval
2. IT364 Software Project Management
3. IT366 Advanced DBMS
4. IT368 Information Theory & Coding
5. MA362 Abstract Algebra and Number Theory

BRANCH: *Information Technology*

SEMESTER - 7

Course Code	Course Name	L-T-P	Credits	Exam Slot
IT401	Embedded Systems	4-0-0	4	A
IT403	Mobile Computing	3-0-0	3	B
IT405	Internet Working with TCP/IP	3-0-0	3	C
IT407	Knowledge Engineering	3-0-0	3	D
IT409	Web Application Development	3-0-0	3	E
	Elective 3	3-0-0	3	F
IT451	Seminar & Project Preliminary	0-1-4	2	S
IT431	Web Application Development Lab	0-0-3	1	T

Total Credits = 22

Hours: 27

Cumulative Credits= 162

Elective 3:-

1. IT461 Software Testing & Quality Assurance
2. IT463 Semantic Web
3. IT465 Cyber Forensics
4. CS467 Machine Learning

BRANCH: *Information Technology*

SEMESTER - 8

Course Code	Course Name	L-T-P	Credits	Exam Slot
IT402	Cryptography & Cyber Security	3-0-0	3	A
IT404	Data Analytics	3-0-0	3	B
	Elective 4	3-0-0	3	C
	Elective 5 (Non Departmental)	3-0-0	3	D
IT492	Project		6	S

Total Credits = 18

Hours: 30

Cumulative Credits= 180

Elective 4:-

1. IT462 Internet of Things
2. CS468 Cloud Computing
3. IT464 Information Storage Management
4. IT466 Adhoc & Sensor Networks
5. IT468 Service Oriented Architecture

ELECTIVE 5 (NON DEPARTMENTAL ELECTIVE COURSES)

(Note:- If a student has studied or chosen the elective course given in the bracket then the corresponding ND elective cannot be chosen)

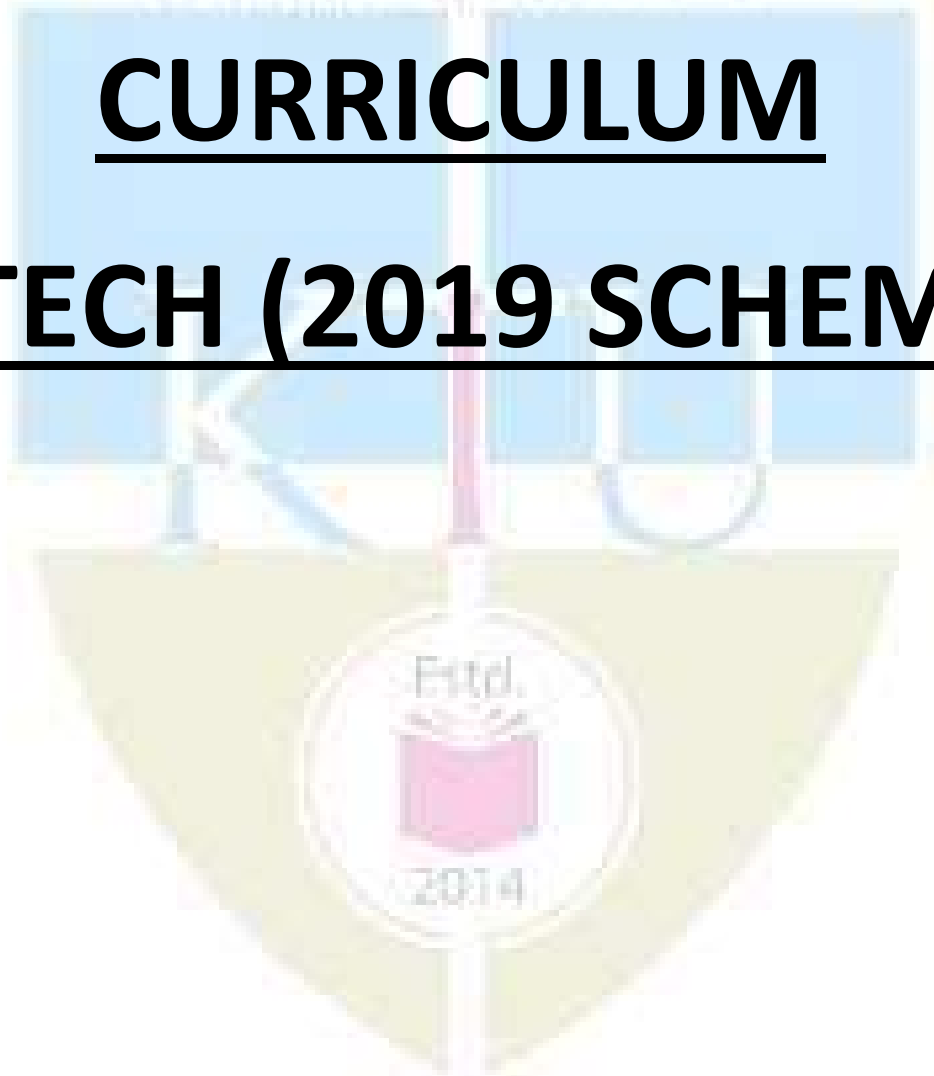
1. AO482 FLIGHT AGAINST GRAVITY
2. AE482 INDUSTRIAL INSTRUMENTATION
3. AE484 INSTRUMENTATION SYSTEM DESIGN
4. AU486 NOISE, VIBRATION AND HARSHNESS
5. BM482 BIOMEDICAL INSTRUMENTATION
6. BM484 MEDICAL IMAGING & IMAGE PROCESSING TECHNIQUES
7. BT461 DESIGN OF BIOLOGICAL WASTE WATER SYSTEMS
8. BT362 SUSTAINABLE ENERGY PROCESSES
9. CH482 PROCESS UTILITIES AND PIPE LINE DESIGN
10. CH484 FUEL CELL TECHNOLOGY
11. CE482 ENVIRONMENTAL IMPACT ASSESSMENT
12. CE484 APPLIED EARTH SYSTEMS
13. CE486 GEO INFORMATICS FOR INFRASTRUCTURE MANAGEMENT
14. CE488 DISASTER MANAGEMENT
15. CE494 ENVIRONMENT HEALTH AND SAFETY
16. CS484 COMPUTER GRAPHICS (IT 367/COMPUTER GRAPHICS AND MULTIMEDIA)
17. CS488 C # AND .NET PROGRAMMING
18. EE482 ENERGY MANAGEMENT AND AUDITING
19. EE484 CONTROL SYSTEMS
20. EE486 SOFT COMPUTING
21. EE488 INDUSTRIAL AUTOMATION
22. EE494 INSTRUMENTATION SYSTEMS
23. EC482 BIOMEDICAL ENGINEERING

24. FT482	FOOD PROCESS ENGINEERING
25. FT484	FOOD STORAGE ENGINEERING
26. FT486	FOOD ADDITIVES AND FLAVOURING
27. IE482	FINANCIAL MANAGEMENT
28. IE484	INTRODUCTION TO BUSINESS ANALYTICS
29. IE486	DESIGN AND ANALYSIS OF EXPERIMENTS
30. IE488	TOTAL QUALITY MANAGEMENT
31. IC482	BIOMEDICAL SIGNAL PROCESSING
32. MA482	APPLIED LINEAR ALGEBRA
33. MA484	OPERATIONS RESEARCH
34. MA486	ADVANCED NUMERICAL COMPUTATIONS
35. ME484	FINITE ELEMENT ANALYSIS
36. ME482	ENERGY CONSERVATION AND MANAGEMENT
37. ME471	OPTIMIZATION TECHNIQUES
38. MP482	PRODUCT DEVELOPMENT AND DESIGN
39. MP469	INDUSTRIAL PSYCHOLOGY & ORGANIZATIONAL BEHAVIOUR
40. MP484	PROJECT MANAGEMENT (IT 364/ SOFTWARE PROJECT MANAGEMENT)
41. MT482	INDUSTRIAL SAFETY
42. MR482	MECHATRONICS
43. FS482	RESPONSIBLE ENGINEERING
44. SB482	DREDGERS AND HARBOUR CRAFTS
45. HS482	PROFESSIONAL ETHICS

AMU ABDUL KALAM
TECHNOLOGICAL
UNIVERSITY

CURRICULUM

B.TECH (2019 SCHEME)



CURRICULUM I TO VIII: B.Tech INFORMATION TECHNOLOGY

Every course of B. Tech. Program shall be placed in one of the nine categories as listed in table below.

Sl. No	Category	Code	Credits
1	Humanities and Social Sciences including Management courses	HMC	8
2	Basic Science courses	BSC	26
3	Engineering Science Courses	ESC	22
4	Program Core Courses	PCC	76
5	Program Elective Courses	PEC	15
6	Open Elective Courses	OEC	3
7	Project work and Seminar	PWS	10
8	Mandatory Non-credit Courses (P/F) with grade	MNC	-----
9	Mandatory Student Activities (P/F)	MSA	2
	Total Mandatory Credits		162
10	Value Added Course (Optional)	VAC	20

No semester shall have more than six lecture-based courses and two laboratory and/or drawing/seminar/project courses in the curriculum. Semester-wise credit distribution shall be as below:

Sem	1	2	3	4	5	6	7	8	Total
Credits	17	21	22	22	23	23	15	17	160
Activity Points	50				50				---
Credits for Activity	2								2
G.Total									162

Basic Science Courses: Maths, Physics, Chemistry, Biology for Engineers, Life Science etc

Engineering science courses: Basic Electrical, Engineering Graphics, Programming, Workshop, Basic Electronics, Basic Civil, Engineering Mechanics, Mechanical Engineering, Thermodynamics, Design Engineering, Materials Engineering etc.

Humanities and Social Sciences including Management courses: English, Humanities, Professional Ethics, Management, Finance & Accounting, Life Skills, Professional Communication, Economics etc

Mandatory non-credit courses: Sustainable Engineering, Constitution of India/Essence of Indian Knowledge Tradition, Industrial Safety Engineering, disaster management etc.

Course Code and Course Number

Each course is denoted by a unique code consisting of three alphabets followed by three numerals like **E C L 2 0 1**. The first two letter code refers to the department offering the course. EC stands for course in Electronics & Communication, course code MA refers to a course in Mathematics, course code ES refers to a course in Engineering Science etc. Third letter stands for the nature of the course as indicated in the Table 1.

Table 1: Code for the courses

Code	Description
T	Theory based courses (other than the lecture hours, these courses can have tutorial and practical hours, e.g., L-T-P structures 3-0-0, 3-1-2, 3-0-2 etc.)
L	Laboratory based courses (where performance is evaluated primarily on the basis of practical or laboratory work with LTP structures like 0-0-3, 1-0-3, 0-1-3 etc.)
N	Non-credit courses
D	Project based courses (Major, Mini Projects)
Q	Seminar Courses

Course Number is a three digit number and the first digit refers to the Academic year in which the course is normally offered, i.e. 1, 2, 3, or 4 for the B. Tech. Programme of four year duration. Of the other two digits, the last digit identifies whether the course is offered normally in the odd (odd number), even (even number) or in both the semesters (zero). The middle number could be any digit. ECL 201 is a laboratory course offered in EC department for third semester, MAT 101 is a course in Mathematics offered in the first semester, EET 344 is a course in Electrical Engineering offered in the sixth semester, PHT 110 is a course in Physics offered both the first and second semesters, EST 102 is a course in Basic Engineering offered by one or many departments. These course numbers are to be given in the curriculum and syllabi.

Departments

Each course is offered by a Department and their two-letter course prefix is given in Table 2.

Table 2: Departments and their codes

Sl.No	Department	Course Prefix	Sl.No	Department	Course Prefix
01	Aeronautical Engg	AO	16	Information Technology	IT
02	Applied Electronics & Instrumentation	AE	17	Instrumentation & Control	IC
03	Automobile	AU	18	Mandatory Courses	MC
04	Biomedical Engg	BM	19	Mathematics	MA
05	Biotechnology	BT	20	Mechanical Engg	ME
06	Chemical Engg	CH	21	Mechatronics	MR
07	Chemistry	CY	22	Metallurgy	MT
08	Civil Engg	CE	23	Mechanical (Auto)	MU
09	Computer Science	CS	24	Mechanical(Prod)	MP
10	Electrical & Electronics	EE	25	Naval & Ship Building	SB
11	Electronics & Biomedical	EB	26	Physics	PH
12	Electronics & Communication	EC	27	Polymer Engg	PO
13	Food Technology	FT	28	Production Engg	PE
14	Humanities	HU	29	Robotics and Automation	RA
15	Industrial Engg	IE	30	Safety & Fire Engg	FS

SEMESTER I

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	MAT 101	LINEAR ALGEBRA AND CALCULUS	3-1-0	4	4
B 1/2	PHT 100	ENGINEERING PHYSICS A	3-1-0	4	4
	CYT 100	ENGINEERING CHEMISTRY	3-1-0	4	4
C 1/2	EST 100	ENGINEERING MECHANICS	2-1-0	3	3
	EST 110	ENGINEERING GRAPHICS	2-0-2	4	3
D 1/2	EST 120	BASICS OF CIVIL & MECHANICAL ENGINEERING	4-0-0	4	4
	EST 130	BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING	4-0-0	4	4
E	HUT 101	LIFE SKILLS	2-0-2	4	--
S 1/2	PHL 120	ENGINEERING PHYSICS LAB	0-0-2	2	1
	CYL 120	ENGINEERING CHEMISTRY LAB	0-0-2	2	1
T 1/2	ESL 120	CIVIL & MECHANICAL WORKSHOP	0-0-2	2	1
	ESL 130	ELECTRICAL & ELECTRONICS WORKSHOP	0-0-2	2	1
TOTAL				23/24 *	17

*Minimum hours per week

NOTE:

To make up for the hours lost due to induction program, one extra hour may be allotted to each course

SEMESTER II

SLOT	COURSE NO	COURSES	L-T-P	HOURS	CREDIT
A	MAT 102	VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TRANSFORMS	3-1-0	4	4
B 1/2	PHT 100	ENGINEERING PHYSICS A	3-1-0	4	4
	CYT 100	ENGINEERING CHEMISTRY	3-1-0	4	4
C 1/2	EST 100	ENGINEERING MECHANICS	2-1-0	3	3
	EST 110	ENGINEERING GRAPHICS	2-0-2	4	3
D 1/2	EST 120	BASICS OF CIVIL & MECHANICAL ENGINEERING	4-0-0	4	4
	EST 130	BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING	4-0-0	4	4
E	HUT 102	PROFESSIONAL COMMUNICATION	2-0-2	4	--
F	EST 102	PROGRAMMING IN C	2-1-2	5	4
S 1/2	PHL 120	ENGINEERING PHYSICS LAB	0-0-2	2	1
	CYL 120	ENGINEERING CHEMISTRY LAB	0-0-2	2	1
T 1/2	ESL 120	CIVIL & MECHANICAL WORKSHOP	0-0-2	2	1
	ESL 130	ELECTRICAL & ELECTRONICS WORKSHOP	0-0-2	2	1
TOTAL				28/29	21

NOTE:

1. Engineering Physics A and Engineering Chemistry shall be offered in both semesters. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Engineering Physics A in S1 and Engineering Chemistry in S2 & vice versa. Students opting for Engineering Physics A in a semester should attend Physics Lab in the same semester and students opting for Engineering Chemistry in one semester should attend Engineering Chemistry Lab in the same semester.
2. Engineering Mechanics and Engineering Graphics shall be offered in both semesters. Institutions can advise students belonging to about 50% of the number of branches

in the Institution to opt for Engineering Mechanics in S1 and Engineering Graphics in S2 & vice versa.

3. Basics of Civil & Mechanical Engineering and Basics of Electrical & Electronics Engineering shall be offered in both semesters. Basics of Civil & Mechanical Engineering contain equal weightage for Civil Engineering and Mechanical Engineering. Slot for the course is D with CIE marks of 25 each and ESE marks of 50 each. Students belonging to branches of AEI, EI, BME, ECE, EEE, ICE, CSE, IT, RA can choose this course in S1.

Basics of Electrical & Electronics Engineering contain equal weightage for Electrical Engineering and Electronics Engineering. Slot for the course is D with CIE marks of 25 each and ESE marks of 50 each. Students belonging to AERO, AUTO, CE, FSE, IE, ME, MECHATRONICS, PE, METTULURGY, BT, BCE, CHEM, FT, and POLY can choose this course in S1. Students having Basics of Civil & Mechanical Engineering in one semester should attend Civil & Mechanical Workshop in the same semester and students having Basics of Electrical & Electronics Engineering in a semester should attend Electrical & Electronics Workshop in the same semester.

4. LIFE SKILLS

Life skills are those competencies that provide the means for an individual to be resourceful and positive while taking on life's vicissitudes. Development of one's personality by being aware of the self, connecting with others, reflecting on the abstract and the concrete, leading and generating change, and staying rooted in time-tested values and principles is being aimed at. This course is designed to enhance the employability and maximize the potential of the students by introducing them to the principles that underlie personal and professional success, and help them acquire the skills needed to apply these principles in their lives and careers.

5. PROFESSIONAL COMMUNICATION

Objective is to develop in the under-graduate students of engineering a level of competence in English required for independent and effective communication for their professional needs. Coverage: Listening, Barriers to listening, Steps to overcome them, Purposive listening practice, Use of technology in the professional world. Speaking, Fluency & accuracy in speech, Positive thinking, Improving self-expression, Tonal variations, Group discussion practice, Reading, Speed reading practice, Use of extensive readers, Analytical and critical reading practice, Writing Professional Correspondence, Formal and informal letters, Tone in formal writing, Introduction to reports. Study Skills, Use of dictionary, thesaurus etc., Importance of contents page, cover & back pages, Bibliography, Language Lab.

SEMESTER III

SLOT	COURSE NO	COURSES	L-T-P	HOURS	CREDIT
A	MAT203	DISCRETE MATHEMATICAL STRUCTURES	3-1-0	4	4
B	ITT201	DATA STRUCTURES	3-1-0	4	4
C	ITT203	DIGITAL SYSTEM DESIGN	3-1-0	4	4
D	ITT205	PROBLEM SOLVING USING PYTHON	3-1-0	4	4
E 1\2	EST200	DESIGN & ENGINEERING	2-0-0	2	2
	HUT200	PROFESSIONAL ETHICS	2-0-0	2	2
F	MCN201	SUSTAINABLE ENGINEERING	2-0-0	2	-----
S	ITL201	DATA STRUCTURES LAB	0-0-3	3	2
T	ITL203	PROGRAMMING AND SYSTEM UTILITIES LAB	0-0-3	3	2
R\M	VAC	REMEDIAL/MINOR COURSE	3-1-0	4*	4
TOTAL				30	22/26

NOTE:

1. Design & Engineering and Professional Ethics shall be offered in both S3 and S4. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Design & Engineering in S3 and Professional Ethics in S4 & vice versa.
2. *All Institutions shall keep 4 hours exclusively for Remedial class/Minor course (Thursdays from 3 to 5 PM and Fridays from 2 to 4 PM). If a student does not opt for minor programme, he/she can be given remedial class.

SEMESTER IV

SLOT	COURSE NO	COURSES	L-T-P	HOURS	CREDIT
A	MAT208	PROBABILITY, STATISTICS AND ADVANCED GRAPH THEORY	3-1-0	4	4
B	ITT202	PRINCIPLES OF OBJECT ORIENTED TECHNIQUES	3-1-0	4	4
C	ITT204	COMPUTER ORGANIZATION	3-1-0	4	4
D	ITT206	DATABASE MANAGEMENT SYSTEMS	3-1-0	4	4
E 1\2	EST200	DESIGN & ENGINEERING	2-0-0	2	2
	HUT200	PROFESSIONAL ETHICS	2-0-0	2	2
F	MCN202	CONSTITUTION OF INDIA	2-0-0	2	-----
S	ITL202	OBJECT ORIENTED TECHNIQUES LAB	0-0-3	3	2
T	ITL204	DATABASE MANAGEMENT SYSTEMS LAB	0-0-3	3	2
R/M/H	VAC	REMEDIAL/MINOR/HONOURS COURSE	3-1-0	4*	4
TOTAL				30	22/26

NOTE:

1. Design & Engineering and Professional Ethics shall be offered in both S3 and S4. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Design & Engineering in S3 and Professional Ethics in S4 & vice versa.
2. *All Institutions should keep 4 hours exclusively for Remedial class/Minor course (Thursdays from 3 to 5 PM and Fridays from 2 to 4 PM). If a student does not opt for minor programme, he/she can be given remedial class.

SEMESTER V

SLOT	COURSE NO	COURSES	L-T-P	HOURS	CREDIT
A	ITT301	WEB APPLICATION DEVELOPMENT	3-1-0	4	4
B	ITT303	OPERATING SYSTEM CONCEPTS	3-1-0	4	4
C	ITT305	DATA COMMUNICATION AND NETWORKING	3-1-0	4	4
D	ITT307	FORMAL LANGUAGES AND AUTOMATA THEORY	3-1-0	4	4
E	ITT309	MANAGEMENT FOR SOFTWARE ENGINEERS	3-0-0	3	3
F	MCN301	DISASTER MANAGEMENT	2-0-0	2	----
S	ITL331	OPERATING SYSTEM AND NETWORK PROGRAMMING LAB	0-0-3	3	2
T	ITL333	WEB APPLICATION DEVELOPMENT LAB	0-0-3	3	2
R\M/H	VAC	REMEDIAL/MINOR/HONOURS COURSE	3-1-0	4*	4
TOTAL				31	23/27

NOTE:

1. *All Institutions should keep 4 hours exclusively for Remedial class/Minor/Honours course (Tuesdays from 3 to 5 PM and Wednesdays from 3 to 5 PM). If a student does not opt for minor/honours programme, he/she can be given remedial class.

SEMESTER VI

SLOT	COURSE NO	COURSES	L-T-P	HOURS	CREDIT
A	ITT302	INTERNETWORKING WITH TCP/IP	3-1-0	4	4
B	ITT304	ALGORITHM ANALYSIS AND DESIGN	3-1-0	4	4
C	ITT306	DATA SCIENCE	3-1-0	4	4
D	ITTXXX	PROGRAMME ELECTIVE I	2-1-0	3	3
E	HUT300	INDUSTRIAL ECONOMICS & FOREIGN TRADE	3-0-0	3	3
F	ITT308	COMPREHENSIVE COURSE WORK	1-0-0	1	1
S	ITL332	COMPUTER NETWORKS LAB	0-0-3	3	2
T	ITD334	MINIPROJECT	0-0-3	3	2
R\M/H	VAC	REMEDIAL/MINOR/HONOURS COURSE	3-1-0	4*	4
TOTAL				29	23/27

PROGRAM ELECTIVE I

SLOT	COURSE NO	COURSES	L-T-P	HOURS	CREDIT
D	ITT312	USER INTERFACE AND USER EXPERIENCE DESIGN	2-1-0	3	3
	ITT322	COMPILER DESIGN	2-1-0		
	ITT332	SOFT COMPUTING	2-1-0		
	ITT342	MICROPROCESSORS	2-1-0		
	ITT352	DISTRIBUTED SYSTEMS	2-1-0		
	ITT362	DIGITAL IMAGE PROCESSING	2-1-0		
	ITT372	SEMANTIC WEB	2-1-0		

NOTE:

- *All Institutions should keep 4 hours exclusively for Remedial class/Minor/Honours course (Tuesdays from 3 to 5 PM and Wednesdays from 2 to 4 PM). If a student does not opt for minor/honours programme, he/she can be given remedial class.
- Comprehensive Course Work: The comprehensive course work in the sixth semester of study shall have a written test of 50 marks. The written examination will be of objective type similar to the GATE examination and will be conducted by the University. **Syllabus for comprehensive examination shall be prepared by the respective BoS choosing any 5 core courses studied from semester 3 to 5.** The pass minimum for this course is 25. The course should be mapped with a faculty and

classes shall be arranged for practising questions based on the core courses listed in the curriculum.

3. Mini project: It is introduced in sixth semester with a specific objective to strengthen the understanding of student's fundamentals through effective application of theoretical concepts. Mini project can help to boost their skills and widen the horizon of their thinking. The ultimate aim of an engineering student is to resolve a problem by applying theoretical knowledge. Doing more projects increases problem-solving skills. Students should identify a topic of interest in consultation with Faculty/Advisor. Review the literature and gather information pertaining to the chosen topic. State the objectives and develop a methodology to achieve the objectives. Carryout the design/fabrication or develop codes/programs to achieve the objectives. Demonstrate the novelty of the project through the results and outputs. The progress of the mini project is evaluated based on a minimum of two reviews. The review committee may be constituted by the Head of the Department. A project report is required at the end of the semester. The product has to be demonstrated for its full design specifications. Innovative design concepts, reliability considerations, aesthetics/ergonomic aspects taken care of in the project shall be given due weight. The internal evaluation will be made based on the product, the report and a viva- voce examination, conducted internally by a 3 member committee appointed by Head of the Department comprising HoD or a senior faculty member, Academic coordinator for that program, project guide/coordinator.

Total marks: 150, CIE 75 marks and ESE 75 marks

Split up for CIE

Attendance : 10

Guide : 15

Project Report : 10

Evaluation by the Committee (will be evaluating the level of completion and demonstration of functionality/specifications, presentation, oral examination, work knowledge and involvement) : 40

SEMESTER VII

SLOT	COURSE NO	COURSES	L-T-P	HOURS	CREDIT
A	ITT401	DATA ANALYTICS	2-1-0	3	3
B	ITTXXX	PROGRAM ELECTIVE II	2-1-0	3	3
C	ITTXXX	OPEN ELECTIVE	2-1-0	3	3
D	MCN401	INDUSTRIAL SAFETY ENGINEERING	2-1-0	3	----
S	ITL411	DATA ANALYTICS LAB	0-0-3	3	2
T	ITQ413	SEMINAR	0-0-3	3	2
U	ITD415	PROJECT PHASE I	0-0-6	6	2
R\M/H	VAC	REMEDIAL/MINOR/HONOURS COURSE	3-1-0	4*	4
TOTAL				28	15/19

PROGRAM ELECTIVE II

SLOT	COURSE NO	COURSES	L-T-P	HOURS	CREDIT
B	ITT413	MOBILE COMPUTING	2-1-0	3	3
	ITT423	ARTIFICIAL INTELLIGENCE	2-1-0		
	ITT433	OBJECT ORIENTED MODELING AND DESIGN	2-1-0		
	ITT443	ADVANCED DATABASE MANAGEMENT SYSTEMS	2-1-0		
	ITT453	MACHINE LEARNING	2-1-0		
	ITT463	OPTIMIZATION AND METAHEURISTICS	2-1-0		
	ITT473	PROBABILISTIC AND STOCHASTIC MODELLING	2-1-0		

OPEN ELECTIVE (OE)

The open elective is offered in semester 7. Each program should specify the courses (maximum 5) they would like to offer as electives for other programs. For example The courses listed below are offered by **the Department of INFORMATION TECHNOLOGY for students of other undergraduate branches offered in the college under KTU .**

SLOT	COURSE NO	COURSES	L-T-P	HOURS	CREDIT
C	ITT415	WEB DESIGNING	2-1-0	3	3
	ITT 425	MULTIMEDIA TECHNIQUES	2-1-0		
	ITT 435	FREE AND OPEN SOURCE SOFTWARE	2-1-0		
	ITT 445	MOBILE APPLICATION DEVELOPMENT	2-1-0		

1. *All Institutions should keep 4 hours exclusively for Remedial class/Minor/Honours course (Mondays from 10 to 12 and Wednesdays from 10 to 12 Noon). If a student does not opt for minor/honours programme, he/she can be given remedial class.
2. Seminar: To encourage and motivate the students to read and collect recent and reliable information from their area of interest confined to the relevant discipline from technical publications including peer reviewed journals, conference, books, project reports etc., prepare a report based on a central theme and present it before a peer audience. Each student shall present the seminar for about 20 minutes duration on the selected topic. The report and the presentation shall be evaluated by a team of faculty members comprising Academic coordinator for that program, seminar coordinator and seminar guide based on style of presentation, technical content, adequacy of references, depth of knowledge and overall quality of the report.

Total marks: 100, only CIE, minimum required to pass 50

Attendance : 10

Guide : 20

Technical Content of the Report: 30

Presentation : 40

3. Project Phase I: A Project topic must be selected either from research literature or the students themselves may propose suitable topics in consultation with their guides. The object of Project Work I is to enable the student to take up investigative study in the broad field of Information Technology, either fully theoretical/practical or involving both theoretical and practical work to be assigned by the Department on a group of three/four students, under the guidance of a Supervisor. This is expected to provide a good initiation for the student(s) in R&D work. The assignment to normally include:

- Survey and study of published literature on the assigned topic;
- Preparing an Action Plan for conducting the investigation, including team work;
- Working out a preliminary Approach to the Problem relating to the assigned topic;
- Block level design documentation
- Conducting preliminary Analysis/ Modelling/ Simulation/ Experiment/ Design/ Feasibility;
- Preparing a Written Report on the Study conducted for presentation to the Department;
- Final Seminar, as oral Presentation before the evaluation committee.

Total marks: 100, only CIE, minimum required to pass 50

Guide : 30

Interim evaluation by the evaluation committee : 20

Final Seminar : 30

The report evaluated by the evaluation committee : 20

The evaluation committee comprises HoD or a senior faculty member, Project coordinator and project supervisor.

SEMESTER VIII

SLOT	COURSE NO	COURSES	L-T-P	HOURS	CREDIT
A	ITT402	CRYPTOGRAPHY AND NETWORK SECURITY	2-1-0	3	3
B	ITTXXX	PROGRAM ELECTIVE III	2-1-0	3	3
C	ITTXXX	PROGRAM ELECTIVE IV	2-1-0	3	3
D	ITTXXX	PROGRAM ELECTIVE V	2-1-0	3	3
E	ITT404	COMPREHENSIVE VIVA VOCE	1-0-0	1	1
U	ITD416	PROJECT PHASE II	0-0-12	12	4
R\M/H	VAC	REMEDIAL/MINOR/HONOURS COURSE	3-1-0	4*	4
TOTAL				29	17/21

PROGRAM ELECTIVE III

SLOT	COURSE NO	COURSES	L-T-P	HOURS	CREDIT
B	ITT414	COMPUTER VISION	2-1-0	3	3
	ITT424	CYBER AND NETWORK FORENSICS	2-1-0		
	ITT434	CLOUD COMPUTING	2-1-0		
	ITT444	DATA MINING AND WAREHOUSING	2-1-0		
	ITT454	SEARCH ENGINE OPTIMISATION	2-1-0		
	ITT464	COMPUTER GRAPHICS	2-1-0		
	ITT474	BLOCK CHAIN TECHNOLOGY	2-1-0		

PROGRAM ELECTIVE IV

SLOT	COURSE NO	COURSES	L-T-P	HOURS	CREDIT
C	ITT416	SOCIAL NETWORKS ANALYSIS	2-1-0	3	3
	ITT426	INTERNET OF THINGS	2-1-0		
	ITT436	HIGH SPEED NETWORKS	2-1-0		
	ITT446	ADHOC AND WIRELESS SENSOR NETWORKS	2-1-0		
	ITT456	HUMAN COMPUTER INTERFACING	2-1-0		
	ITT466	PIPELINING AND PARALLEL PROCESSING	2-1-0		
	ITT476	NETWORK SCIENCE	2-1-0		

PROGRAM ELECTIVE V

SLOT	COURSE NO	COURSES	L-T-P	HOURS	CREDIT
D	ITT418	INFORMATION STORAGE MANAGEMENT	2-1-0	3	3
	ITT428	SOFTWARE QUALITY ASSURANCE	2-1-0		
	ITT438	SOFTWARE ARCHITECTURE	2-1-0		
	ITT448	NETWORK ON CHIPS	2-1-0		
	ITT458	NATURAL LANGUAGE PROCESSING	2-1-0		
	ITT468	BIO-INFORMATICS	2-1-0		
	ITT478	DEEP LEARNING	2-1-0		

NOTE

- *All Institutions should keep 4 hours exclusively for Remedial class/Minor/Honours course (Mondays from 10 to 12 and Wednesdays from 10 to 12 PM). If a student does not opt for minor/honours programme, he/she can be given remedial class.
- Comprehensive Course Viva:** The comprehensive course viva in the eighth semester of study shall have a viva voce for 50 marks. The viva voce shall be conducted based on the core subjects studied from third to eighth semester. The viva voce will be conducted by the same three member committee assigned for final project phase II evaluation towards the end of the semester. The pass minimum for this course is 25. The course should be mapped with a faculty and classes shall be arranged for practising questions based on the core courses listed in the curriculum. The mark will be treated as internal and should be uploaded along with internal marks of other courses.
- Project Phase II:** The object of Project Work II & Dissertation is to enable the student to extend further the investigative study taken up in Project 1, either fully theoretical/practical or involving both theoretical and practical work, under the guidance of a Supervisor from the Department alone or jointly with a Supervisor drawn from R&D laboratory/Industry. This is expected to provide a good training for the student(s) in R&D work and technical leadership. The assignment to normally include:
 - In depth study of the topic assigned in the light of the Report prepared under Phase I;
 - Review and finalization of the Approach to the Problem relating to the assigned topic;
 - Detailed Analysis/Modelling/Simulation/Design/Problem Solving/Experiment as needed;
 - Final development of product/process, testing, results, conclusions and future directions;

- Preparing a paper for Conference presentation/Publication in Journals, if possible;
- Preparing a Dissertation in the standard format for being evaluated by the Department;
- Final Presentation before a Committee

Total marks: 150, only CIE, minimum required to pass 75

Guide : 30

Interim evaluation, 2 times in the semester by the evaluation committee : 50

Quality of the report evaluated by the above committee : 30

(The evaluation committee comprises HoD or a senior faculty member, Project coordinator and project supervisor).

Final evaluation by a three member committee : 40

(The final evaluation committee comprises Project coordinator, expert from Industry/research Institute and a senior faculty from a sister department. The same committee will conduct comprehensive course viva for 50 marks).

MINOR

Minor is an additional credential a student may earn if s/he does 20 credits worth of additional learning in a discipline other than her/his major discipline of B.Tech. degree. The objective is to permit a student to customize their Engineering degree to suit their specific interests. Upon completion of an Engineering Minor, a student will be better equipped to perform interdisciplinary research and will be better employable. Engineering Minors allow a student to gain interdisciplinary experience and exposure to concepts and perspectives that may not be a part of their major degree programs.

The academic units offering minors in their discipline will prescribe the set of courses and/or other activities like projects necessary for earning a minor in that discipline. A specialist basket of 3-6 courses is identified for each Minor. Each basket may rest on one or more foundation courses. A basket may have sequences within it, i.e., advanced courses may rest on basic courses in the basket. S/he accumulates credits by registering for the required courses, and if the requirements for a particular minor are met within the time limit for the course, the minor will be awarded. This will be mentioned in the Degree Certificate as "Bachelor of Technology in xxx with Minor in yyy". The fact will also be reflected in the consolidated grade card, along with the list of courses taken. If one specified course cannot be earned during the course of the programme, that minor will not be awarded. The individual course credits earned, however, will be reflected in the consolidated grade card.

(i) The curriculum/syllabus committee/BoS shall prepare syllabus for courses to be included in the curriculum from third to eight semesters for all branches. The minor courses shall be identified by **M slot courses**.

(ii) Registration is permitted for Minor at the beginning of third semester. Total credits required is 182 (162 + 20 credits from value added courses)

(iii) Out of the 20 Credits, 12 credits shall be earned by undergoing a minimum of three courses listed in the curriculum for minor, of which one course shall be a mini project based on the chosen area. They can do miniproject either in S7 or in S8. The remaining 8 credits could be acquired by undergoing 2 MOOCs recommended by the Board of studies and approved by the Academic Council or through courses listed in the curriculum. The classes for Minor shall be conducted along with regular classes and no extra time shall be required for conducting the courses.

(iv) There won't be any supplementary examination for the courses chosen for Minor.

(v) On completion of the program, "Bachelor of Technology in xxx with Minor in yyy" will be awarded.

(vi) The registration for minor program will commence from semester 3 and the all academic units offering minors in their discipline should prescribe set of such courses. The courses shall be grouped into maximum of 3 baskets. The basket of courses may have sequences within it, i.e., advanced courses may rest on basic courses in the basket. Reshuffling of courses between various baskets will not be allowed. In any case, they should carry out a mini project based on the chosen area in S7 or S8. Students who have registered for **B.Tech Minor in INFORMATION TECHNOLOGY Branch** can opt to study the courses listed below.

S e m e s t e r	BASKET I WEB AND ANDROID DEVELOPMENT				BASKET II COMPUTER COMMUNICATIONS				BASKET III SOFTWARE ENGINEERING			
	Course No.	Course Name	H O U R S	C R E D I T	Course No.	Course Name	H O U R S	C R E D I T	Course No.	Course Name	H O U R S	C R E D I T
S3	ITT281	JAVA PROGRAMMING	4	4	ITT283	DATA COMMUNICATION	4	4	ITT285	SOFTWARE ENGINEERING	4	4
S4	ITT282	DATABASE MANAGEMENT	4	4	ITT284	COMPUTER NETWORKS	4	4	ITT286	SOFTWARE PROJECT MANAGEMENT TECHNIQUES	4	4
S5	ITT381	WEB APPLICATION DEVELOPMENT	4	4	ITT383	INTERNET TECHNOLOGY	4	4	ITT 385	SOFTWARE ARCHITECTURE CONCEPTS	4	4
S6	ITT382	ANDROID PROGRAMMING	4	4	ITT384	INTERNETWORKING	4	4	ITT386	PRINCIPLES OF SOFTWARE QUALITY ASSURANCE	4	4
S7	ITD481	MINIPROJECT	4	4	ITD481	MINIPROJECT	4	4	ITD481	MINIPROJECT	4	4
S8	ITD482	MINIPROJECT	4	4	ITD482	MINIPROJECT	4	4	ITD482	MINIPROJECT	4	4

HONOURS

Honours is an additional credential a student may earn if s/he opts for the extra 20 credits needed for this in her/his own discipline. Honours is not indicative of class. KTU is providing this option for academically extra brilliant students to acquire Honours. Honours is intended for a student to gain expertise/specialise in an area inside his/her major B.Tech discipline and to enrich knowledge in emerging/advanced areas in the branch of engineering concerned. It is particularly suited for students aiming to pursue higher studies. Upon completion of Honours, a student will be better equipped to perform research in her/his branch of engineering. On successful accumulation of credits at the end of the programme, this will be mentioned in the Degree Certificate as “Bachelor of Technology in xxx, with Honours.” The fact will also be reflected in the consolidated grade card, along with the list of courses taken. If one specified course cannot be earned during the course of the programme, Honours will not be awarded. The individual course credits earned, however, will be reflected in the consolidated grade card.

The courses shall be grouped into maximum of 3 groups, each group representing a particular specialization in the branch. The students shall select only the courses from same group in all semesters. It means that the specialization is to be fixed by the student and cannot be changed subsequently. The internal evaluation, examination and grading shall be exactly as for other mandatory courses. The Honours courses shall be identified by H slot courses.

- (i) The curriculum/syllabus committee/BoS shall prepare syllabus for courses to be included in the curriculum from fourth to eight semesters for all branches. The honours courses shall be identified by H slot courses.
- (ii) Registration is permitted for Honours at the beginning of fourth semester. Total credits required is 182 (162 + 20 credits from value added courses).
- (iii) Out of the 20 Credits, 12 credits shall be earned by undergoing a minimum of three courses listed in the curriculum for honours, of which one course shall be a mini project based on the chosen area. The remaining 8 credits could be acquired by undergoing 2 MOOCs recommended by the Board of studies and approved by the Academic Council or through courses listed in the curriculum. The classes for Honours shall be conducted along with regular classes and no extra time shall be required for conducting the courses. The students should earn a grade of ‘C’ or better for all courses under honours.
- (iv) There won’t be any supplementary examination for the courses chosen for honours.
- (v) On successful accumulation of credits at the end of the programme, “Bachelor of Technology in xxx, with Honours” will be awarded if overall CGPA is greater than or equal to 8.5, earned a grade of ‘C’ or better for all courses chosen for honours and without any history of ‘F’ Grade.
- (vi) The registration for honours program will commence from semester 4 and the all academic units offering honours in their discipline should prescribe set of such

courses. The courses shall be grouped into maximum of 3 groups, each group representing a particular specialization in the branch. The students shall select only the courses from same group in all semesters. It means that the specialization is to be fixed by the student and cannot be changed subsequently. In any case, they should carry out a mini project based on the chosen area in S8. Students who have registered for **B.Tech Honours in INFORMATION TECHNOLOGY** can opt to study the courses listed below.

S e m e s t e r	GROUP I				GROUP II				GROUP III			
	Course No	Course Name	H O U R S	C R E D I T	Course No	Course Name	H O U R S	C R E D I T	Course No	Course Name	H O U R S	C R E D I T
S4	ITT292	MATHEMATICAL FOUNDATION FOR NETWORKING	4	4	ITT294	NUMBER THEORY	4	4	ITT296	MICROPROCESSOR AND MICROCONTROLLER PROGRAMMING	4	4
S5	ITT393	WIRELESS COMMUNICATION	4	4	ITT395	SECURITY IN COMPUTING	4	4	ITT397	ADVANCED COMPUTER ARCHITECTURE	4	4
S6	ITT394	DESIGN AND ANALYSIS OF NETWORKS	4	4	ITT396	APPLIED COMPUTER SECURITY	4	4	ITT398	EMBEDDED SYSTEM	4	4
S7	ITT495	ENTERPRISE NETWORKS	4	4	ITT497	WEB SECURITY	4	4	ITT499	ROBOTICS AND AUTOMATION	4	4
S8	ITD496	MINIPROJECT	4	4	ITD496	MINIPROJECT	4		ITD496	MINIPROJECT	4	4

INDUCTION PROGRAM

There will be three weeks induction program for first semester students. It is a unique three-week immersion Foundation Programme designed especially for the fresher's which includes a wide range of activities right from workshops, lectures and seminars to sports tournaments, social work and much more. The programme is designed to mould students into well-rounded individuals, aware and sensitized to local and global conditions and foster their creativity, inculcate values and ethics, and help students to discover their passion. Foundation Programme also serves as a platform for the fresher's to interact with their batchmates and seniors and start working as a team with them. The program is structured around the following five themes:

The programme is designed keeping in mind the following objectives:

- **Values and Ethics:** Focus on fostering a strong sense of ethical judgment and moral fortitude.

- **Creativity:** Provide channels to exhibit and develop individual creativity by expressing themselves through art, craft, music, singing, media, dramatics, and other creative activities.
- **Leadership, Communication and Teamwork:** Develop a culture of teamwork and group communication.
- **Social Awareness:** Nurture a deeper understanding of the local and global world and our place in it as concerned citizens of the world.
- **Physical Activities & Sports:** Engage students in sports and physical activity to ensure healthy physical and mental growth.





VISWAJYOTHI COLLEGE OF ENGINEERING & TECHNOLOGY

(Approved by AICTE, Affiliated to APJ Abdul Kalam Technological University, Kerala)

Vazhakulam P.O., Muvattupuzha, Ernakulam Dist., Kerala, India - 686 670

Ph: 0485 2262211, 2262244, 2262255, 2262977, Fax : 0485 2262211

Web : www.vjcet.ac.in E-mail : vjcet@vjcet.org, vjcvtkm@gmail.com



All B.Tech Programmes (CE, CSE, ECE, EEE, IT & ME) Accredited by NBA

Date : 28/04/2021

Self Declaration

Subject: Reference to metric number 1.3.2. Experiential learning courses in the curriculum apart from Project work/ Internship/ field work

In Mechanical Engineering, for undergraduate programme, semesters from 1 to 6 consists of 8 courses out of which 2 are laboratory courses and semester 7 consists of 1 laboratory course as per APJ Abdul Kalam Technological University in addition to project work/Internships/Field work. In MG university, for undergraduate programme, semesters from 1 to 7 consists of 8 courses out of which 2 are laboratory courses and semester 8 consists of 1 laboratory course. In Mtech in Industrial engineering and management, semesters 1 and 2 consists of 1 laboratory course as per APJ Abdul Kalam Technological University. In laboratory courses, students undergo experiential learning related to one or more theory courses. Thus each student goes through more than 30% of experiential learning in each semester.



Dr. K.K. Rajan

Principal

Viswajyothi College of Engineering & Technology
Vazhakulam P.O., Muvattupuzha, Kerala-686 670

Note: Sample copy of scheme and syllabus is enclosed along with this letter.

Mahatma Gandhi University Revised Scheme For
B Tech Syllabus Revision 2010 (Mechanical Engineering)

Common for All Branches
SCHEME S1&S2

Code	Subject	Hours/week			Marks		End-sem duration- hours	Credits
		L	T	P/D	Internal	End-sem		
EN010 101	Engineering Mathematics I	2	1	-	50	100	3	5
EN010 102	Engineering Physics	1	1	-	50	100	3	4
EN010 103	Engineering. Chemistry & Environmental Studies	1	1	-	50	100	3	4
EN010 104	Engineering Mechanics	3	1	-	50	100	3	6
EN010 105	Engineering Graphics	1	3	-	50	100	3	6
EN010 106	Basic Civil Engineering	1	1	-	50	100	3	4
EN010 107	Basic Mechanical Engineering	1	1	-	50	100	3	4
EN010 108	Basic Electrical Engineering	1	1	-	50	100	3	4
EN010 109	Basic Electronics Engineering. & Information Technology	2	1	-	50	100	3	5
EN010 110	Mechanical Workshop	-	-	3	50	-	3	1
EN110 111	Electrical and Civil Workshops	-	-	3	100	-	3	1
	Total	13	11	6			30	44

3rd Semester

Code	Subject	Hours/week			Marks		End-sem duration	Credits
		L	T	P/D	Internal	End-sem		
EN010 301A	Engineering Mathematics II	2	2	-	50	100	3	4
EN010 302	Economics and Communication Skills	2	2	-	50	100	3	4 (3+1)
ME010 303	Fluid Mechanics	2	2	-	50	100	3	4
ME 010 304	Metallurgy & Material Science	3	1	-	50	100	3	4
ME 010 305	Programming in C	3	1	-	50	100	3	4
ME 010 306(CE)	Strength of Materials & Structural Engineering	3	1	-	50	100	3	4
ME 010 307	Computer Programming Lab	-	-	3	50	100	3	2
ME 010 308	Fluid Mechanics Lab	-	-	3	50	100	3	2
	Total	15	9	6				28

4th Semester

Code	Subject	Hours/week			Marks		End-sem duration- hours	Credits
		L	T	P/D	Internal	End-sem		
EN010 401	Engineering Mathematics III	2	2	-	50	100	3	4
EN010 402(ME)	Principles of Management	3	1	-	50	100	3	4
ME 010 403	Hydraulic Machines	2	2	-	50	100	3	4
ME 010 404	Manufacturing Process	3	1	-	50	100	3	4
ME 010 405	Machine Drawing			4	50	100	3	4
ME 010 406(E)	Electrical Technology	3	1	-	50	100	3	4
ME 010 407	Hydraulic Machines Lab	-	-	3	50	100	3	2
ME 010 408(CE)	Strength of Materials Lab	-	-	3	50	100	3	2
	Total	16	8	6				28

5th Semester

Code	Subject	Hours/week			Marks		End-sem duration- hours	Credits
		L	T	P/D	Internal	End-sem		
EN010 501A	Engineering Mathematics IV	2	2	-	50	100	3	4
ME 010 502	Computer Aided Design & Manufacturing	3	1		50	100	3	4
ME 010 503	Advanced Mechanics of Materials	2	2	-	50	100	3	4
ME 010 504	Kinematics of Machinery	3	1	-	50	100	3	4
ME 010 505	I.C.Engines & Combustion	3	1	-	50	100	3	4
ME 010 506	Thermodynamics	3	1	-	50	100	3	4
ME 010 507	CAD/CAM Lab	-	-	3	50	100	3	2
ME 010 508	Electrical & Electronics Lab	-	-	3	50	100	3	2
	Total	16	8	6				28

6th Semester

Code	Subject	Hours/week			Marks		End-sem duration	Credits
		L	T	P/D	Internal	End-sem		
ME 010 601	Mechanics of Machines	2	2	-	50	100	3	4
ME 010 602	Heat & Mass transfer	2	2	-	50	100	3	4
ME 010 603	Thermal Systems & Applications	3	1	-	50	100	3	4
ME 010 604	Metrology & Machine Tools	3	1	-	50	100	3	4
ME 010 605	Mechatronics & Control System	3	1	-	50	100	3	4
ME 010 606Lxx	Elective I	2	2	-	50	100	3	4
ME 010 607	Heat Engines Lab	-	-	3	50	100	3	2
ME 010 608	Machine Tools Lab	-	-	3	50	100	3	2
	Total	15	9	6				28

Elective I

ME 010 606L01 Computational Fluid Dynamics
 ME 010 606L02 Composite Materials Technology
 ME 010 606L03 Automobile engineering
 ME 010 606L04 Advanced strength of materials
 ME 010 606L05 Industrial Hydraulics
 ME 010 606L06 Project management

7th Semester

Code	Subject	Hours/week			Marks		End-sem duration -hours	Credits
		L	T	P/D	Internal	End-sem		
ME 010 701	Design of Machine Elements	2	1	1	50	100	3	4
ME 010 702	Dynamics of Machines	2	2	-	50	100	3	4
ME 010 703	Gas Dynamics & Jet Propulsion	2	1	-	50	100	3	3
ME 010 704	Refrigeration & Air Conditioning	2	1	-	50	100	3	3
ME 010 705	Industrial Engineering	2	1	-	50	100	3	3
ME 010 706Lxx	Elective II	2	2	-	50	100	3	4
ME 010 707	Mechanical Measurements Lab	-	-	3	50	100	3	2
ME 010 708	Advanced Machine Tools Lab	-	-	3	50	100	3	2
ME 010 709	Seminar	-	-	2	50	-	-	2
ME 010 710	Project	-	-	1	50	-	-	1
	Total	12	8	10				28

Elective II

ME010 706L01 Plant Engineering & Maintenance
 ME010 706L02 Turbomachines
 ME010 706L03 Theory of vibration
 ME010 706L04 Sales & Marketing Management
 ME010 706L05 Failure analysis & design
 ME010 706L06 Foundry & Welding Technology

8th Semester

Code	Subject	Hours/week			Marks		End-sem duration- hours	Credits
		L	T	P/D	Internal	End-sem		
ME010 801	Design of Transmission Elements	2	2	1	50	100	3	4
ME010 802	Operations Management	2	2	-	50	100	3	4
ME010 803	Production Engineering	2	2	-	50	100	3	4
ME010 804Lxx	Elective III	2	2	-	50	100	3	4
ME010 805Gxx	Elective IV	2	2	-	50	100	3	4
ME010 806	Mechanical Systems Lab	-	-	3	50	100	3	2
ME010 807	Project	-	-	6	100	-	-	4
ME010 808	Viva Voce	-	-	-	-	50	-	2
	Total	10	10	10				28

Electives III

ME010 804L01 Aerospace Engineering
ME010 804L02 Advanced Machining Process
ME010 804L03 Cryogenics
ME010 804L04 Acoustics & noise control
ME010 804L05 Non Destructive Testing
ME010 804L06 Advance operations research

Electives IV

ME010 805G01 Industrial Safety
ME010 805G02 Disaster Management
ME010 805G03 Nano Technology
ME010 805G04 Finite element analysis
ME010 805G05 Optimization methods in design
ME010 805G06 Petrochemical Engineering



KERALA TECHNOLOGICAL UNIVERSITY

Curriculum for Semesters I and II

2015

Kerala Technological University
CET Campus, Thiruvananthapuram
Kerala -695016 India
Phone +91 471 2598122, 2598422
Fax +91 471 2598522
Web: ktu.edu.in
Email: university@ktu.edu.in

SEMESTER I

Slot	Course No.	Subject	L-T-P	Hours	Credits
A	MA101	Calculus	3-1-0	4	4
B (1/2)	PH100	Engineering Physics	3-1-0	4	4
	CY100	Engineering Chemistry	3-1-0	4	4
C (1/2)	BE100	Engineering Mechanics	3-1-0	4	4
	BE110	Engineering Graphics	1-1-2	4	3
D	BE101-0X	Introduction to _____ Engineering	2-1-0	3	3
E	BE103	Introduction to Sustainable Engineering	2-0-1	3	3
F (1/4)	CE100	Basics of Civil Engineering	2-1-0	3	3
	ME100	Basics of Mechanical Engineering	2-1-0	3	3
	EE100	Basics of Electrical Engineering	2-1-0	3	3
	EC100	Basics of Electronics Engineering	2-1-0	3	3
S (1/2)	PH110	Engineering Physics Lab	0-0-2	2	1
	CY110	Engineering Chemistry Lab	0-0-2	2	1
T (2/4)	CE110/ME110/ EE110/EC110/ CS110/CH110	Basic Engineering Workshops (CS110 for CS and related branches and CH110 for CH and related branches only)	0-0-2 + 0-0-2	2 2	1 1
U		U100 Language lab/ Bridge courses/ Remedial programmes/Micro Projects etc	0-0-3	3	
				30	24/23
V		V100 Entrepreneurship/TBI/NCC/NSS/ Physical Edn. etc	0-0-2	2	Activity points

SEMESTER II

Slot	Course No.	Subject	L-T-P	Hours	Credits
A	MA102	Differential Equations	3-1-0	4	4
B (1/2)	PH100	Engineering Physics	3-1-0	4	4
	CY100	Engineering Chemistry	3-1-0	4	4
C (1/2)	BE100	Engineering Mechanics	3-1-0	4	4
	BE110	Engineering Graphics	1-1-2	4	3
D	BE102	Design & Engineering	2-0-2	4	3
E, F (2/4)	CE 100	Basics of Civil Engineering	2-1-0	3	3
	ME 100	Basics of Mechanical Engineering	2-1-0	3	3
	EE 100	Basics of Electrical Engineering	2-1-0	3	3
	EC 100	Basics of Electronics Engineering	2-1-0	3	3
S (1/2)	PH110	Engineering Physics Lab	0-0-2	2	1
	CY110	Engineering Chemistry Lab	0-0-2	2	1
T (2/4)	CE110/ME110/ EE110/EC110	Basic Engineering Workshops	0-0-2	2	1
			+ 0-0-2	2	1
U		U100 Language lab / Bridge courses/ Remedial programmes/Micro Projects etc	0-0-2	2	
				30	24/23
V		V100 Entrepreneurship /TBI/NCC/NSS/ Physical Edn. etc	0-0-2	2	Activity points

Note: 1. Institutions can assign **two of four** Basics of Engineering courses not already taken by the student in the previous semester and the corresponding Workshop courses in Semester 2.



APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

**Curriculum
for
B.Tech Degree
Semesters III to VIII
2016**

Mechanical Engineering

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

CET CAMPUS, THIRUVANANTHAPURAM – 695016

KERALA, INDIA

Phone +91 471 2598122, 2598422

Fax +91 471 2598522 Web: ktu.edu.in

Email: university@ktu.edu.in

BRANCH: *Mechanical Engineering*

SEMESTER - 3

Course Code	Course Name	L-T-P	Credits	Exam Slot
MA201	Linear Algebra & Complex Analysis	3-1-0	4	A
ME201	Mechanics of Solids	3-1-0	4	B
ME203	Mechanics of Fluids	3-1-0	4	C
ME205	Thermodynamics	3-1-0	4	D
ME210	Metallurgy & Materials Engineering	3-0-0	3	E
HS200/ HS210	Business Economics/Life Skills	3-0-0/ 2-0-2	3	F
ME231	Computer Aided Machine Drawing Lab	0-0-3	1	S
CE230	Material Testing Lab	0-0-3	1	T

Total Credits = 24

Hours: 28/29

Cumulative Credits= 71

SEMESTER - 4

Course Code	Course Name	L-T-P	Credits	Exam Slot
MA202	Probability Distributions, Transforms and Numerical Methods	3-1-0	4	A
ME202	Advanced Mechanics of Solids	3-1-0	4	B
ME204	Thermal Engineering	3-1-0	4	C
ME206	Fluid Machinery	2-1-0	3	D
ME220	Manufacturing Technology	3-0-0	3	E
HS210/ HS200	Life Skills/Business Economics	2-0-2/ 3-0-0	3	F
ME232	Thermal Engineering Lab	0-0-3	1	S
ME230	Fluid Mechanics & Machines Lab	0-0-3	1	T

Total Credits = 23

Hours 28/27

Cumulative Credits= 94

BRANCH: *Mechanical Engineering*

SEMESTER - 5

Course Code	Course Name	L-T-P	Credits	Exam Slot
ME301	Mechanics of Machinery	3-1-0	4	A
ME303	Machine Tools and Digital Manufacturing	3-0-0	3	B
ME305	Computer Programming & Numerical Methods	2-0-1	3	C
EE311	Electrical Drives & Control for Automation	3-0-0	3	D
HS300	Principles of Management	3-0-0	3	E
	Elective 1	3-0-0	3	F
ME341	Design Project	0-1-2	2	S
EE335	Electrical and Electronics Lab	0-0-3	1	T
ME331	Manufacturing Technology Lab I	0-0-3	1	U

Total Credits = 23

Hours: 28

Cumulative Credits= 117

- Elective 1:-**
1. ME361 Advanced Fluid Mechanics
 2. ME363 Composite Materials and Mechanics
 3. ME365 Advanced Metal Casting
 4. ME367 Non-Destructive Testing
 5. ME369 Tribology
 6. ME371 Nuclear Engineering
 7. ME373 Human Relations Management

BRANCH: *Mechanical Engineering*

SEMESTER - 6

Course Code	Course Name	L-T-P	Credits	Exam Slot
ME302	Heat & Mass Transfer	3-1-0	4	A
ME304	Dynamics of Machinery	2-1-0	3	B
ME306	Advanced Manufacturing Technology	3-0-0	3	C
ME308	Computer Aided Design and Analysis	3-0-0	3	D
ME312	Metrology and Instrumentation	3-0-0	3	E
	Elective 2	3-0-0	3	F
ME332	Computer Aided Design and Analysis Lab	0-0-3	1	S
ME334	Manufacturing Technology Lab II	0-0-3	1	T
ME352	Comprehensive Exam	0-1-1	2	U

Total Credits = 23

Hours: 27

Cumulative Credits= 140

Elective 2:-

1. ME362 Control System Engineering
2. ME364 Turbo Machinery
3. ME366 Advanced Metal Joining Technology
4. ME368 Marketing Management
5. ME372 Operations Research
6. ME374 Theory of Vibration
7. ME376 Maintenance Engineering

BRANCH: *Mechanical Engineering*

SEMESTER - 7

Course Code	Course Name	L-T-P	Credits	Exam Slot
ME401	Design of Machine Elements I	3-1-0	4	A
ME403	Advanced Energy Engineering	3-0-0	3	B
ME405	Refrigeration and Air Conditioning	2-1-0	3	C
ME407	Mechatronics	3-0-0	3	D
ME409	Compressible Fluid Flow	2-1-0	3	E
	Elective 3	3-0-0	3	F
ME451	Seminar & Project Preliminary	0-1-4	2	S
ME431	Mechanical Engineering Lab	0-0-3	1	T

Total Credits = 22**Hours: 27****Cumulative Credits= 162****Elective 3:-**

1. ME461 Aerospace Engineering
2. ME463 Automobile Engineering
3. ME465 Industrial Hydraulics
4. IE306 Supply Chain and Logistics Management
5. ME467 Cryogenic Engineering
6. ME469 Finite Element Analysis
7. ME471 Optimization Techniques

BRANCH: *Mechanical Engineering***SEMESTER - 8**

Course Code	Course Name	L-T-P	Credits	Exam Slot
ME402	Design of Machine Elements II	3-0-0	3	A
ME404	Industrial Engineering	3-0-0	3	B
	Elective 4	3-0-0	3	C
	Elective 5 (Non Departmental)	3-0-0	3	D
ME492	Project		6	S

Total Credits = 18**Hours: 30****Cumulative Credits= 180****Elective 4:-**

1. ME462 Propulsion Engineering
2. ME464 Robotics and Automation
3. ME466 Computational Fluid Dynamics
4. ME468 Nanotechnology
5. ME472 Failure Analysis and Design
6. ME474 Micro and Nano Manufacturing
7. ME476 Material Handling & Facilities Planning

ELECTIVE 5 (NON DEPARTMENTAL ELECTIVE COURSES)

(Note:- If a student has studied or chosen the elective course given within the brackets then the corresponding ND elective cannot be chosen)

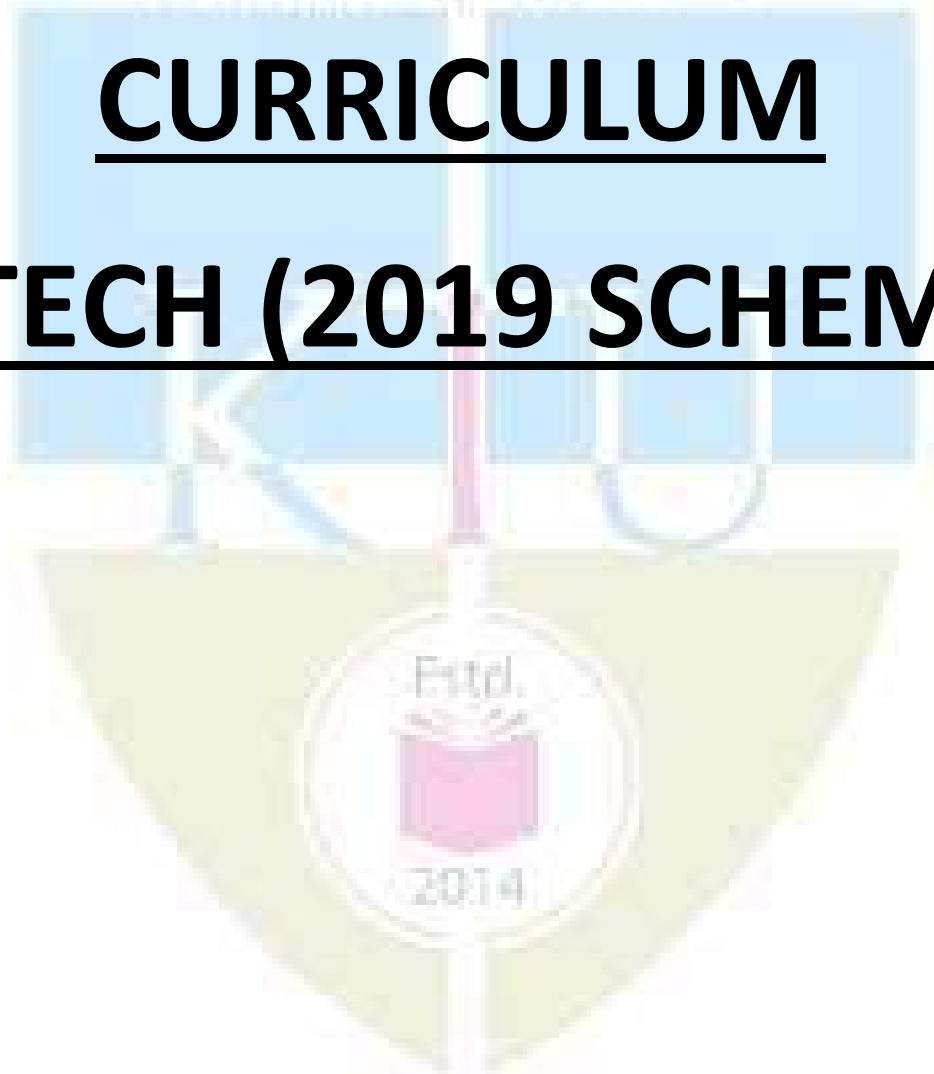
1. AO482 FLIGHT AGAINST GRAVITY
2. AE482 INDUSTRIAL INSTRUMENTATION
3. AE484 INSTRUMENTATION SYSTEM DESIGN
4. AU484 MICROPROCESSOR AND EMBEDDED SYSTEMS
5. AU486 NOISE, VIBRATION AND HARSHNESS
6. BM482 BIOMEDICAL INSTRUMENTATION
7. BM484 MEDICAL IMAGING & IMAGE PROCESSING TECHNIQUES
8. BT461 DESIGN OF BIOLOGICAL WASTEWATER SYSTEMS
9. BT362 SUSTAINABLE ENERGY PROCESSES
10. CH482 PROCESS UTILITIES AND PIPE LINE DESIGN
11. CH484 FUEL CELL TECHNOLOGY
12. CE482 ENVIRONMENTAL IMPACT ASSESSMENT
13. CE484 APPLIED EARTH SYSTEMS
14. CE486 GEO INFORMATICS FOR INFRASTRUCTURE MANAGEMENT
15. CE488 DISASTER MANAGEMENT
16. CE494 ENVIRONMENT HEALTH AND SAFETY
17. CS482 DATA STRUCTURES
18. CS484 COMPUTER GRAPHICS
19. CS486 OBJECT ORIENTED PROGRAMMING
20. CS488 C # AND .NET PROGRAMMING
21. EE484 CONTROL SYSTEMS (ME 362/ CONTROL SYSTEM ENGINEERING)
22. EE486 SOFT COMPUTING

23. EE488	INDUSTRIAL AUTOMATION (ME464/ ROBOTICS AND AUTOMATION)
24. EE494	INSTRUMENTATION SYSTEMS
25. EC482	BIOMEDICAL ENGINEERING
26. FT482	FOOD PROCESS ENGINEERING
27. FT484	FOOD STORAGE ENGINEERING
28. FT486	FOOD ADDITIVES AND FLAVOURING
29.IE482	FINANCIAL MANAGEMENT
30. IE484	INTRODUCTION TO BUSINESS ANALYTICS
31.IE486	DESIGN AND ANALYSIS OF EXPERIMENTS
32. IE488	TOTAL QUALITY MANAGEMENT
33.IC482	BIOMEDICAL SIGNAL PROCESSING
34. IT482	INFORMATION STORAGE MANAGEMENT
35. MA482	APPLIED LINEAR ALGEBRA
36. MA484	OPERATIONS RESEARCH (ME 372/ OPERATIONS RESEARCH)
37. MA486	ADVANCED NUMERICAL COMPUTATIONS
38. MA488	CRYPTOGRAPHY
39.MP482	PRODUCT DEVELOPMENT AND DESIGN
40. MP469	INDUSTRIAL PSYCHOLOGY & ORGANIZATIONAL BEHAVIOUR
41. MP484	PROJECT MANAGEMENT
42. MT482	INDUSTRIAL SAFETY
43. FS482	RESPONSIBLE ENGINEERING
44. SB482	DREDGERS AND HARBOUR CRAFTS
45. HS482	PROFESSIONAL ETHICS

AMU ABDUL KALAM
TECHNOLOGICAL
UNIVERSITY

CURRICULUM

B.TECH (2019 SCHEME)



CURRICULUM I TO VIII: B. TECH MECHANICAL ENGINEERING

Every course of B. Tech. Program shall be placed in one of the nine categories as listed in table below.

Sl. No	Category	Code	Credits
1	Humanities and Social Sciences including Management courses	HMC	8
2	Basic Science courses	BSC	26
3	Engineering Science Courses	ESC	22
4	Program Core Courses	PCC	76
5	Program Elective Courses	PEC	15
6	Open Elective Courses	OEC	3
7	Project work and Seminar	PWS	10
8	Mandatory Non-credit Courses (P/F) with grade	MNC	-----
9	Mandatory Student Activities (P/F)	MSA	2
Total Mandatory Credits		162	
10	Value Added Course (Optional)	VAC	20

No semester shall have more than six lecture-based courses and two laboratory and/or drawing/seminar/project courses in the curriculum. Semester-wise credit distribution shall be as below:

Sem	1	2	3	4	5	6	7	8	Total
Credits	17	21	22	22	23	23	15	17	160
Activity Points	50				50				---
Credits for Activity	2								2
G.Total									162

Basic Science Courses: Maths, Physics, Chemistry, Biology for Engineers, Life Science etc

Engineering science courses: Basic Electrical, Engineering Graphics, Programming, Workshop, Basic Electronics, Basic Civil, Engineering Mechanics, Mechanical Engineering, Thermodynamics, , Design Engineering, Materials Engineering etc.

Humanities and Social Sciences including Management courses: English, Humanities, Professional Communication, Management, Finance & Accounting, Life Skills, Professional Communication, Economics etc.

Mandatory non-credit courses: Sustainable Engineering, Constitution of India/Essence of Indian Knowledge Tradition, Industrial Safety Engineering, disaster management etc.

Course Code and Course Number

Each course is denoted by a unique code consisting of three alphabets followed by three numerals like **ECL201**. The first two letter code refers to the department offering the course. EC stands for course in Electronics & Communication, course code MA refers to a course in Mathematics, course code ES refers to a course in Engineering Science etc. Third letter stands for the nature of the course as indicated in the Table 1.

Table 1: Code for the courses

Code	Description
T	Theory based courses (other the lecture hours, these courses can have tutorial and practical hours, e.g., L-T-P structures 3-0-0, 3-1-2, 3-0-2 etc.)
L	Laboratory based courses (where performance is evaluated primarily on the basis of practical or laboratory work with LTP structures like 0-0-3, 1-0-3, 0-1-3 etc.)
N	Non-credit courses
D	Project based courses (Major, Mini Projects)
Q	Seminar Courses

Course Number is a three digit number and the first digit refers to the Academic year in which the course is normally offered, i.e. 1, 2, 3, or 4 for the B. Tech. Programme of four year duration. Of the other two digits, the last digit identifies whether the course is offered normally in the odd (odd number), even (even number) or in both the semesters (zero). The middle number could be any digit. ECL 201 is a laboratory course offered in EC department for third semester, MAT 101 is a course in Mathematics offered in the first semester, EET 344 is a course in Electrical Engineering offered in the sixth semester, PHT 110 is a course in Physics offered both the first and second semesters, EST 102 is a course in Basic Engineering offered by one or many departments. These course numbers are to be given in the curriculum and syllabi.

Departments

Each course is offered by a Department and their two-letter course prefix is given in Table 2.

Table 2: Departments and their codes

Sl.No	Department	Course Prefix	Sl.No	Department	Course Prefix
01	Aeronautical Engg	AO	16	Information Technology	IT
02	Applied Electronics & Instrumentation	AE	17	Instrumentation & Control	IC
03	Automobile	AU	18	Mandatory Courses	MC
04	Biomedical Engg	BM	19	Mathematics	MA
05	Biotechnology	BT	20	Mechanical Engg	ME
06	Chemical Engg	CH	21	Mechatronics	MR
07	Chemistry	CY	22	Metallurgy	MT
08	Civil Engg	CE	23	Mechanical (Auto)	MU
09	Computer Science	CS	24	Mechanical(Prod)	MP
10	Electrical & Electronics	EE	25	Naval & Ship Building	SB
11	Electronics & Biomedical	EB	26	Physics	PH
12	Electronics & Communication	EC	27	Polymer Engg	PO
13	Food Technology	FT	28	Production Engg	PE
14	Humanities	HU	29	Robotics and Automation	RA
15	Industrial Engg	IE	30	Safety & Fire Engg	FS

SEMESTER I

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	MAT 101	LINEAR ALGEBRA AND CALCULUS	3-1-0	4	4
B 1/2	PHT 110	ENGINEERING PHYSICS B	3-1-0	4	4
	CYT 100	ENGINEERING CHEMISTRY	3-1-0	4	4
C 1/2	EST 100	ENGINEERING MECHANICS	2-1-0	3	3
	EST 110	ENGINEERING GRAPHICS	2-0-2	4	3
D 1/2	EST 120	BASICS OF CIVIL & MECHANICAL ENGINEERING	4-0-0	4	4
	EST 130	BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING	4-0-0	4	4
E	HUT 101	LIFE SKILLS	2-0-2	4	--
S 1/2	PHL 120	ENGINEERING PHYSICS LAB	0-0-2	2	1
	CYL 120	ENGINEERING CHEMISTRY LAB	0-0-2	2	1
T 1/2	ESL 120	CIVIL & MECHANICAL WORKSHOP	0-0-2	2	1
	ESL 130	ELECTRICAL & ELECTRONICS WORKSHOP	0-0-2	2	1
TOTAL				23/24 *	17

*Minimum hours per week

NOTE:

To make up for the hours lost due to induction program, one extra hour may be allotted to each course

SEMESTER II

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	MAT 102	VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TRANSFORMS	3-1-0	4	4
B 1/2	PHT 110	ENGINEERING PHYSICS B	3-1-0	4	4
	CYT 100	ENGINEERING CHEMISTRY	3-1-0	4	4
C 1/2	EST 100	ENGINEERING MECHANICS	2-1-0	3	3
	EST 110	ENGINEERING GRAPHICS	2-0-2	4	3
D 1/2	EST 120	BASICS OF CIVIL & MECHANICAL ENGINEERING	4-0-0	4	4
	EST 130	BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING	4-0-0	4	4
E	HUT 102	PROFESSIONAL COMMUNICATION	2-0-2	4	--
F	EST 102	PROGRAMMING IN C	2-1-2	5	4
S 1/2	PHL 120	ENGINEERING PHYSICS LAB	0-0-2	2	1
	CYL 120	ENGINEERING CHEMISTRY LAB	0-0-2	2	1
T 1/2	ESL 120	CIVIL & MECHANICAL WORKSHOP	0-0-2	2	1
	ESL 130	ELECTRICAL & ELECTRONICS WORKSHOP	0-0-2	2	1
TOTAL				28/29	21

NOTE:

1. Engineering Physics B and Engineering Chemistry shall be offered in both semesters. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Engineering Physics B in S1 and Engineering Chemistry in S2 & vice versa. Students opting for Engineering Physics B in a semester should attend Physics Lab in the same semester and students opting for Engineering Chemistry in one semester should attend Engineering Chemistry Lab in the same semester.
2. Engineering Mechanics and Engineering Graphics shall be offered in both semesters. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Engineering Mechanics in S1 and Engineering Graphics in S2 & vice versa.

3. Basics of Civil & Mechanical Engineering and Basics of Electrical & Electronics Engineering shall be offered in both semesters. Basics of Civil & Mechanical Engineering contain equal weightage for Civil Engineering and Mechanical Engineering. Slot for the course is D with CIE marks of 25 each and ESE marks of 50 each. Students belonging to branches of AEI, EI, BME, ECE, EEE, ICE, CSE, IT, RA can choose this course in S1.

Basics of Electrical & Electronics Engineering contain equal weightage for Electrical Engineering and Electronics Engineering. Slot for the course is D with CIE marks of 25 each and ESE marks of 50 each. Students belonging to AERO, AUTO, CE, FSE, IE, ME, MECHATRONICS, PE, METTULURGY, BT, BCE, CHEM, FT, POLY can choose this course in S1. Students having Basics of Civil & Mechanical Engineering in one semester should attend Civil & Mechanical Workshop in the same semester and students having Basics of Electrical & Electronics Engineering in a semester should attend Electrical & Electronics Workshop in the same semester.

4. LIFE SKILLS

Life skills are those competencies that provide the means for an individual to be resourceful and positive while taking on life's vicissitudes. Development of one's personality by being aware of the self, connecting with others, reflecting on the abstract and the concrete, leading and generating change, and staying rooted in time-tested values and principles is being aimed at. This course is designed to enhance the employability and maximize the potential of the students by introducing them to the principles that underlie personal and professional success, and help them acquire the skills needed to apply these principles in their lives and careers.

5. PROFESSIONAL COMMUNICATION

Objective is to develop in the under-graduate students of engineering a level of competence in English required for independent and effective communication for their professional needs. Coverage: Listening, Barriers to listening, Steps to overcome them, Purposive listening practice, Use of technology in the professional world. Speaking, Fluency & accuracy in speech, Positive thinking, Improving self-expression, Tonal variations, Group discussion practice, Reading, Speed reading practice, Use of extensive readers, Analytical and critical reading practice, Writing Professional Correspondence, Formal and informal letters, Tone in formal writing, Introduction to reports. Study Skills, Use of dictionary, thesaurus etc., Importance of contents page, cover & back pages, Bibliography, Language Lab.

SEMESTER III

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	MAT201	PARTIAL DIFFERENTIAL EQUATION AND COMPLEX ANALYSIS	3-1-0	4	4
B	MET201	MECHANICS OF SOLIDS	3-1-0	4	4
C	MET203	MECHANICS OF FLUIDS	3-1-0	4	4
D	MET205	METALLURGY & MATERIAL SCIENCE	3-1-0	4	4
E 1/2	EST200	DESIGN AND ENGINEERING	2-0-0	2	2
	HUT200	PROFESSIONAL ETHICS	2-0-0	2	2
F	MCN201	SUSTAINABLE ENGINEERING	2-0-0	2	--
S	MEL201	COMPUTER AIDED MACHINE DRAWING	0-0-3	3	2
T	MEL203	MATERIALS TESTING LAB	0-0-3	3	2
R/M	VAC	REMEDIAL/MINOR COURSE	3-1-0	4**	4
TOTAL				26/30	22/26

NOTE:

1. Design & Engineering and Professional Ethics shall be offered in both S3 and S4. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Design & Engineering in S3 and Professional Ethics in S4 & vice versa.
2. *All Institutions shall keep 4 hours exclusively for Remedial class/Minor course (Thursdays from 3 to 5 PM and Fridays from 2 to 4 PM). If a student does not opt for minor programme, he/she can be given remedial class.

SEMESTER IV

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	MAT202	PROBABILITY, STATISTICS AND NUMERICAL METHODS	3-1-0	4	4
B	MET202	ENGINEERING THERMODYNAMICS	3-1-0	4	4
C	MET204	MANUFACTURING PROCESS	3-1-0	4	4
D	MET206	FLUID MACHINERY	3-1-0	4	4
E 1/2	EST200	DESIGN AND ENGINEERING	2-0-0	2	2
	HUT200	PROFESSIONAL ETHICS	2-0-0	2	2
F	MCN202	CONSTITUTION OF INDIA	2-0-0	2	--
S	MEL202	FM & HM LAB	0-0-3	3	2
T	MEL204	MACHINE TOOLS LAB-I	0-0-3	3	2
R/M/ H	VAC	REMEDIAL/MINOR/HONORS COURSE	3-1-0	4*	4
TOTAL				26/30	22/26

NOTE:

1. Design & Engineering and Professional Ethics shall be offered in both S3 and S4. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Design & Engineering in S3 and Professional Ethics in S4 & vice versa.
2. *All Institutions should keep 4 hours exclusively for Remedial class/Minor course (Thursdays from 3 to 5 PM and Fridays from 2 to 4 PM). If a student does not opt for minor programme, he/she can be given remedial class.

SEMESTER V

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDI T
A	MET301	MECHANICS OF MACHINERY	3-1-0	4	4
B	MET303	THERMAL ENGINEERING	3-1-0	4	4
C	MET305	INDUSTRIAL & SYSTEMS ENGINEERING	3-1-0	4	4
D	MET307	MACHINE TOOLS AND METROLOGY	3-1-0	4	4
E 1/2	HUT300	INDUSTRIAL ECONOMICS AND FOREIGN TRADE	3-0-0	3	3
	HUT310	MANAGEMENT FOR ENGINEERS	3-0-0	3	3
F	MCN301	DISASTER MANAGEMENT	2-0-0	2	--
S	MEL331	MACHINE TOOLS LAB-II	0-0-3	3	2
T	MEL333	THERMAL ENGINEERING LAB-I	0-0-3	3	2
R/M/H	VAC	REMEDIAL/MINOR/HONORS COURSE	3-1-0	4*	4
TOTAL				27/31	23/27

NOTE:

1. Industrial Economics & Foreign Trade and Management for Engineers shall be offered in both S5 and S6. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Industrial Economics & Foreign Trade in S5 and Management for Engineers in S6 and vice versa.
2. *All Institutions should keep 4 hours exclusively for Remedial class/Minor/Honours course (Tuesdays from 3 to 5 PM and Wednesdays from 3 to 5 PM). If a student does not opt for minor/honours programme, he/she can be given remedial class.

SEMESTER VI

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	MET302	HEAT & MASS TRANSFER	3-1-0	4	4
B	MET304	DYNAMICS OF MACHINERY & MACHINE DESIGN	3-1-0	4	4
C	MET306	ADVANCED MANUFACTURING ENGINEERING	3-1-0	4	4
D	METXXX	PROGRAM ELECTIVE I	2-1-0	3	3
E ½	HUT300	INDUSTRIAL ECONOMICS AND FOREIGN TRADE	3-0-0	3	3
	HUT310	MANAGEMENT FOR ENGINEERS	3-0-0	3	3
F	MET308	COMPREHENSIVE COURSE WORK	1-0-0	1	1
S	MEL332	COMPUTER AIDED DESIGN & ANALYSIS LAB	0-0-3	3	2
T	MEL334	THERMAL ENGINEERING LAB-II	0-0-3	3	2
R/M/ H	VAC	REMEDIAL/MINOR/HONOURS COURSE	3-1-0	4*	4
TOTAL				25/29	23/27

PROGRAM ELECTIVE I

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
D	MET312	NONDESTRUCTIVE TESTING	2-1-0	3	3
	MET322	DATA ANALYTICS FOR ENGINEERS	2-1-0		
	MET332	ADVANCED MECHANICS OF SOLIDS	2-1-0		
	MET342	IC ENGINE COMBUSTION AND POLLUTION	2-1-0		
	MET352	AUTOMOBILE ENGINEERING	2-1-0		
	MET362	PRODUCT DESIGN AND DEVELOPMENT	2-1-0		
	MET372	ADVANCED METAL JOINING TECHNIQUES	2-1-0		

NOTE:

1. Industrial Economics & Foreign Trade and Management for Engineers shall be offered in both S5 and S6. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Industrial Economics & Foreign Trade in S5 and Management for Engineers in S6 and vice versa.

2. **All Institutions should keep 4 hours exclusively for Remedial class/Minor/Honours course (Tuesdays from 2 to 4 PM and Wednesdays from 2 to 4 PM). If a student does not opt for minor/honors programme, he/she can be given remedial class.
3. Comprehensive Course Work: The comprehensive course work in the sixth semester of study shall have a written test of 50 marks. The written examination will be of objective type similar to the GATE examination and will be conducted online by the University. **Syllabus for comprehensive examination shall be prepared by the respective BoS choosing any 5 core courses studied from semester 3 to 5.** The pass minimum for this course is 25. The course should be mapped with a faculty and classes shall be arranged for practising questions based on the core courses listed in the curriculum.



SEMESTER VII

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	MET401	DESIGN OF MACHINE ELEMENTS	2-1-0	3	3
B	METXXX	PROGRAM ELECTIVE II	2-1-0	3	3
C	METXXX	OPEN ELECTIVE	2-1-0	3	3
D	MCN401	INDUSTRIAL SAFETY ENGINEERING	2-1-0	3	---
S	MEL411	MECHANICAL ENGINEERING LAB	0-0-3	3	2
T	MEQ413	SEMINAR	0-0-3	3	2
U	MED415	PROJECT PHASE I	0-0-6	6	2
R/M/ H	VAC	REMEDIAL/MINOR/HONORS COURSE	3-1-0	4*	4
TOTAL				24/28	15/19

PROGRAM ELECTIVE II

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
B	MET413	ADVANCED METHODS IN NONDESTRUCTIVE TESTING	2-1-0	3	3
	MET423	OPTIMIZATION TECHNIQUES AND APPLICATIONS	2-1-0		
	MET433	FINITE ELEMENT METHOD	2-1-0		
	MET443	AEROSPACE ENGINEERING	2-1-0		
	MET453	HYBRID AND ELECTRIC VEHICLES	2-1-0		
	MET463	OPERATIONS MANAGEMENT	2-1-0		
	MET473	AIR CONDITIONING AND REFRIGERATION	2-1-0		

OPEN ELECTIVE

The open elective is offered in semester 7. Each program should specify the courses (maximum 5) they would like to offer as electives for other programs. The courses listed below are offered by the **Department of MECHANICAL ENGINEERING for students of other undergraduate branches offered in the college under KTU.**

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
C	MET415	INTRODUCTION TO BUSINESS ANALYTICS	2-1-0	3	3
	MET425	QUANTITATIVE TECHNIQUES FOR ENGINEERS	2-1-0		
	MET435	AUTOMOTIVE TECHNOLOGY	2-1-0		
	MET445	RENEWABLE ENERGY ENGINEERING	2-1-0		
	MET455	QUALITY ENGINEERING AND MANAGEMENT	2-1-0		

NOTE:

1. *All Institutions should keep 4 hours exclusively for Remedial class/Minor/Honors course (Mondays from 10 to 12 and Wednesdays from 10 to 12 Noon). If a student does not opt for minor/honours programme, he/she can be given remedial class.
2. Seminar: To encourage and motivate the students to read and collect recent and reliable information from their area of interest confined to the relevant discipline from technical publications including peer reviewed journals, conference, books, project reports etc., prepare a report based on a central theme and present it before a peer audience. Each student shall present the seminar for about 20 minutes duration on the selected topic. The report and the presentation shall be evaluated by a team of internal members comprising three senior faculty members based on style of presentation, technical content, adequacy of references, depth of knowledge and overall quality of the report.

Total marks: 100, only CIE, minimum required to pass 50

Attendance : 10

Guide : 20

Technical Content of the Report : 30

Presentation : 40

3. Project Phase I: A Project topic must be selected either from research literature or the students themselves may propose suitable topics in consultation with their guides. The object of Project Work I is to enable the student to take up investigative study in the broad field of Mechanical Engineering, either fully theoretical/practical or involving both theoretical and practical work to be assigned by the Department on a group of three/four students, under the guidance of a Supervisor. This is expected to provide a good initiation for the student(s) in R&D work. The assignment to normally include:
 - Survey and study of published literature on the assigned topic;
 - Preparing an Action Plan for conducting the investigation, including team work;
 - Working out a preliminary Approach to the Problem relating to the assigned topic;
 - Block level design documentation
 - Conducting preliminary Analysis/ Modelling/ Simulation/ Experiment/ Design/

Feasibility;

- Preparing a Written Report on the Study conducted for presentation to the Department;
- Final Seminar, as oral Presentation before the evaluation committee.

Total marks: 100, only CIE, minimum required to pass 50

Guide : 30

Interim evaluation by the evaluation committee : 20

Final Seminar : 30

The report evaluated by the evaluation committee : 20

The evaluation committee comprises HoD or a senior faculty member, Project coordinator and project supervisor.



SEMESTER VIII

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	MET402	MECHATRONICS	2-1-0	3	3
B	METXXX	PROGRAM ELECTIVE III	2-1-0	3	3
C	METXXX	PROGRAM ELECTIVE IV	2-1-0	3	3
D	METXXX	PROGRAM ELECTIVE V	2-1-0	3	3
E	MET404	COMPREHENSIVE VIVA VOCE	1-0-0	1	1
U	MED416	PROJECT PHASE II	0-0-12	12	4
R/M/ H	VAC	REMEDIAL/MINOR/HONORS COURSE	3-1-0	4*	4
TOTAL				25/28	17/21

PROGRAM ELECTIVE III

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
B	MET414	QUALITY MANAGEMENT	2-1-0	3	3
	MET424	DECISIONS WITH METAHEURISTICS	2-1-0		
	MET434	PRESSURE VESSEL AND PIPING DESIGN	2-1-0		
	MET444	COMPUTATIONAL FLUID DYNAMICS	2-1-0		
	MET454	INDUSTRIAL TRIBOLOGY	2-1-0		
	MET464	MICRO AND NANO MANUFACTURING	2-1-0		
	MET474	HEATING AND VENTILATION SYSTEMS	2-1-0		

PROGRAM ELECTIVE IV

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
C	MET 416	COMPOSITE MATERIALS	2-1-0	3	3
	MET 426	ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING	2-1-0		
	MET 436	ACOUSTICS AND NOISE CONTROL	2-1-0		
	MET 446	HEAT TRANSFER EQUIPMENT DESIGN	2-1-0		
	MET 456	ROBOTICS AND AUTOMATION	2-1-0		
	MET 466	TECHNOLOGY MANAGEMENT	2-1-0		
	MET 476	CRYOGENIC ENGINEERING	2-1-0		

PROGRAM ELECTIVE V

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
D	MET 418	RELIABILITY ENGINEERING	2-1-0	3	3
	MET 428	INDUSTRIAL INTERNET OF THINGS	2-1-0		
	MET438	FRACTURE MECHANICS	2-1-0		
	MET 448	GAS TURBINES AND JET PROPULSION	2-1-0		
	MET 458	ADVANCED ENERGY ENGINEERING	2-1-0		
	MET 468	ADDITIVE MANUFACTURING	2-1-0		
	MET 478	POWER PLANT ENGINEERING	2-1-0		

NOTE

1. *All Institutions should keep 4 hours exclusively for Remedial class/Minor/Honours course (Mondays from 10 to 12 and Wednesdays from 10 to 12). If a student does not opt for minor/honors programme, he/she can be given remedial class.
2. **Comprehensive Course Viva:** The comprehensive course viva in the eighth semester of study shall have a viva voce for 50 marks. The viva voce shall be conducted based on the syllabus mentioned for comprehensive course work in the sixth semester. The viva voce will be conducted by the same three member committee assigned for final project phase II evaluation towards the end of the semester. The pass minimum for this course is 25. The course should be mapped with a faculty and classes shall be arranged for practising questions based on the core courses listed in the curriculum. The mark will be treated as internal and should be uploaded along with internal marks of other courses.
3. **Project Phase II:** The object of Project Work II & Dissertation is to enable the student to extend further the investigative study taken up in Project 1, either fully theoretical/practical or involving both theoretical and practical work, under the guidance of a Supervisor from the Department alone or jointly with a Supervisor drawn from R&D laboratory/Industry. This is expected to provide a good training for the student(s) in R&D work and technical leadership. The assignment to normally include:
 - In depth study of the topic assigned in the light of the Report prepared under Phasel;
 - Review and finalization of the Approach to the Problem relating to the assigned topic;
 - Detailed Analysis/ Modelling/ Simulation/ Design/ Problem Solving/ Experiment as needed;
 - Final development of product/process, testing, results, conclusions and future directions;
 - Preparing a paper for Conference presentation/Publication in Journals, if possible;

- Preparing a Dissertation in the standard format for being evaluated by the Department;
- Final Presentation before a Committee

Total marks: 150, only CIE, minimum required to pass 75

Guide : 30

Interim evaluation, 2 times in the semester by the evaluation committee : 50

Quality of the report evaluated by the above committee : 30

Final evaluation by a three member committee : 40

(The final evaluation committee comprises Project coordinator, expert from Industry/research Institute and a senior faculty from a sister department. The same committee will conduct comprehensive course viva for 50 marks).

MINOR

Minor is an additional credential a student may earn if s/he does 20 credits worth of additional learning in a discipline other than her/his major discipline of B.Tech. degree. The objective is to permit a student to customize their Engineering degree to suit their specific interests. Upon completion of an Engineering Minor, a student will be better equipped to perform interdisciplinary research and will be better employable. Engineering Minors allow a student to gain interdisciplinary experience and exposure to concepts and perspectives that may not be a part of their major degree programs.

The academic units offering minors in their discipline will prescribe the set of courses and/or other activities like projects necessary for earning a minor in that discipline. A specialist basket of 3-6 courses is identified for each Minor. Each basket may rest on one or more foundation courses. A basket may have sequences within it, i.e., advanced courses may rest on basic courses in the basket. S/he accumulates credits by registering for the required courses, and if the requirements for a particular minor are met within the time limit for the course, the minor will be awarded. This will be mentioned in the Degree Certificate as “Bachelor of Technology in xxx with Minor in yyy”. The fact will also be reflected in the consolidated grade card, along with the list of courses taken. If one specified course cannot be earned during the course of the programme, that minor will not be awarded. The individual course credits earned, however, will be reflected in the consolidated grade card.

(i) The curriculum/syllabus committee/BoS shall prepare syllabus for courses to be included in the curriculum from third to eight semesters for all branches. The minor courses shall be identified by

M slot courses.

(ii) Registration is permitted for Minor at the beginning of third semester. Total credits required is 182 (162 + 20 credits from value added courses)

(iii) Out of the 20 Credits, 12 credits shall be earned by undergoing a minimum of three courses listed in the curriculum for minor, of which one course shall be a mini project based on the chosen area. They can do miniproject either in S7 or in S8. The remaining 8 credits could be acquired by undergoing 2 MOOCs recommended by the Board of studies and approved by the Academic Council or through courses listed in the curriculum. The classes for Minor shall be conducted along with regular classes and no extra time shall be required for conducting the courses.

(iv) There won't be any supplementary examination for the courses chosen for Minor.

(v) On completion of the program, "Bachelor of Technology in xxx with Minor in yyy" will be awarded.

(vi) The registration for minor program will commence from semester 3 and the all academic units offering minors in their discipline should prescribe set of such courses. The courses shall be grouped into maximum of 3 baskets. The basket of courses may have sequences within it, i.e., advanced courses may rest on basic courses in the basket. Reshuffling of courses between various baskets will not be allowed. In any case, they should carry out a mini project based on the chosen area in S7 or S8. Students who have registered for **B.Tech Minor in MECHANICAL ENGINEERING Branch** can opt to study the courses listed below:

S e m e s t e r	BASKET I				BASKET II				BASKET III			
	Course No.	Course Name	H O U R S	C R E D I T	Course No.	Course Name	H O U R S	C R E D I T	Course No.	Course Name	H O U R S	C R E D I T
S3	MET281	MECHANICS OF MATERIALS	4	4	MET283	FLUID MECHANICS & MACHINERY	4	4	MET285	MATERIAL SCIENCE & TECHNOLOGY	4	4
S4	MET282	THEORY OF MACHINES	4	4	MET284	THERMODYNAMICS	4	4	MET286	MANUFACTURING TECHNOLOGY	4	4
S5	MET381	DYNAMICS OF MACHINES	4	4	MET383	THERMAL ENGINEERING	4	4	MET385	MACHINE TOOLS ENGINEERING	4	4
S6	MET382	MACHINE DESIGN	4	4	MET384	HEAT TRANSFER	4	4	MET386	INDUSTRIAL ENGINEERING	4	4
S7	MED481	MINIPROJECT	4	4	MED481	MINIPROJECT	4	4	MED481	MINIPROJECT	4	4
S8	MED482	MINIPROJECT	4	4	MED482	MINIPROJECT	4	4	MED482	MINIPROJECT	4	4

HONOURS

Honours is an additional credential a student may earn if s/he opts for the extra 20 credits needed for this in her/his own discipline. Honours is not indicative of class. KTU is providing this option for academically extra brilliant students to acquire Honours. Honours is intended for a student to gain expertise/specialise in an area inside his/her major B.Tech discipline and to enrich knowledge in emerging/advanced areas in the branch of engineering concerned. It is particularly suited for students aiming to pursue higher studies. Upon completion of Honours, a student will be better equipped to perform research in her/his branch of engineering. On successful accumulation of credits at the end of the programme, this will be mentioned in the Degree Certificate as "Bachelor of Technology in xxx, with Honours." The fact will also be reflected in the consolidated grade card, along with the list of courses taken. If one specified course cannot be earned during the course of the programme, Honours will not be awarded. The individual course credits earned, however, will be reflected in the consolidated grade card.

The courses shall be grouped into maximum of 3 groups, each group representing a particular specialization in the branch. The students shall select only the courses from same group in all

semesters. It means that the specialization is to be fixed by the student and cannot be changed subsequently. The internal evaluation, examination and grading shall be exactly as for other mandatory courses. The Honours courses shall be identified by H slot courses.

- (i) The curriculum/syllabus committee/BOS shall prepare syllabus for courses to be included in the curriculum from fourth to eight semesters for all branches. The honours courses shall be identified by H slot courses.
- (ii) Registration is permitted for Honours at the beginning of fourth semester. Total credits required is 182 (162 + 20 credits from value added courses).
- (iii) Out of the 20 Credits, 12 credits shall be earned by undergoing a minimum of three courses listed in the curriculum for honours, of which one course shall be a mini project based on the chosen area. The remaining 8 credits could be acquired by undergoing 2 MOOCs recommended by the Board of studies and approved by the Academic Council or through courses listed in the curriculum. The classes for Honours shall be conducted along with regular classes and no extra time shall be required for conducting the courses. The students should earn a grade of 'C' or better for all courses under honours.
- (iv) There won't be any supplementary examination for the courses chosen for honours.
- (v) On successful accumulation of credits at the end of the programme, "Bachelor of Technology in xxx, with Honours" will be awarded if overall CGPA is greater than or equal to 8.5, earned a grade of 'C' or better for all courses chosen for honours and without any history of 'F' Grade.
- (vi) The registration for honours program will commence from semester 4 and the all academic units offering honours in their discipline should prescribe set of such courses. The courses shall be grouped into maximum of 3 groups, each group representing a particular specialization in the branch. The students shall select only the courses from same group in all semesters. It means that the specialization is to be fixed by the student and cannot be changed subsequently. In any case, they should carry out a mini project based on the chosen area in S8. Students who have registered for **B.Tech Honours in MECHANICAL ENGINEERING** can opt to study the courses listed below.

SE ME STE R	GROUP I				GROUP II				GROUP III			
	Course No.	Course Name	H O U R S	C R E D I T	Course No.	Course Name	H O U R S	C R E D I T	Course No.	Course Name	H O U R S	C R E D I T
S4	MET292	CONTINUUM MECHANICS	4	4	MET294	ADVANCED MECHANICS OF FLUIDS	4	4	MET296	MATERIALS IN MANUFACTURING	4	4
S5	MET393	EXPERIMENTAL STRESS	4	4	MET395	ADVANCED THERMODYNA	4	4	MET397	FLUID POWER	4	4

		ANALYSIS				MICS				AUTOMATION		
S6	MET394	ADVANCED DESIGN SYNTHESIS	4	4	MET396	COMPRESSIBLE FLUID FLOW	4	4	MET398	ADVANCED NUMERICAL CONTROLLED MACHINING	4	4
S7	MET495	ADVANCED THEORY OF VIBRATIONS	4	4	MET497	COMPUTATIONAL METHODS IN FLUID FLOW & HEAT TRANSFER	4	4	MET499	PRECISION MACHINING	4	4
S8	MED496	MINIPROJECT	4	4	MED496	MINIPROJECT	4	4	MED496	MINIPROJECT	4	4

INDUCTION PROGRAM

There will be three weeks induction program for first semester students. It is a unique three-week immersion Foundation Programme designed especially for the fresher's which includes a wide range of activities right from workshops, lectures and seminars to sports tournaments, social work and much more. The programme is designed to mould students into well-rounded individuals, aware and sensitized to local and global conditions and foster their creativity, inculcate values and ethics, and help students to discover their passion. Foundation Programme also serves as a platform for the fresher's to interact with their batchmates and seniors and start working as a team with them. The program is structured around the following five themes:

The programme is designed keeping in mind the following objectives:

- **Values and Ethics:** Focus on fostering a strong sense of ethical judgment and moral fortitude.
- **Creativity:** Provide channels to exhibit and develop individual creativity by expressing themselves through art, craft, music, singing, media, dramatics, and other creative activities.
- **Leadership, Communication and Teamwork:** Develop a culture of teamwork and group communication.
- **Social Awareness:** Nurture a deeper understanding of the local and global world and our place in it as concerned citizens of the world.

MAHATMA GANDHI UNIVERSITY



SCHEME AND SYLLABI
FOR
M.TECH DEGREE PROGRAMME
IN
MECHANICAL ENGINEERING
WITH SPECIALIZATION IN
INDUSTRIAL ENGINEERING AND MANAGEMENT
(2013 ADMISSION ONWARDS)

SEMESTER III

Sl. No.	Course No.	Subject	Hrs / Week			Evaluation Scheme (Marks)					Credits (C)
			L	T	P	Sessional			ESE	Total	
						TA	CT	Sub Total			
1	MCPRM 301	Research Methodology	4	0	0	25	25	50	100	150	4
2	MMEIM 302	Knowledge Management	4	0	0	25	25	50	100	150	4
3	MMEIM 303	Mini Project or Industrial Training	0	0	16	25	25	50	100	150	7
		Master's Thesis Phase - I	0	0	3	25	0	25	25	50	
Total			8	0	19	100	75	175	325	500	15

SEMESTER IV

Sl. No	Course No.	Subject	Hrs / Week			Evaluation Scheme (Marks)					Credits (C)
			L	T	P	Sessional			ESE	Total	
						TA	CT	Sub Total			
1	MMEIM 401	Master's Thesis	0	0	27	100	0	100	100	200	12
2	MMEIM 402	Master's Comprehensive Viva	0	0	0	0	0	0	100	100	3
Total										300	15
Grand Total of four Semesters									3000	80	

KERALA TECHNOLOGICAL UNIVERSITY



SCHEME AND SYLLABUS

FOR

M. Tech. DEGREE PROGRAMME

IN

MECHANICAL ENGINEERING

WITH SPECIALIZATION

INDUSTRIAL ENGINEERING AND MANAGEMENT

CLUSTER 05 (ERNAKULAM II)

KERALA TECHNOLOGICAL UNIVERSITY

CET Campus, Thiruvananthapuram

Kerala, India -695016

(2015 ADMISSION ONWARDS)

KERALA TECHNOLOGICAL UNIVERSITY

SCHEME AND SYLLABUS FOR M. Tech. DEGREE PROGRAMME

Branch: MECHANICAL ENGINEERING

Specialization: INDUSTRIAL ENGINEERING AND MANAGEMENT

Semester 1 (Credits: 21)

Exam Slot	Course No:	Name	L- T - P	Internal Marks	End Semester Exam		Credits
					Marks	Duration (hrs)	
A	05ME 6401	Integrated Materials Management	3-1-0	40	60	3	4
B	05ME 6403	Manufacturing System Management	3-1-0	40	60	3	4
C	05ME 6405	Organizational Behaviour	3-1-0	40	60	3	4
D	05ME 6407	Quality Engineering and Management	3-0-0	40	60	3	3
E	05ME 641x	Elective-I	3-0-0	40	60	3	3
	05ME 6477	Research Methodology	0-2-0	100	0	0	2
	05ME6491	Software Lab	0-0-2	100	0	0	1

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Elective 05ME 6411	Business Mathematics
05ME 6413	Marketing and Consumer Behaviour
05ME 6415	Industrial Relations

Semester 2 (Credits: 21)

Exam Slot	Course No:	Name	L- T - P	Internal Marks	End Semester Exam		Credits
					Marks	Duration (hrs)	
A	05ME 6402	Advanced Operations Research	3-1-0	40	60	3	4
B	05ME 6404	Work System Design	3-0-0	40	60	3	3
C	05ME 6406	Supply Chain Management	3-0-0	40	60	3	3
D	05ME 642x	Elective-II	3-0-0	40	60	3	3
E	05ME 643x	Elective-III	3-0-0	40	60	3	3
	05ME 6466	Seminar I		100	0	0	2
	05ME 6488	Mini Project	0-0-4	100	0	0	2

	05ME 6492	Lab	0-0-2	100	0	0	1
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Elective II

05ME 6422	Human Resource Management
05ME 6424	Marketing Logistics
05ME 6426	Safety and Environment Management System

Elective III

05ME 6432	Business Practise and Industrial Economics
05ME 6434	Reliability Engineering And Management
05ME 6436	Management Information System

Semester 3 (Credits: 14)

Exam Slot	Course No:	Name	L- T - P	Internal Marks	End Semester Exam		Credits
					Marks	Duration (hrs)	
A	05ME 744x	Elective-IV	3-0-0	40	60	3	3
B	05ME 745x	Elective-V	3-0-0	40	60	3	3
	05ME 7467	Seminar II	0-0-2	100	0	-	2
	05ME 7487	Project (Phase I)	0-0-12	50	0	-	6

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Elective IV

05ME 7441	Practical Project Management
05ME 7443	System Modeling and Simulation
05ME 7445	Plant Engineering and Maintenance

Elective V

05ME 7451	Modern Manufacturing System Design
05ME 7453	Knowledge Management
05ME 7455	Industrial Scheduling

Semester 4 (Credits: 12)

Exam Slot	Course No:	Name	L- T - P	Internal Marks	End Semester Exam		Exam Slot
					Marks	Duration (hrs)	
	05ME 7488	Project (Phase 2)	0-0-21	70	30	-	12

12

Total: 68

MAHATMA GANDHI UNIVERSITY KOTTAYAM

REGULATION

1. COURSE OBJECTIVES

The MG University MBA program is designed with the following objectives:

1. To develop young men and women into professional managers to manage all sectors of the organized economic activity.
2. To equip the youngsters with conceptual and interpersonal skills and social purpose for managerial decision-making and its execution in real situations.
3. To develop and encourage the entrepreneurial capabilities of young generation to make them effective change agents.
4. To meet the demand for trained and professional people in the country at the top level management of business and industrial organizations in the light of the new economic and industrial policy of the country.

2. COURSE DURATION

The MBA (Full Time) programme of Mahatma Gandhi University shall be spread in two years duration with 4 Semesters. Each semester shall comprise of a minimum of 16 instructional weeks of 5 days each of 5 hours a day (total contact hours 400). Continuous Internal Evaluation during the course period and University examination at the end of each semester shall be conducted. There shall be a semester break of 15 days each in addition to the usual Onam, Christmas and summer holidays.

3. ELIGIBILITY FOR ADMISSION

1. A pass in any Bachelor's Degree Examination of Mahatma Gandhi University or an equivalent degree of any other universities duly recognized by M.G.University with not less than 50% marks in the aggregate for all parts of examination or a Master's Degree examination with 50% marks in aggregate.
2. SC/ST students
A pass in any Bachelor's Degree examination is needed for SC/ST candidates

4. ADMISSION PROCEDURE

Admission to MBA Degree programme of the study shall be on the basis of merit as determined by MAT/CAT/XAT /MGU-MAT and Group discussion & interview conducted by Mahatma Gandhi University. A five member committee will be constituted

by Hon. Vice Chancellor for conducting the admission procedure for MBA Programme including MGU – MAT, Dean Faculty of management will be the Chairman of the Committee and Director, School of Management and Business Studies shall be the member secretary. Among the five members, two members will be from the affiliated colleges of MG University where MBA programme is going on, one member will be a university professor in management school outside Mahatma Gandhi University. MGU-MAT will be conducted by School of Management and Business Studies, monitored by the above mentioned committee.

A rank-list shall be prepared on the basis of the sum of the following three components.

- a) Test Score 80%
- b) Group Discussion 10%
- c) Interview 10%

Candidates will be called for the interview on 1:3 basis.

Based on the score in the test candidate shall be short-listed for Group Discussion and Personal Interview. While preparing the rank list, if there is same index marks for more than one candidate, he/she will be ranked on the basis of actual marks obtained in the qualifying exam. Even after this, there is a tie; they will be ranked on the basis of date of birth that is the elder person is to be ranked higher. Based on the performance on the written test, Group Discussion and interview, merit list will be prepared and published by the committee.

Out of the total sanctioned seats, 50% shall be merit quota (govt. quota) and 50% shall be management quota. Merit quota shall be filled strictly in accordance of the institutional preference opted by the student. Allotment will be done by the admission committee.

Options will be collected by the University from the candidates during counseling and will make allotment of candidate to different institutes on the basis of merit. Reservations applicable as per govt. rule. Based on this, allotment letter will be given by the university to the candidates and the college shall give admission to the candidates in the merit quota (govt. quota).

If sufficient candidates are not joining in the merit quota seats, the college shall report the matter to the university and with the written permission of the university the college management may fill the seats from the merit list.

5. FEE STRUCTURE

For affiliated aided institutions govt. fee structure is applicable to both merit and management seats. For unaided affiliated institutions the fee structure will be decided by fee fixation committee nominated by govt. of Kerala from time to time.

Any form of capitation is strictly prohibited.

6. LIST OF COURSES OF MBA PROGRAMME

FIRST SEMESTER

Course No	Title	Internal Evaluation Marks	External Evaluation Marks	Total Marks
CC01	Principles of Management	40	60	100
CC02	Managerial Communication	40	60	100
CC03	Managerial Economics	40	60	100
CC04	Accounting for Management	40	60	100
CC05	Quantitative Methods for Management	40	60	100
CC06	Legal Environment of Business	40	60	100
CC07	Computer Application in Business	40	60	100
CC08	Organisational Behavior	40	60	100
	Total	320	480	800

SECOND SEMESTER

Course No	Title	Internal Evaluation Marks	External Evaluation Marks	Total Marks
CC09	Financial Management	40	60	100
CC10	Marketing Management	40	60	100
CC11	Human Resource Management	40	60	100
CC12	Operations Management	40	60	100
CC13	Environment Management	40	60	100
CC14	Operations Research	40	60	100
CC15	Research Methodology	40	60	100
CC16	Management Information Systems	40	60	100
CC17	Viva-Voce		100	100
	Total	320	580	900

THIRD SEMESTER

Course No	Title	Internal Evaluation Marks	External Evaluation Marks	Total Marks
CC18	International Business	40	60	100
CC19	Business Ethics & Corporate Governance	40	60	100
EC 1	ELECTIVE 1 (Major Specialization)	40	60	100
EC 2	ELECTIVE 2 (Major Specialization)	40	60	100
EC 3	ELECTIVE 3 (Major Specialization)	40	60	100
EC 4	ELECTIVE 4 (Major Specialization)	40	60	100
EC 5	ELECTIVE 5 (Minor Specialization)	40	60	100
EC 6	ELECTIVE 6 (Minor Specialization)	40	60	100
CC 20	Organization Study	40	60	100
	Total	360	540	900

FOURTH SEMESTER

Course No	Title	Internal Evaluation Marks	External Evaluation Marks	Total Marks
CC21	Strategic Management	40	60	100
EC 1	ELECTIVE 7 (Major Specialization)	40	60	100
EC 2	ELECTIVE 8 (Major Specialization)	40	60	100
EC 3	ELECTIVE 9 (Minor Specialization)	40	60	100
CC22	Project & Comprehensive Viva Voce	-	200	200
	Total	160	440	600

TOTAL MARKS	3200
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7. LIST OF ELECTIVES

1. Marketing Management
2. Financial Management
3. Human Resource Management
4. Information Systems
5. Production and Operations Management
6. International Business

8. COURSE CALENDER

Date of announcement of the course will be done by the university. In order to streamline the MBA programme, colleges are permitted to make their individual announcement of the course only after the course announcement of the university. The course calendar published by the university should be strictly followed for ensuring timely conduct of the course, examinations and publication of results. The course calendar should be prepared by convening a meeting of Principals / Directors of all affiliated management colleges / institutes. This meeting should be convened before the announcement of MBA programme, each year. Semester classes should be started and completed on the stipulated dates at all affiliated colleges / institutes as notified by the university.

With in a week after the commencement of classes of the first semester MBA, Head of each institution should forward the list of faculty members working in the college / institutes along with their qualifications and years of teaching experience, specialization and other relevant details to the university in a format given by the University. Affiliated aided colleges are exempted from this provision. Head of each

MASTER OF BUSINESS ADMINISTRATION

**Programme
Under**

APJ ABDUL KALAM
TECHNOLOGICAL
UNIVERSITY



APJ Abdul Kalam Technological University

SYLLABUS & COURSE PLAN

**Estd.
Trimester 1**

2014

April 2016

TRIMESTER I

Exam Slot	Course No.	Course Name	L-T-P	Internal Marks	End Trimester Marks	Exam Duration (hours)	Credits
	11	Quantitative Techniques	3-0-0	40	60	3	3
	12	Organizational Behaviour I	3-0-0	40	60	3	3
	13	Managerial Economics	3-0-0	40	60	3	3
	14	Business Communication	3-0-0	40	60	3	3
	15	Accounting for Managers	3-0-0	40	60	3	3
	16	Business and Society	3-0-0	40	60	3	3
	17	Soft Skills I*	0-2-0	20	-	-	-
	18	Project**	0-0-9	-	-	-	-
		TOTAL	18-2-9	260	360		18

* - Soft Skills University Exam will be conducted only in the Third Trimester

** - 9 Hours of Project is distributed among all courses for Seminars/Presentations



MASTER OF BUSINESS ADMINISTRATION

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APJ ABDUL KALAM
TECHNOLOGICAL
UNIVERSITY

APJ Abdul Kalam Technological University

SYLLABUS & COURSE PLAN

Trimester 2

Estd.



2014

April 2016

Trimester 2

Course No.	Course Name	L-T-P	Internal Marks	End Trimester Marks	Exam duration (Hrs.)	Credits
21	Organizational Behaviour II	3-0-0	40	60	3	3
22	Macroeconomics	3-0-0	40	60	3	3
23	Marketing Management I	3-0-0	40	60	3	3
24	Operations Management	3-0-0	40	60	3	3
25	Financial Management I	3-0-0	40	60	3	3
26	Business Law	3-0-0	40	60	3	3
27	Soft Skills II*	0-2-0	20	-	-	-
28	Project**	0-0-9	-	-	-	-
Total		18-2-9	260	360	-	18

- Soft Skills University Exam will be conducted only in the Third Trimester

* *

- 9 Hours of Project is distributed among all courses for Seminars/Presentations



MASTER OF BUSINESS ADMINISTRATION

**Programme
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APJ Abdul Kalam Technological University

SYLLABUS & COURSE PLAN

Trimester 3



April 2016

Subjects and Credits in Trimester 3

Course No.	Course Name	L-T-P	Internal Marks	End Trimester Marks	Exam duration (Hrs.)	Credits
31	Marketing Management II	3-0-0	40	60	3	3
32	Financial Management II	3-0-0	40	60	3	3
33	Human Resource Management	3-0-0	40	60	3	3
34	Business Research Methods	1.5-0-0	20	30	1.5	1.5
35	Management Information Systems	1.5-0-0	20	30	1.5	1.5
36	Operations Research	3-0-0	40	60	3	3
37	Strategic Management	3-0-0	40	60	3	3
38	Soft Skills III*	0-3-0	-	60	-	3
Total		18-3-0	240	420	-	21

* - Soft Skills Exam will be conducted only in the Third Trimester with internals carried over from earlier First and Second Trimesters



MASTER OF BUSINESS ADMINISTRATION

**Programme
Under**

APJ Abdul Kalam Technological University

SYLLABUS & COURSE PLAN

Trimester 4



TRIMESTER IV

Exam Slot	Course No.	Course Name	L-T-P	Internal Marks	End Trimester Marks	Exam Duration (hours)	Credits
	41	International Business	3-0-0	40	60	3	3
	42	Business Analytics	3-0-0	40	60	3	3
	43	Elective I	3-0-0	40	60	3	3
	44	Elective II	3-0-0	40	60	3	3
	45	Elective III	3-0-0	40	60	3	3
	46	Elective IV	3-0-0	40	60	3	3
		TOTAL	18-0-0	240	360		18



MASTER OF BUSINESS ADMINISTRATION

**Programme
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APJ Abdul Kalam Technological University

SYLLABUS & COURSE PLAN

**Estd.
Trimester 5**

June 2016

TRIMESTER V

Exam Slot	Course No.	Course Name	L-T-P	Internal Marks	End Trimester Marks	Exam Duration (hours)	Credits
	51	Entrepreneurship	3-0-0	40	60	3	3
	52	Business Ethics and Corporate Governance	3-0-0	40	60	3	3
	53	Elective V	3-0-0	40	60	3	3
	54	Elective VI	3-0-0	40	60	3	3
	55	Elective VII	3-0-0	40	60	3	3
	56	Elective VIII	3-0-0	40	60	3	3
	57	Project	0-0-4	100	-		4
		TOTAL	18-0-4	340	360		22



MASTER OF BUSINESS ADMINISTRATION

**Programme
Under**



APJ Abdul Kalam Technological University

SYLLABUS & COURSE PLAN

Trimester 6

June 2016

TRIMESTER VI

Exam Slot	Course No.	Course Name	L-T-P	Internal Marks	End Trimester Marks	Exam Duration (hours)	Credits
	61	Cross Cultural Management	3-0-0	40	60	3	3
	62	Elective IX	3-0-0	40	60	3	3
	63	Elective X	3-0-0	40	60	3	3
	64	Comprehensive Project*	0-0-6	100	100		6
	65	Internship	0-0-3	60			3
		TOTAL	9-0-9	280	280		18

*- Report Evaluation and Viva Voce with External Examiners to be carried out as per Regulation

Course code	Course Name	Credits	Year of Introduction						
**492	PROJECT	6	2016						
Prerequisite : Nil									
Course Objectives <ul style="list-style-type: none">To apply engineering knowledge in practical problem solvingTo foster innovation in design of products, processes or systemsTo develop creative thinking in finding viable solutions to engineering problems									
Course Plan <p>In depth study of the topic assigned in the light of the preliminary report prepared in the seventh semester</p> <p>Review and finalization of the approach to the problem relating to the assigned topic</p> <p>Preparing a detailed action plan for conducting the investigation, including team work</p> <p>Detailed Analysis/Modelling/Simulation/Design/Problem Solving/Experiment as needed</p> <p>Final development of product/process, testing, results, conclusions and future directions</p> <p>Preparing a paper for Conference presentation/Publication in Journals, if possible</p> <p>Preparing a report in the standard format for being evaluated by the dept. assessment board</p> <p>Final project presentation and viva voce by the assessment board including external expert</p>									
Expected outcome <p>The students will be able to</p> <ul style="list-style-type: none">iii. Think innovatively on the development of components, products, processes or technologies in the engineering fieldiv. Apply knowledge gained in solving real life engineering problems									
Evaluation <p>Maximum Marks : 100</p> <table><tr><td>(i) Two progress assessments</td><td>20% by the faculty supervisor(s)</td></tr><tr><td>(ii) Final project report</td><td>30% by the assessment board</td></tr><tr><td>(iii) Project presentation and viva voce</td><td>50% by the assessment board</td></tr></table> <p><i>Note:</i> All the three evaluations are mandatory for course completion and for awarding the final grade.</p>				(i) Two progress assessments	20% by the faculty supervisor(s)	(ii) Final project report	30% by the assessment board	(iii) Project presentation and viva voce	50% by the assessment board
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