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MANGALAM
COLLEGE OF ENGINEERING
Inspire | Imbibe | Innovate

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(Approved by AICTE, Affiliated to MGU / APJ Abdul Kalam Technological University, NAAC Accredited & ISO Certified Institution)

Letter Of Authorization

This Letter is to authorize that the below mentioned Courses are claimed for undertaking Project Work/Field Work/internships as per the affiliating university curriculum.

PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor
Principal

Program name	Program code	Name of the Course that include experiential learning through project work/field work/internship	Course code
B TECH	CE	CIVIL ENGINEERING DRAFTING LAB	CE 231
B TECH	CE	ADVANCED CONCRETE TECHNOLOGY	CE 361
B TECH	CE	CIVIL ENGINEERING DRAFTING LAB	CE 231
B TECH	CE	CIVIL ENGINEERING PROJECT MANAGEMENT	CE 404
B TECH	CE	COMPUTER AIDED CIVIL ENGINEERING LAB	CE 334
B TECH	CE	COMPUTER PROGRAMMING AND COMPUTATIONAL TECHNIQUES	CE 306
B TECH	CE	CONSTRUCTION TECHNOLOGY	CE 204
B TECH	CE	DESIGN OF CONCRETE STRUCTURES	CE 301
B TECH	CE	DESIGN OF CONCRETE STRUCTURES I	CE 301
B TECH	CE	DESIGN OF CONCRETE STRUCTURES II	CE 304
B TECH	CE	DESIGN OF HYDRAULIC STRUCTURES	CE 302
B TECH	CE	DESIGN OF STEEL STRUCTURES	CE 401
B TECH	CE	DESIGN PROJECT	CE 341
B TECH	CE	ENGINEERING MECHANICS	BE 100
B TECH	CE	ENVIRONMENT & POLLUTION	CE 371
B TECH	CE	ENVIRONMENTAL ENGINEERING I	CE 402
B TECH	CE	ENVIRONMENTAL ENGINEERING II	CE 402
B TECH	CE	ENVIRONMENTAL ENGINEERING LAB	CE 431
B TECH	CE	ENVIRONMENTAL IMPACT ASSESSMENT	CE 469
B TECH	CE	FLUID MECHANICS LAB	CE 234
B TECH	CE	FLUID MECHANICS I	CE 203
B TECH	CE	FLUID MECHANICS II	CE 206
B TECH	CE	GEO ENVIRONMENTAL ENGINEERING	CE 465
B TECH	CE	GEOMATICS	CE 307
B TECH	CE	GEOTECHNICAL ENGINEERING I	CE 208
B TECH	CE	GEOTECHNICAL ENGINEERING II	CE 305
B TECH	CE	GEOTECHNICAL ENGINEERING LAB	CE 333
B TECH	CE	GROUND IMPROVEMENT TECHNIQUES	CE 362
B TECH	CE	INTRODUCTION TO CIVIL ENGINEERING	BE101-01
B TECH	CE	INTRODUCTION TO SUSTAINABLE ENGINEERING	BE 103
B TECH	CE	INTRODUCTION TO SUSTAINABLE ENGINEERING	BE 103
B TECH	CE	MATERIAL TESTING LAB	CE 232
B TECH	CE	MATERIAL TESTING LAB II	CE 331
B TECH	CE	MECHANICS OF SOLIDS	CE 201
B TECH	CE	MUNICIPAL SOLID WASTE MANAGEMENT	CE 474
B TECH	CE	PROJECT	CE 492
B TECH	CE	QUANTITY SURVEYING AND VALUATION	CE 409
B TECH	CE	SEMINAR & PROJECT PRELIMINARY	CE 451
B TECH	CE	STRUCTURAL ANALYSIS I	CE 202
B TECH	CE	STRUCTURAL ANALYSIS II	CE 303
B TECH	CE	STRUCTURAL ANALYSIS III	CE 403
B TECH	CE	SURVEY LAB	CE 233
B TECH	CE	SURVEYING	CE 207
B TECH	CE	TRAFFIC ENGINEERING AND MANAGEMENT	CE 366


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Program name	Program code	Name of the Course that include experiential learning through project work/field work/internship	Course code
B TECH	CE	TRANSPORTATION ENGINEERING I	CE 308
B TECH	CE	TRANSPORTATION ENGINEERING II	CE 407
B TECH	CE	TRANSPORTATION ENGINEERING LAB	CE 332
B TECH	CE	WATER RESOURCE ENGINEERING	CE 309
B TECH	CSE	THEORY OF COMPUTATION	CS 301
B TECH	CSE	DESIGN AND ANALYSIS OF ALGORITHMS	CS 302
B TECH	CSE	SYSTEM SOFTWARE	CS 303
B TECH	CSE	COMPILER DESIGN	CS 304
B TECH	CSE	COMPUTER NETWORKS	CS 306
B TECH	CSE	DATA COMMUNICATION	CS 307
B TECH	CSE	SOFTWARE ENGINEERING AND PROJECT MANAGMENT	CS 308
B TECH	CSE	GRAPH THEORY AND COMBINATORICS	CS 309
B TECH	CSE	SYSTEM SOFTWARE LAB	CS 331
B TECH	CSE	MICROPROCESSOR LAB	CS 332
B TECH	CSE	APPLICATION SOFTWARE DEVOLPMENT LAB	CS 333
B TECH	CSE	NETWORK PROGRAMMING LAB	CS 334
B TECH	CSE	DESIGN PROJECT	CS 341
B TECH	CSE	SOFT COMPUTING	CS 361
B TECH	CSE	MOBILE COMPUTING	CS 367
B TECH	CSE	WEB TECHNOLOGIES	CS 368
B TECH	CSE	COMPUTER GRAPHICS	CS 401
B TECH	CSE	DATA MINING AND WAREHOUSING	CS 402
B TECH	CSE	PROGRAMMING PARADIGMS	CS 403
B TECH	CSE	EMBEDDED SYSTEM	CS 404
B TECH	CSE	COMPUTER SYSTEM ARCHITECTURE	CS 405
B TECH	CSE	DISTRIBUTED COMPUTING	CS 407
B TECH	CSE	CRYPTOGRAPHY AND NETWORK SECURITY	CS 409
B TECH	CSE	SEMINAR & PROJECT PRELIMINARY	CS 451
B TECH	CSE	ARTIFICIAL INTELLIGENCE	CS 464
B TECH	CSE	BIO INFORMATICS	CS 465
B TECH	CSE	MACHINE LEARNING	CS 467
B TECH	CSE	EMBEDDED SYSTEMS	CS 402
B TECH	CSE	DATA STRUCTURES LAB	CSL 201
B TECH	CSE	DIGITAL LAB	CSL 202
B TECH	CSE	OBJECT ORIENTED PROGRAMMING LAB IN JAVA	CSL 203
B TECH	CSE	DATA STRUCTURES	CST 201
B TECH	CSE	COMPUTER ORGANIZATION AND ARCHITECTURE	CST 202
B TECH	CSE	LOGIC SYSTEM DESIGN	CST 203
B TECH	CSE	OBJECT ORIENTED PROGRAMMING IN JAVA	CST 203
B TECH	CSE	DATABASE MANAGEMENT SYSTEM	CST 204
B TECH	CSE	COMPUTATIONAL FUNDAMENTALS FOR MACHINE LEARNING	CST 294


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Program name	Program code	Name of the Course that include experiential learning through project work/field work/internship	Course code
B TECH	CSE	MICROPROCESSORS AND MICROCONTROLLERS	CST 332
B TECH	CSE	BIOMEDICAL ENGINEERING	EC 482
B TECH	CSE	ANALOG COMMUNICATION	ECT 283
B TECH	CSE	DIIGITAL COMMUNICATION	ECT 284
B TECH	CSE	PROGRAMMING IN C	EST 102
B TECH	CSE	BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING	EST 130
B TECH	CSE	DESIGN & ENGINEERING	EST 200
B TECH	CSE	BASICS OF ROBOTICS	RAT 281
B TECH	CSE	INTRODUCTION TO INDUSTRIAL AUTOMATION	RAT 282
M TECH	CSE	COMPUTATIONAL INTELLIGENCE	04 CS 6101
M TECH	CSE	ADVANCED DATA STRUCTUREE AND ALGORITHMS	04 CS 6103
M TECH	CSE	AUTOMATA THEORY AND COMPUTABILITY	04 CS 6104
M TECH	CSE	COMPUTER SECURITY AND APPLIED CRYPTOGRAPHY	04 CS 6105
M TECH	CSE	MODERN COMPUTER NETWORKS	04 CS 6107
M TECH	CSE	WEB SERVICES	04 CS 6109
M TECH	CSE	WEB SECURITY	04 CS 6114
M TECH	CSE	SOCIAL NETWORK ANALYTICS	04 CS 6115
M TECH	CSE	BIOINFORMATICS	04 CS 6118
M TECH	CSE	OPERATING SYSTEM DESIGN CONCEPTS	04 CS 6124
M TECH	CSE	MINI PROJECT	04 CS 6192
M TECH	CSE	NETWORK SIMULATION LAB	04 CS 6193
M TECH	CSE	ADVANCED COMPUTING LAB	04 CS 6194
M TECH	CSE	DISTRIBUTED COMPUTING SYSTEMS	04 CS 7103
M TECH	CSE	WIRELESS SENSOR NETWORKS	04 CS 7105
M TECH	CSE	BIG DATA PROCESSING	04 CS7109
M TECH	CSE	RESEARCH METHODOLOGY	04 GN 6001
B TECH	ECE	ADVANCED COMMUNICATION SYSTEMS	EC404
B TECH	ECE	ANALOG COMMUNICATION ENGINEERING	EC208
B TECH	ECE	ANALOG INTEGRATED CIRCUITS	EC204
B TECH	ECE	ANALOG INTEGRATED CIRUITS LAB	EC232
B TECH	ECE	ANTENNA & WAVE PROPAGATION	EC306
B TECH	ECE	APPLIED ELECTROMAGNETIC THEORY	EC303
B TECH	ECE	BASICS OF CIVIL ENGG	CE100
B TECH	ECE	BASICS OF ELECTRICAL ENGG	EE100
B TECH	ECE	BASICS OF MECHANICAL ENGINEERING	ME100
B TECH	ECE	BIOMEDICAL ENGINEERING	EC365
B TECH	ECE	CALCULUS	MA101
B TECH	ECE	CIVIL ENGG WORKSHOP	CE110
B TECH	ECE	COMMUNICATION ENGINEERING LAB(ANALOG & DIGITAL)	EC332
B TECH	ECE	COMMUNICATION SYSTEMS LAB	EC431
B TECH	ECE	COMPREHENSIVE EXAM	EC352


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Program name	Program code	Name of the Course that include experiential learning through project work/field work/internship	Course code
B TECH	ECE	CONTROL SYSTEMS	EC409
B TECH	ECE	DESIGN & ENGINEERING	EST 200
B TECH	ECE	DESIGN PROJECT	EC 341
B TECH	ECE	DIGITAL SIGNAL PROCESSING	EC301
B TECH	ECE	DIGITAL SIGNAL PROCESSING LAB	EC333
B TECH	ECE	ELECTRONIC CIRCUITS	EC205
B TECH	ECE	ELECTRONIC DESIGN AUTOMATION LAB	EC233
B TECH	ECE	ELECTRONIC DEVICES & CIRCUITS LAB	EC231
B TECH	ECE	ELECTRONICS ENGINEERING WORKSHOP	EC110
B TECH	ECE	EMBEDDED SYSTEM	EC 308
B TECH	ECE	LOGIC CIRCUIT DESIGN	EC207
B TECH	ECE	LOGIC CIRCUIT DESIGN	EC230
B TECH	ECE	MICROCONTROLLER LAB	EC334
B TECH	ECE	MICROPROCESSORS AND MICROCONTROLLERS	EC305
B TECH	ECE	NETWORK THEORY	EC201
B TECH	ECE	POWER ELECTRONICS AND INSTRUMENTATION	EC307
B TECH	ECE	POWER ELECTRONICS AND INSTRUMENTATION LAB	EC335
B TECH	ECE	PROBABILITY DISTRIBUTIONS, RANDOM PROCESSES AND NUMERICAL METHODS	MA204
B TECH	ECE	PROJECT	EC 492
B TECH	ECE	PROJECT PRELIMINARY	EC 451
B TECH	ECE	REAL TIME OPERATING SYSTEMS	EC366
B TECH	ECE	RESPONSIBLE ENGINEERING	FS482
B TECH	ECE	SCIENTIFIC COMPUTING	ECL 201
B TECH	ECE	SIGNALS & SYSTEMS	EC202
B TECH	ECE	SOFT COMPUTING	EC363
B TECH	ECE	SOLID STATE DEVICES	EC203
B TECH	ECE	VLSI	EC304
M.TECH	SECM	ANALYTICAL METHODS IN ENGINEERING	04 CE 6401
M.TECH	SECM	INDUSTRIAL TRAINING	04 CE 7490
M.TECH	SECM	PROJECT PHASE I	04 CE 7493
M.TECH	SECM	PROJECT PHASE II	04 CE 7494
M.TECH	SECM	THEORY OF ELASTICITY	04 CE 6403
M.TECH	ECE-VLSI & ES	ADVANCED CMOS VLSI	04 EC 6504
M.TECH	SECM	ADVANCED CONCRETE TECHNOLOGY	04 CE 6418
M.TECH	SECM	ADVANCED DESIGN OF CONCRETE STRUCTURES	04 CE 6407
M.TECH	ECE-VLSI & ES	ADVANCED DIGITAL DESIGN	04 EC 6503
M.TECH	ECE-VLSI & ES	ANALOG INTEGRATED CIRCUITS	04 EC 6502
M.TECH	ECE-VLSI & ES	CMOS VLSI DESIGN	04 EC 6505
M.TECH	SECM	COMPUTER APPLICATION LAB	04 CE 6493
M.TECH	SECM	CONSTRUCTION METHODS & EQUIPMENTS	04 CE 6416
M.TECH	ECE-VLSI & ES	DESIGN LAB 1	04 EC 6593
M.TECH	ECE-VLSI & ES	DESIGN LAB 2	04 EC 6594

Program name	Program code	Name of the Course that Include experiential learning through project work/field work/internship	Course code
M.TECH	ECE-VLSI & ES	DESIGN WITH ARM MICROCONTROLLERS	04 EC 6507
M.TECH	ECE-VLSI & ES	EMBEDDED OPERATING SYSTEM & RTOS	04 EC 6506
M.TECH	SECM	MAINTENACE & REHABILITATION OF STRUCTURES	04 CE 7413
M.TECH	ECE-VLSI & ES	RESEARCH METHODOLOGY	04 GN6001
M.TECH	SECM	SEMINAR II	04 CE 7491
M.TECH	SECM	STRUCTURAL DYNAMICS	04 CE 6491
M.TECH	ECE-VLSI & ES	VLSI TECHNOLOGY	04 EC 6501
MTECH	VLSI & ES	MINI PROJECT	04 EC 6592
B TECH	EEE	COMPUTER PROGRAMMING	EE 207
B TECH	EEE	ADVANCED CONTROL THEORY	EE304
B TECH	EEE	ANALOG ELECTRONICS	EET205
B TECH	EEE	ANALOG ELECTRONICS LAB COURSE PROJECT	EEL203
B TECH	EEE	BIOMEDICAL INSTRUMENTATION	EE372
B TECH	EEE	CIRCUITS & NETWORKS	EET201
B TECH	EEE	CIRCUITS AND MEASUREMENTS LAB COURSE PROJECT	EEL201
B TECH	EEE	DESIGN & ENGINEERING	EST 200
B TECH	EEE	DESIGN PROJECT	EE341
B TECH	EEE	DIGITAL ELECTRONICS	EET 206
B TECH	EEE	DIGITAL ELECTRONICS LAB COURSE PROJECT	EEL204
B TECH	EEE	DIGITAL SIGNAL PROCESSING	EE407
B TECH	EEE	DISTRIBUTED GENERATION AND SMART GRIDS	EE403
B TECH	EEE	ELECTRICAL & ELECTRONICS WORKSHOP	ESL 130
B TECH	EEE	ELECTRICAL MACHINE DESIGN	EE409
B TECH	EEE	ELECTRICAL MACHINES LAB II	EE333
B TECH	EEE	ELECTRICAL SYSTEM DESIGN	EE405
B TECH	EEE	ELECTROMAGNETICS	EE302
B TECH	EEE	ENGINEERING PHYSICS	PHT 100
B TECH	EEE	ENGINEERING PHYSISCS LAB	PHL 120
B TECH	EEE	LINEAR CONTROL SYSTEMS	EE303
B TECH	EEE	MAIN PROJECT	EE492
B TECH	EEE	MEASUREMENTS & INSTRUMENTATION	EET203
B TECH	EEE	MICROPROCESSOR AND EMBEDDED SYSTEMS	EE309
B TECH	EEE	NEW AND RENEWABLE ENERGY SYSTEMS	EE367
B TECH	EEE	POWER ELECTRONICS	EE305
B TECH	EEE	POWER ELECTRONICS AND DRIVES LAB	EE334
B TECH	EEE	POWER GENERATION, TRANSMISSION AND PROTECTION	EE301
B TECH	EEE	POWER SYSTEM LAB	EE431
B TECH	EEE	PROGRAMMING IN C	EST 102
B TECH	EEE	SEMINAR & PROJECT PRELIMINARY	EE451
B TECH	EEE	SYSTEMS AND CONTROL LAB	EE332
M.TECH	PEPS	MAIN PROJECT	04EE7592
M.TECH	PEPS	RESEARCH METHODOLOGY	04 GN 6001
M.TECH	PEPS	PROJECT PHASE 1	04EE7493

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Program name	Program code	Name of the Course that include experiential learning through project work/field work/internship	Course code
B TECH	ME	PROBABILITY, STATISTICS AND NUMERICAL METHODS	MAT202
B TECH	ME	INDUSTRIAL ENGINEERING	ME 404
B TECH	ME	MECHANICS OF MACHINERY	ME301
B TECH	ME	HEAT & MASS TRANSFER	ME302
B TECH	ME	MACHINE TOOLS & DIGITAL MANUFACTURING	ME303
B TECH	ME	DYNAMICS OF MACHINERY	ME304
B TECH	ME	COMPUTER PROGRAMMING & NUMERICAL METHODS	ME305
B TECH	ME	ADVANCED MANUFACTURING TECHNOLOGY	ME306
B TECH	ME	COMPUTER AIDED DESIGN AND ANALYSIS	ME308
B TECH	ME	METROLOGY AND INSTRUMENTATION	ME312
B TECH	ME	MANUFACTURING TECHNOLOGY LAB I	ME331
B TECH	ME	COMPUTER AIDED DESIGN AND ANALYSIS LAB	ME332
B TECH	ME	MANUFACTURING TECHNOLOGY LAB II	ME334
B TECH	ME	DESIGN PROJECT	ME341
B TECH	ME	NON-DESTRUCTIVE TESTING	ME367
B TECH	ME	MARKETING MANAGAEMENT	ME368
B TECH	ME	DESIGN OF MACHINE ELEMENTS I	ME401
B TECH	ME	DESIGN OF MACHINE ELEMENTS II	ME402
B TECH	ME	ADVANCED ENERGY ENGINEERING	ME403
B TECH	ME	INDUSTRIAL ENGINEERING	ME404
B TECH	ME	REFRIGERATION & AIR CONDITIONING	ME405
B TECH	ME	MECHATRONICS	ME407
B TECH	ME	COMPRESSIBLE FLUID FLOW	ME409
B TECH	ME	MECHANICAL ENGINEERING LAB	ME431
B TECH	ME	SEMINAR AND PRELIMINARY	ME451
B TECH	ME	AUTOMOBILE ENGINEERING	ME463
B TECH	ME	MATERIAL HANDLING & FACILITIES PLANNING	ME476
B TECH	ME	PROJECT	ME492
B TECH	ME	COMPUTER AIDED MACHINE DRAWING	MEL201
B TECH	ME	FM & HM LAB	MEL202
B TECH	ME	MATERIALS TESTING LAB	MEL203
B TECH	ME	MACHINE TOOLS LAB-I	MEL204
B TECH	ME	MECHANICS OF SOLIDS	MET201
B TECH	ME	ENGINEERING THERMODYNAMICS	MET202
B TECH	ME	MECHANICS OF FLUIDS	MET203
B TECH	ME	MANUFACTURING PROCESS	MET204
B TECH	ME	METALLURGY & MATERIAL SCIENCE	MET205
B TECH	ME	FLUID MACHINERY	MET206
B TECH	ME	METROLOGY AND INSTRUMENTATION	MET312
B TECH	ME	ENGINEERING PHYSICS LAB	PHL120
B TECH	ME	ENGINEERING PHYSICS B	PHT110
M.TECH	IEM	RESEARCH METHODOLOGY	04 GN 6001



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Program name	Program code	Name of the Course that include experiential learning through project work/field work/internship	Course code
M.TECH	PEPS	SWITCHED MODE POWER CONVERTERS	04 EE 6302
M.TECH	PEPS	HIGH VOLTAGE DC TRANSMISSION	04EE 6432
M.TECH	PEPS	ELECTIVE - I ELECTRIC DRIVE SYSTEMS	04 EE 6200
M.TECH	PEPS	POWER SYSTEMS SIMULATION LAB	04 EE 6493
M.TECH	PEPS	POWER ELECTRONICS LAB	04 EE 6390
M.TECH	PEPS	FACTS & POWER QUALITY	04 EE 6444
M.TECH	PEPS	FACTS & POWER QUALITY	04 EE 6444
M.TECH	PEPS	POWER ELECTRONIC DEVICES & CIRCUITS	04 EE 6301
M.TECH	PEPS	EMBEDDED CONTROLLERS FOR POWER CONVERTORS	04 EE 6602
M.TECH	PEPS	RENEWABLE ENERGY SYSTEMS	04 EE 7503
M.TECH	PEPS	MINI PROJECT	04EE6492
M.TECH	PEPS	OPTIMIZATION TECHNIQUES FOR ENGINEERING APPLICATIONS	04 EE 6001
M.TECH	PEPS	COMPUTER APPLICATIONS IN POWER SYSTEMS	04 EE 6403
M.TECH	PEPS	POWER SYSTEM DYNAMICS AND STABILITY	04 EE 6418
M.TECH	PEPS	APPLICATIONS OF SPECIAL ELECTRICAL MACHINES	04 EE 6212
M.TECH	PEPS	POWER SYSTEM OPERATION AND CONTROL	04 EE 6405
M.TECH	PEPS	MODELLING AND ANALYSIS OF ELECTRICAL MACHINES	04 EE 6205
M.TECH	PEPS	INDUSTRIAL CONTROL ELECTRONICS	04 EE 7113
M.TECH	PEPS	INDUSTRIAL TRAINING	04EE7490
B TECH	ME	ENGINEERING MECHANICS	EST100
B TECH	ME	ENGINEERING CHEMISTRY LAB	CYL120
B TECH	ME	ENGINEERING CHEMISTRY	CYT100
B TECH	ME	ELECTRICAL DRIVES & CONTROL FOR AUTOMATION	EE311
B TECH	ME	ELECTRICAL & ELECTRONICS LAB	EE335
B TECH	ME	CIVIL & MECHANICAL WORKSHOP	ESL120
B TECH	ME	ELECTRICAL & ELECTRONICS WORKSHOP	ESL130
B TECH	ME	ENGINEERING MECHANICS	EST100
B TECH	ME	PROGRAMMING IN C	EST102
B TECH	ME	ENGINEERING GRAPHICS	EST110
B TECH	ME	BASICS OF CIVIL & MECHANICAL ENGINEERING	EST120
B TECH	ME	BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING	EST130
B TECH	ME	DESIGN AND ENGINEERING	EST200
B TECH	ME	PRINCIPLES OF MANAGEMENT	HS300
B TECH	ME	LINEAR ALGEBRA AND CALCULUS	MAT101
B TECH	ME	VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TRANSFORMS	MAT102
B TECH	ME	PARTIAL DIFFERENTIAL EQUATION AND COMPLEX ANALYSIS	MAT201





KERALA TECHNOLOGICAL UNIVERSITY

**Curriculum for
Semesters I and II**

2015

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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	0-0-2	2	1
		(CS110 for CS and related branches and CH110 for CH and related branches only)	+ 0-0-2	2	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

Notes:

1. Basic Engineering course of the parent branch included as *Introduction to _____ Engineering*. (3 credits)

List of Courses offered under BE 101-0X and Branches associated with each course

1. **BE101-01 Introduction to Civil Engineering**
Civil Engineering
 2. **BE101-02 Introduction to Mechanical Engineering Sciences**
Aeronautical Engineering, Automobile Engineering, Food Technology, Industrial Engineering, Marine Engineering, Mechanical Engineering, Mechanical Engineering (Automobile), Mechanical Engineering (Industry Integrated), Mechanical Engineering (Production), Mechatronics, Metallurgy, Naval Architecture & Ship Building Engineering, Printing Technology, Production Engineering, Textile Technology.
 3. **BE101-03 Introduction to Electrical Engineering**
Electrical & Electronics Engineering, Electrical Engineering
 4. **BE101-04 Introduction to Electronics Engineering**
Applied Electronics & Instrumentation Engineering, Biomedical Engineering, Electronics & Biomedical Engineering, Electronics, Electronics & Communication Engineering, Electronics & Communication Engineering (Industry Integrated), Electronics Engineering, Electronics & Instrumentation Engineering, Instrumentation & Control Engineering, Instrumentation Technology.
 5. **BE101-05 Introduction to Computing and Problem Solving**
Computer Engineering, Computer Science & Engineering, Information Technology.
 6. **BE101-06 Introduction to Chemical Engineering**
Biotechnology, Biotechnology & Biochemical Engineering, Chemical Engineering.
2. Institutions can recommend **one of four** other Basic Engineering courses offered during this semester for every branch. However, the basic course selected should **exclude** the one corresponding to their branch of specialization. eg. Student who took Introduction to Civil Engineering should not take Basics of Civil Engineering; student who took Introduction to Electrical Engineering should not take Basics of Electrical Engineering


3. The six basic engineering workshops will be connected with the Introductory or Basics of Engineering courses offered. The students should attend **two workshops in Semester 1 and two in Semester 2.**

For example, students opting *Introduction to Civil Engineering* or Basics of Civil Engineering should attend the *Civil Engineering Workshop*, students opting *Introduction to Mechanical Engineering* or Basics of Mechanical Engineering should attend the *Mechanical Engineering Workshop*, students opting *Introduction to Chemical Engineering* should attend the *Chemical Engineering Workshop* and students opting *Introduction to Computing and Problem Solving* should attend the *Computer Science Workshop* etc. In addition, the students should attend one more workshop course in Semester 1, corresponding to the other Basic Engineering course they had been assigned by the institution. The workshop courses corresponding to both introductory and basic courses are same. However, the institutions may allot exercises or experiments listed in the syllabus based on the contents of corresponding theory course.

4. Engineering Physics 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 in S1 and Engineering Chemistry in S2 and vice versa. Students opting for Engineering Physics in S1 should attend Engineering Physics Lab in S1 and students opting for Engineering Chemistry in S1 should opt for Engineering Chemistry Lab in S1.

5. Engineering Mechanics and Engineering Graphics shall be offered in both semesters. Institutions can advise students belonging to about 50% of number of branches in the institution to opt for Engineering Mechanics in Semester 1 and Engineering Graphics in Semester 2 and vice versa.

6. It may be noted that for items 4 and 5 above, all students belonging to a particular branch of study must be assigned the same course during one semester. For example, all students belonging to Electrical and Electronics Engineering in an institution may be assigned Engineering Physics and Engineering Physics lab, while all students in Electronics and Communication Engineering branch may be assigned Engineering Chemistry and Chemistry lab. Likewise, all students in Civil Engineering branch may be assigned Engineering Graphics, while all students in Mechanical Engineering branch may be allotted the Engineering Mechanics in Semester 1 and vice versa in Semester 2.


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7. For **Course U**, the Institutions should conduct **diagnostic tests** to identify the training requirements of each student and advise them to attend the suitable programme. The students who excel in all diagnostic tests can be assigned **Micro projects** under the guidance of faculty members.

8. **Course V** is for earning activity points, the details are covered in rules and regulations of KTU.



PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

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

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Curriculum

for

B.Tech Degree

Semesters III to VIII

2016

Mechanical Engineering

Estd.



APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

CET CAMPUS, THIRUVANANTHAPURAM – 695016

KERALA, INDIA

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Email: university@ktu.edu.in

PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

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

Principal
MANGALAM COLLEGE OF ENGINEERING
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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

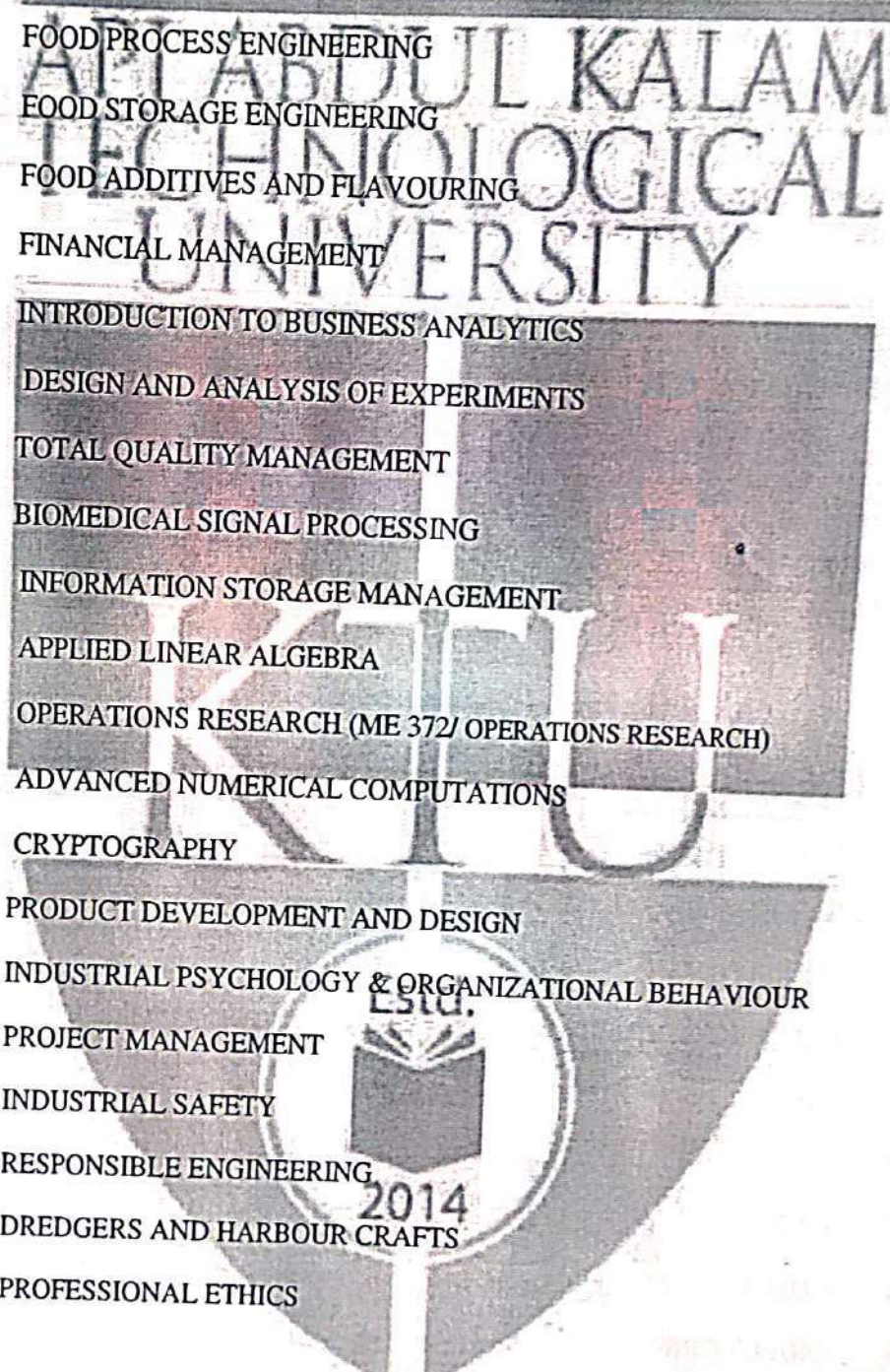

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MANGALAM COLLEGE OF ENGINEERING
 Ettumanoor

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



[Signature]
 PRINCIPAL
 MANGALAM COLLEGE OF ENGINEERING
 Ettumanoor

ENGINEERING



KERALA TECHNOLOGICAL UNIVERSITY

**Curriculum for
Semesters I and II**

2015

Kerala Technological University
CET Campus, Thiruvananthapuram
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Email: university@ktu.edu.in

PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

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	0-0-2	2	1
		(CS110 for CS and related branches and CH110 for CH and related branches only)	+ 0-0-2	2	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

Notes:

1. Basic Engineering course of the parent branch included as Introduction to _____ Engineering. (3 credits)

List of Courses offered under BE 101-0X and Branches associated with each course

1. **BE101-01 Introduction to Civil Engineering**
Civil Engineering
2. **BE101-02 Introduction to Mechanical Engineering Sciences**
Aeronautical Engineering, Automobile Engineering, Food Technology, Industrial Engineering, Marine Engineering, Mechanical Engineering, Mechanical Engineering (Automobile), Mechanical Engineering (Industry Integrated), Mechanical Engineering (Production), Mechatronics, Metallurgy, Naval Architecture & Ship Building Engineering, Printing Technology, Production Engineering, Textile Technology.
3. **BE101-03 Introduction to Electrical Engineering**
Electrical & Electronics Engineering, Electrical Engineering
4. **BE101-04 Introduction to Electronics Engineering**
Applied Electronics & Instrumentation Engineering, Biomedical Engineering, Electronics & Biomedical Engineering, Electronics, Electronics & Communication Engineering, Electronics & Communication Engineering (Industry Integrated), Electronics Engineering, Electronics & Instrumentation Engineering, Instrumentation & Control Engineering, Instrumentation Technology.
5. **BE101-05 Introduction to Computing and Problem Solving**
Computer Engineering, Computer Science & Engineering, Information Technology.
6. **BE101-06 Introduction to Chemical Engineering**
Biotechnology, Biotechnology & Biochemical Engineering, Chemical Engineering.

2. Institutions can recommend **one of four** other Basic Engineering courses offered during this semester for every branch. However, the basic course selected should exclude the one corresponding to their branch of specialization. eg. Student who took Introduction to Civil Engineering should not take Basics of Civil Engineering; student who took Introduction to Electrical Engineering should not take Basics of Electrical Engineering

3. The six basic engineering workshops will be connected with the Introductory or Basics of Engineering courses offered. The students should attend **two workshops in Semester 1 and two in Semester 2.**

For example, students opting *Introduction to Civil Engineering* or Basics of Civil Engineering should attend the *Civil Engineering Workshop*, students opting *Introduction to Mechanical Engineering* or Basics of Mechanical Engineering should attend the *Mechanical Engineering Workshop*, students opting *Introduction to Chemical Engineering* should attend the *Chemical Engineering Workshop* and students opting *Introduction to Computing and Problem Solving* should attend the *Computer Science Workshop* etc. In addition, the students should attend one more workshop course in Semester 1, corresponding to the other Basic Engineering course they had been assigned by the institution. The workshop courses corresponding to both introductory and basic courses are same. However, the institutions may allot exercises or experiments listed in the syllabus based on the contents of corresponding theory course. •

4. Engineering Physics 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 in S1 and Engineering Chemistry in S2 and vice versa. Students opting for Engineering Physics in S1 should attend Engineering Physics Lab in S1 and students opting for Engineering Chemistry in S1 should opt for Engineering Chemistry Lab in S1.

5. Engineering Mechanics and Engineering Graphics shall be offered in both semesters. Institutions can advise students belonging to about 50% of number of branches in the institution to opt for Engineering Mechanics in Semester 1 and Engineering Graphics in Semester 2 and vice versa.

6. It may be noted that for items 4 and 5 above, all students belonging to a particular branch of study must be assigned the same course during one semester. For example, all students belonging to Electrical and Electronics Engineering in an institution may be assigned Engineering Physics and Engineering Physics lab, while all students in Electronics and Communication Engineering branch may be assigned Engineering Chemistry and Chemistry lab. Likewise, all students in Civil Engineering branch may be assigned Engineering Graphics, while all students in Mechanical Engineering branch may be allotted the Engineering Mechanics in Semester 1 and vice versa in Semester 2.

7. For **Course U**, the Institutions should conduct **diagnostic tests** to identify the training requirements of each student and advise them to attend the suitable programme. The students who excel in all diagnostic tests can be assigned **Micro projects** under the guidance of faculty members.

8. **Course V** is for earning activity points, the details are covered in rules and regulations of KTU.



PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING

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

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Curriculum

for

B.Tech Degree

Semesters III to VIII

2016

Electrical and Electronics Engineering

Estd.



APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

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Email: university@ktu.edu.in


PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
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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



PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
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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


PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
 Ettumanoor

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: 27 Cumulative 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


PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

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. 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



KERALA TECHNOLOGICAL UNIVERSITY

Curriculum for Semesters I and II

2015

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PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

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	0-0-2	2	1
		(CS110 for CS and related branches and CH110 for CH and related branches only)	+ 0-0-2	2	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


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Notes:

1. Basic Engineering course of the parent branch included as Introduction to _____ Engineering. (3 credits)

List of Courses offered under BE 101-0X and Branches associated with each course

1. **BE101-01 Introduction to Civil Engineering**

Civil Engineering

2. **BE101-02 Introduction to Mechanical Engineering Sciences**

Aeronautical Engineering, Automobile Engineering, Food Technology, Industrial Engineering, Marine Engineering, Mechanical Engineering, Mechanical Engineering (Automobile), Mechanical Engineering (Industry Integrated), Mechanical Engineering (Production), Mechatronics, Metallurgy, Naval Architecture & Ship Building Engineering, Printing Technology, Production Engineering, Textile Technology.

3. **BE101-03 Introduction to Electrical Engineering**

Electrical & Electronics Engineering, Electrical Engineering

4. **BE101-04 Introduction to Electronics Engineering**

Applied Electronics & Instrumentation Engineering, Biomedical Engineering, Electronics & Biomedical Engineering, Electronics, Electronics & Communication Engineering, Electronics & Communication Engineering (Industry Integrated), Electronics Engineering, Electronics & Instrumentation Engineering, Instrumentation & Control Engineering, Instrumentation Technology.

5. **BE101-05 Introduction to Computing and Problem Solving**

Computer Engineering, Computer Science & Engineering, Information Technology.

6. **BE101-06 Introduction to Chemical Engineering**

Biotechnology, Biotechnology & Biochemical Engineering, Chemical Engineering.

2. Institutions can recommend **one of four** other Basic Engineering courses offered during this semester for every branch. However, the basic course selected should exclude the one corresponding to their branch of specialization. eg. Student who took Introduction to Civil Engineering should not take Basics of Civil Engineering; student who took Introduction to Electrical Engineering should not take Basics of Electrical Engineering

3. The six basic engineering workshops will be connected with the *Introductory or Basics of Engineering* courses offered. The students should attend two workshops in Semester 1 and two in Semester 2.

For example, students opting *Introduction to Civil Engineering* or *Basics of Civil Engineering* should attend the *Civil Engineering Workshop*, students opting *Introduction to Mechanical Engineering* or *Basics of Mechanical Engineering* should attend the *Mechanical Engineering Workshop*, students opting *Introduction to Chemical Engineering* should attend the *Chemical Engineering Workshop* and students opting *Introduction to Computing and Problem Solving* should attend the *Computer Science Workshop* etc. In addition, the students should attend one more workshop course in Semester 1, corresponding to the other Basic Engineering course they had been assigned by the institution. The workshop courses corresponding to both introductory and basic courses are same. However, the institutions may allot exercises or experiments listed in the syllabus based on the contents of corresponding theory course.

4. Engineering Physics 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 in S1 and Engineering Chemistry in S2 and vice versa. Students opting for Engineering Physics in S1 should attend Engineering Physics Lab in S1 and students opting for Engineering Chemistry in S1 should opt for Engineering Chemistry Lab in S1.

5. Engineering Mechanics and Engineering Graphics shall be offered in both semesters. Institutions can advise students belonging to about 50% of number of branches in the institution to opt for Engineering Mechanics in Semester 1 and Engineering Graphics in Semester 2 and vice versa.

6. It may be noted that for items 4 and 5 above, all students belonging to a particular branch of study must be assigned the same course during one semester. For example, all students belonging to Electrical and Electronics Engineering in an institution may be assigned Engineering Physics and Engineering Physics lab, while all students in Electronics and Communication Engineering branch may be assigned Engineering Chemistry and Chemistry lab. Likewise, all students in Civil Engineering branch may be assigned Engineering Graphics, while all students in Mechanical Engineering branch may be allotted the Engineering Mechanics in Semester 1 and vice versa in Semester 2.


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7. For **Course U**, the Institutions should conduct **diagnostic tests** to identify the training requirements of each student and advise them to attend the suitable programme. The students who excel in all diagnostic tests can be assigned **Micro projects** under the guidance of faculty members.

8. **Course V** is for earning activity points, the details are covered in rules and regulations of KTU.

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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

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Curriculum

for

B.Tech Degree

Semesters III to VIII

2016

Electronics and Communication Engineering

Estd.



APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

CET CAMPUS, THIRUVANANTHAPURAM – 695016

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Phone +91 471 2598122, 2598422

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BRANCH: *Electronics & Communication Engineering*

SEMESTER - 3

BRANCH: F
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= 27/28 Cumulative Credits= 94

ENGINEERING


PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

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


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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

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BRANCH: Electronics & Communication Engineering

SEMESTER - 7

Course Code	Course Name	L-T-P	Credits	Exam Slot
EC401	Information Theory & Coding	2-0-0	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


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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


 PRINCIPAL
 MANGALAM COLLEGE OF ENGINEERING
 Ettumanoor



KERALA TECHNOLOGICAL UNIVERSITY

Curriculum for Semesters I and II

2015

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PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

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	0-0-2	2	1
		(CS110 for CS and related branches and CH110 for CH and related branches only)	0-0-2	2	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

Notes:

1. Basic Engineering course of the parent branch included as Introduction to _____ Engineering. (3 credits)

List of Courses offered under BE 101-0X and Branches associated with each course

1. **BE101-01 Introduction to Civil Engineering**
Civil Engineering
 2. **BE101-02 Introduction to Mechanical Engineering Sciences**
Aeronautical Engineering, Automobile Engineering, Food Technology, Industrial Engineering, Marine Engineering, Mechanical Engineering, Mechanical Engineering (Automobile), Mechanical Engineering (Industry Integrated), Mechanical Engineering (Production), Mechatronics, Metallurgy, Naval Architecture & Ship Building Engineering, Printing Technology, Production Engineering, Textile Technology.
 3. **BE101-03 Introduction to Electrical Engineering**
Electrical & Electronics Engineering, Electrical Engineering
 4. **BE101-04 Introduction to Electronics Engineering**
Applied Electronics & Instrumentation Engineering, Biomedical Engineering, Electronics & Biomedical Engineering, Electronics, Electronics & Communication Engineering, Electronics & Communication Engineering (Industry Integrated), Electronics Engineering, Electronics & Instrumentation Engineering, Instrumentation & Control Engineering, Instrumentation Technology.
 5. **BE101-05 Introduction to Computing and Problem Solving**
Computer Engineering, Computer Science & Engineering, Information Technology.
 6. **BE101-06 Introduction to Chemical Engineering**
Biotechnology, Biotechnology & Biochemical Engineering, Chemical Engineering.
2. Institutions can recommend **one of four** other Basic Engineering courses offered during this semester for every branch. However, the basic course selected should exclude the one corresponding to their branch of specialization. eg. Student who took Introduction to Civil Engineering should not take Basics of Civil Engineering; student who took Introduction to Electrical Engineering should not take Basics of Electrical Engineering

3. The six basic engineering workshops will be connected with the Introductory or Basics of Engineering courses offered. The students should attend **two workshops in Semester 1 and two in Semester 2.**

For example, students opting *Introduction to Civil Engineering* or Basics of Civil Engineering should attend the *Civil Engineering Workshop*, students opting *Introduction to Mechanical Engineering* or Basics of Mechanical Engineering should attend the *Mechanical Engineering Workshop*, students opting *Introduction to Chemical Engineering* should attend the *Chemical Engineering Workshop* and students opting *Introduction to Computers and Problem Solving* should attend the *Computer Science Workshop* etc. In addition, the students should attend one more workshop course in Semester 1, corresponding to the other Basic Engineering course they had been assigned by the institution. The workshop courses corresponding to both introductory and basic courses are same. However, the institutions may allot exercises or experiments listed in the syllabus based on the contents of corresponding theory course.

4. Engineering Physics 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 in S1 and Engineering Chemistry in S2 and vice versa. Students opting for Engineering Physics in S1 should attend Engineering Physics Lab in S1 and students opting for Engineering Chemistry in S1 should opt for Engineering Chemistry Lab in S1.

5. Engineering Mechanics and Engineering Graphics shall be offered in both semesters. Institutions can advise students belonging to about 50% of number of branches in the institution to opt for Engineering Mechanics in Semester 1 and Engineering Graphics in Semester 2 and vice versa.

6. It may be noted that for items 4 and 5 above, all students belonging to a particular branch of study must be assigned the same course during one semester. For example, all students belonging to Electrical and Electronics Engineering in an institution may be assigned Engineering Physics and Engineering Physics lab, while all students in Electronics and Communication Engineering branch may be assigned Engineering Chemistry and Chemistry lab. Likewise, all students in Civil Engineering branch may be assigned Engineering Graphics, while all students in Mechanical Engineering branch may be allotted the Engineering Mechanics in Semester 1 and vice versa in Semester 2.

7. For **Course U**, the Institutions should conduct **diagnostic tests** to identify the training requirements of each student and advise them to attend the suitable programme. The students who excel in all diagnostic tests can be assigned **Micro projects** under the guidance of faculty members.

8. **Course V** is for earning activity points, the details are covered in rules and regulations of KTU.



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MANGALAM COLLEGE OF ENGINEERING
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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.


PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Curriculum

for

B.Tech Degree

Semesters III to VIII

2016

Computer Science and Engineering

Estd.



APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

CET CAMPUS, THIRUVANANTHAPURAM – 695016

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PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

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	G
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


 PRINCIPAL
 MANGALAM COLLEGE OF ENGINEERING
 Ettumanoor

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

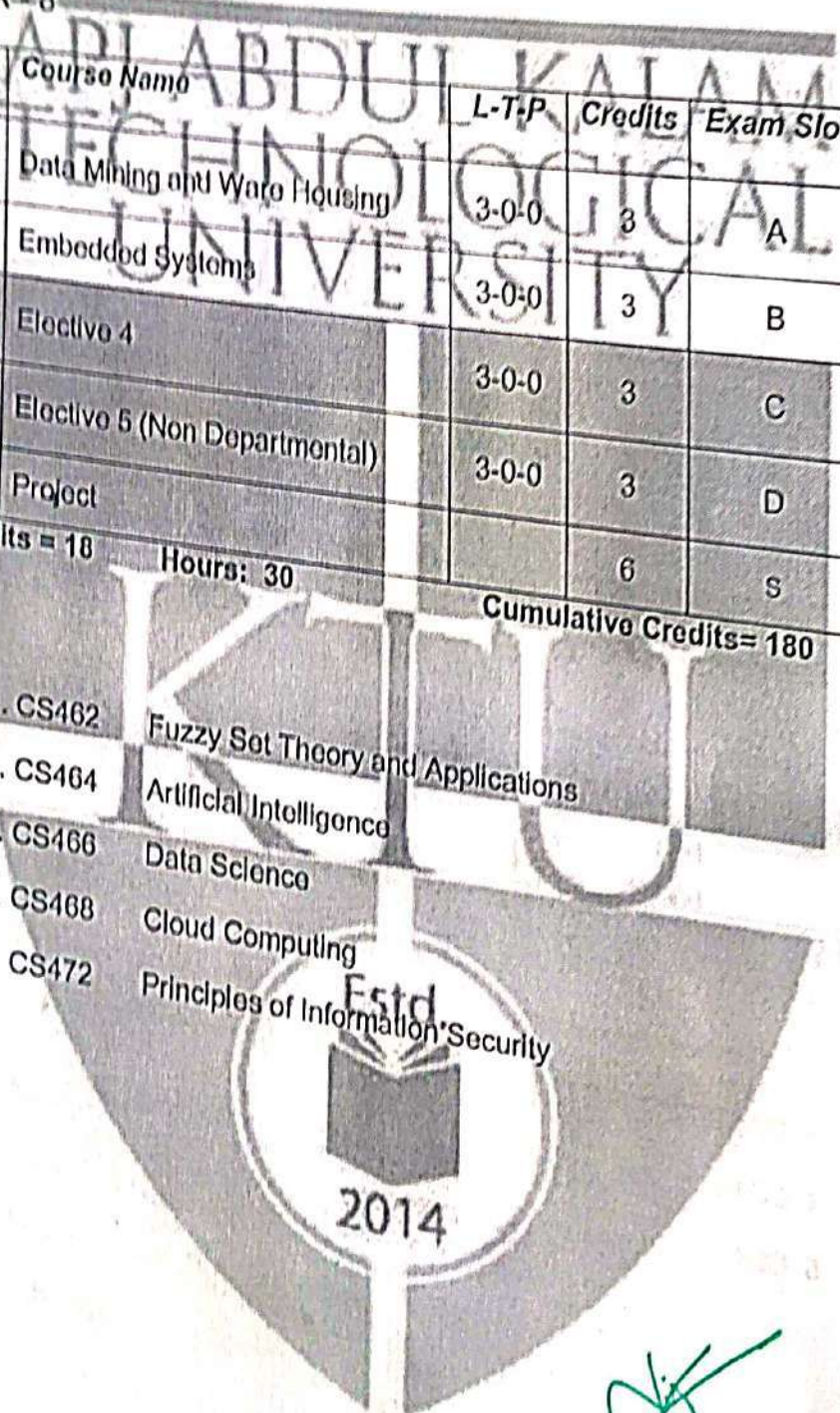
BRANCH: **Computer Science & Engineering**

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



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PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

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. 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



KERALA TECHNOLOGICAL UNIVERSITY

**Curriculum for
Semesters I and II**

2015

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PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

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/TBUNCC/NSS/ Physical Edu. etc	0-0-2	2	Activity points

Notes:

1. Basic Engineering course of the parent branch included as Introduction to _____ Engineering. (3 credits)

List of Courses offered under BE 101-0X and Branches associated with each course

1. **BE101-01 Introduction to Civil Engineering**
Civil Engineering
 2. **BE101-02 Introduction to Mechanical Engineering Sciences**
Aeronautical Engineering, Automobile Engineering, Food Technology, Industrial Engineering, Marine Engineering, Mechanical Engineering, Mechanical Engineering (Automobile), Mechanical Engineering (Industry Integrated), Mechanical Engineering (Production), Mechatronics, Metallurgy, Naval Architecture & Ship Building Engineering, Printing Technology, Production Engineering, Textile Technology.
 3. **BE101-03 Introduction to Electrical Engineering**
Electrical & Electronics Engineering, Electrical Engineering
 4. **BE101-04 Introduction to Electronics Engineering**
Applied Electronics & Instrumentation Engineering, Biomedical Engineering, Electronics & Biomedical Engineering, Electronics, Electronics & Communication Engineering, Electronics & Communication Engineering (Industry Integrated), Electronics Engineering, Electronics & Instrumentation Engineering, Instrumentation & Control Engineering, Instrumentation Technology.
 5. **BE101-05 Introduction to Computing and Problem Solving**
Computer Engineering, Computer Science & Engineering, Information Technology.
 6. **BE101-06 Introduction to Chemical Engineering**
Biotechnology, Biotechnology & Biochemical Engineering, Chemical Engineering.
2. Institutions can recommend one of four other Basic Engineering courses offered during this semester for every branch. However, the basic course selected should exclude the one corresponding to their branch of specialization. eg. Student who took Introduction to Civil Engineering should not take Basics of Civil Engineering; student who took Introduction to Electrical Engineering should not take Basics of Electrical Engineering


3. The six basic engineering workshops will be connected with the Introductory or Basics of Engineering courses offered. The students should attend **two workshops in Semester 1 and two in Semester 2.**

For example, students opting *Introduction to Civil Engineering* or Basics of Civil Engineering should attend the *Civil Engineering Workshop*, students opting *Introduction to Mechanical Engineering* or Basics of Mechanical Engineering should attend the *Mechanical Engineering Workshop*, students opting *Introduction to Chemical Engineering* should attend the *Chemical Engineering Workshop* and students opting *Introduction to Computing and Problem Solving* should attend the *Computer Science Workshop* etc. In addition, the students should attend one more workshop course in Semester 1, corresponding to the other Basic Engineering course they had been assigned by the institution. The workshop courses corresponding to both introductory and basic courses are same. However, the institutions may allot exercises or experiments listed in the syllabus based on the contents of corresponding theory course.

4. Engineering Physics 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 in S1 and Engineering Chemistry in S2 and vice versa. Students opting for Engineering Physics in S1 should attend Engineering Physics Lab in S1 and students opting for Engineering Chemistry in S1 should opt for Engineering Chemistry Lab in S1.

5. Engineering Mechanics and Engineering Graphics shall be offered in both semesters. Institutions can advise students belonging to about 50% of number of branches in the institution to opt for Engineering Mechanics in Semester 1 and Engineering Graphics in Semester 2 and vice versa.

6. It may be noted that for items 4 and 5 above, all students belonging to a particular branch of study must be assigned the same course during one semester. For example, all students belonging to Electrical and Electronics Engineering in an institution may be assigned Engineering Physics and Engineering Physics lab, while all students in Electronics and Communication Engineering branch may be assigned Engineering Chemistry and Chemistry lab. Likewise, all students in Civil Engineering branch may be assigned Engineering Graphics, while all students in Mechanical Engineering branch may be allotted the Engineering Mechanics in Semester 1 and vice versa in Semester 2.


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7. For **Course U**, the Institutions should conduct **diagnostic tests** to identify the training requirements of each student and advise them to attend the suitable programme. The students who excel in all diagnostic tests can be assigned **Micro projects** under the guidance of faculty members.

8. **Course V** is for earning activity points, the details are covered in rules and regulations of KTU.


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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	BSG	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

CIVIL 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 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.

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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
1	Aeronautical Engg	AO	20	Food Technology	FT
2	Applied Electronics & Instrumentation	AE	21	Humanities	HU
3	Artificial Intelligence	AI	22	Industrial Engg	IE
4	Artificial Intelligence & Data Science	AD	23	Information Technology	IT
5	Automobile	AU	24	Instrumentation & Control	IC
6	Biomedical Engg	BM	25	Mandatory Courses	MC
7	Biotechnology	BT	26	Mathematics	MA
8	Chemical Engg	CH	27	Mechanical Engg	ME
9	Chemistry	CY	28	Mechatronics	MR
10	Civil Engg	CE	29	Metallurgy	MT
11	Computer Science	CS	30	Mechanical (Auto)	MU
12	Computer Science (Artificial Intelligence)	CA	31	Mechanical (Prod)	MP
13	Computer Science (Artificial Intelligence & Machine Learning)	CM	32	Naval & Ship Building	SB
14	Computer Science (Data Science)	CD	33	Physics	PH
15	Computer Science Cyber Security	CC	34	Polymer Engg	PO
16	Electronics & Biomedical	EB	35	Production Engg	PE
17	Electronics & Communication	EC	36	Robotics and Automation	RA
18	Electrical and Computer Engineering	EO	37	Safety & Fire Engg	FS
19	Electrical & Electronics	EE			

CIVIL ENGINEERING

SEMESTER I

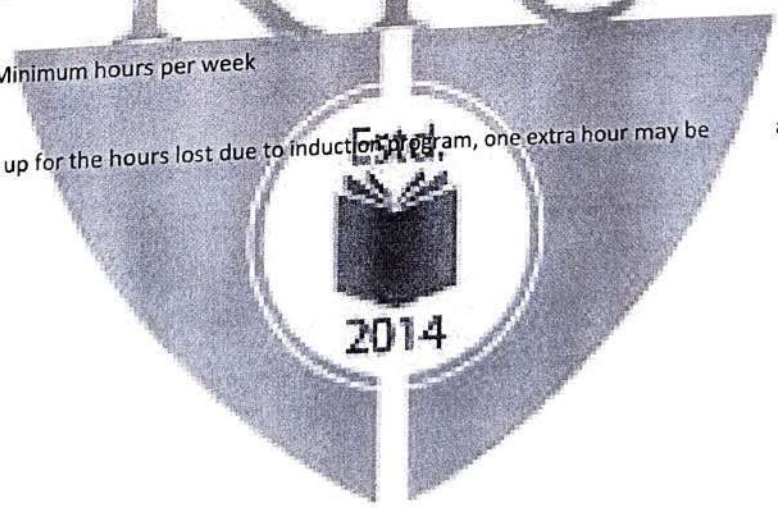
SLO T	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	MAT 101	LINEAR ALGEBRA AND CALCULUS	3-1-0	4	4
B	PHT 110	ENGINEERING PHYSICS B	3-1-0	4	4
1/2	CYT 100	ENGINEERING CHEMISTRY	3-1-0	4	4
	EST 100	ENGINEERING MECHANICS	2-1-0	3	3
1/2	EST 110	ENGINEERING GRAPHICS	2-0-2	4	3
	EST 120	BASICS OF CIVIL & MECHANICAL ENGINEERING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



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CIVIL ENGINEERING

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	HUN 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:

- 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.
- 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.
- 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.


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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.




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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:

- 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.

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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:

- 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.

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CIVIL ENGINEERING

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:

- *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.

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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

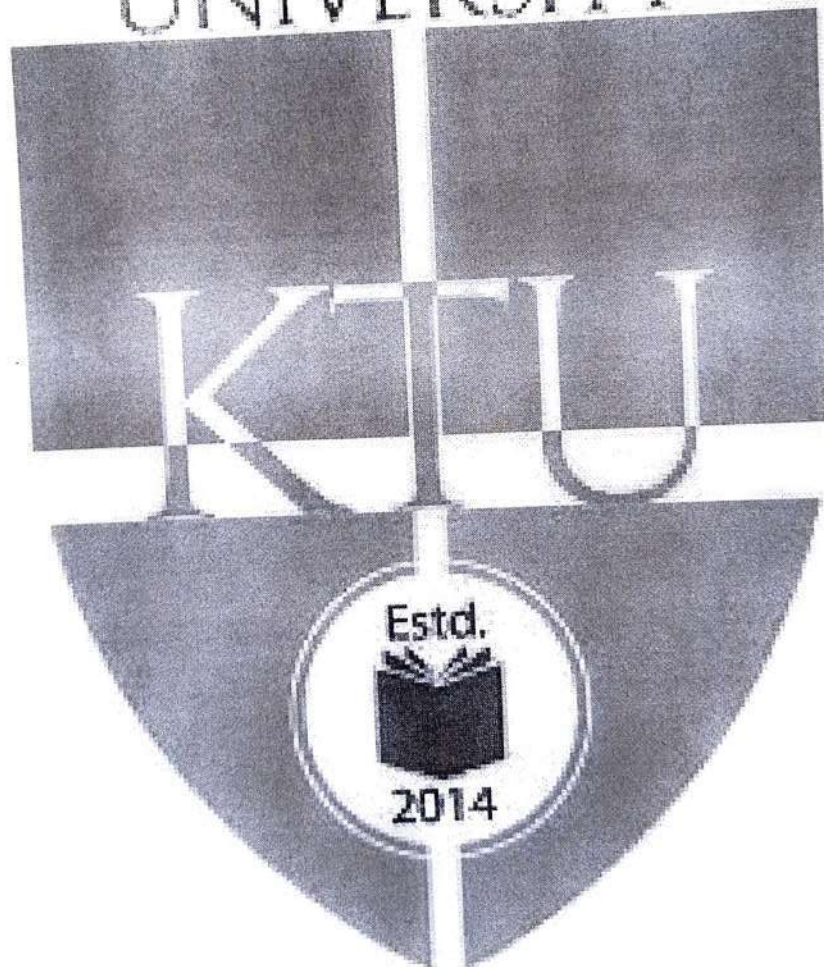
SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
D	CET312	ADVANCED COMPUTATIONAL METHODS	3-0-0	3	3
	CET322	GEOTECHNICAL INVESTIGATION	3-0-0		
	CET332	TRAFFIC ENGINEERING & MANAGEMENT	3-0-0		
	CET342	MECHANICS OF FLUID FLOW	3-0-0		
	CET352	ADVANCED CONCRETE TECHNOLOGY	3-0-0		
	CET362	ENVIRONMENTAL IMPACT ASSESSMENT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


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CIVIL ENGINEERING

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 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.**




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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.


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CIVIL ENGINEERING

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	NATURAL DISASTERS AND MITIGATION	2-1-0		
	CET455	ENVIRONMENTAL HEALTH AND SAFETY	2-1-0		
	CET465	GEOINFORMATICS	2-1-0		

NOTE:

- *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 a minor/honours programme, he/she can be given remedial class.
- 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

- 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:

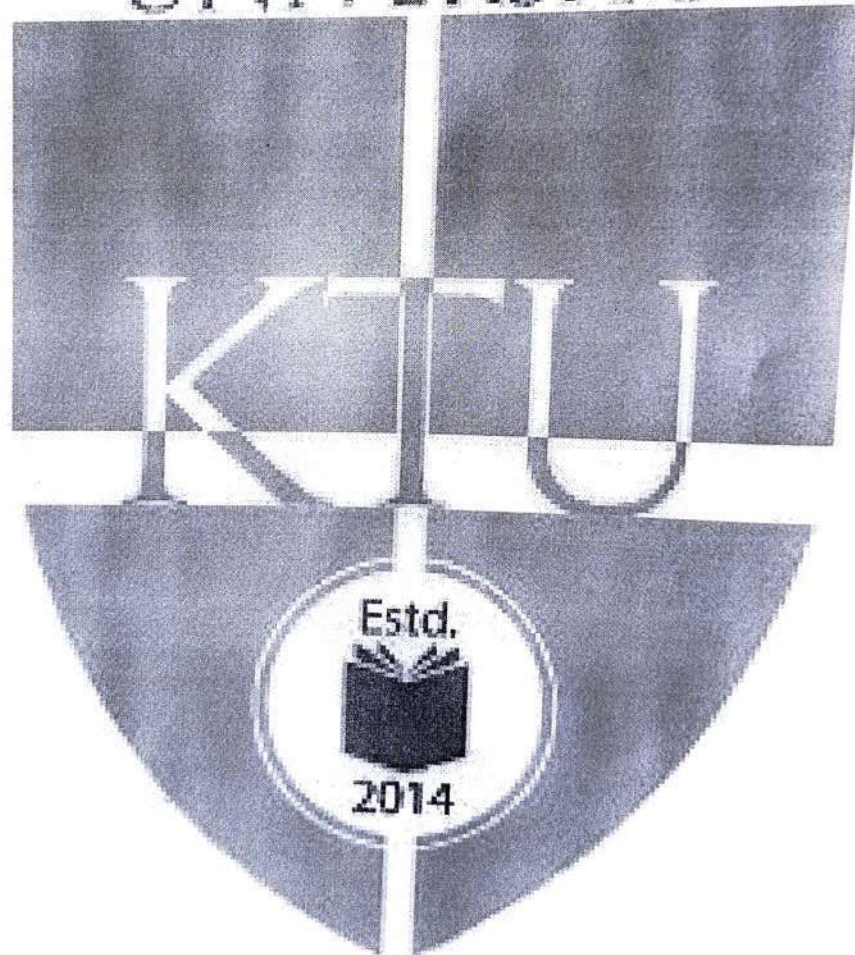
- Survey and study of published literature on the assigned topic;
- Preparing an Action Plan for conducting the investigation, including team work;
- Working out a preliminary Approach to the Problem relating to the assigned topic;
- Block level design documentation
- Conducting preliminary Analysis/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


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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.	

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CIVIL ENGINEERING

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		


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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 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
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 basket of 3-6 courses 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:

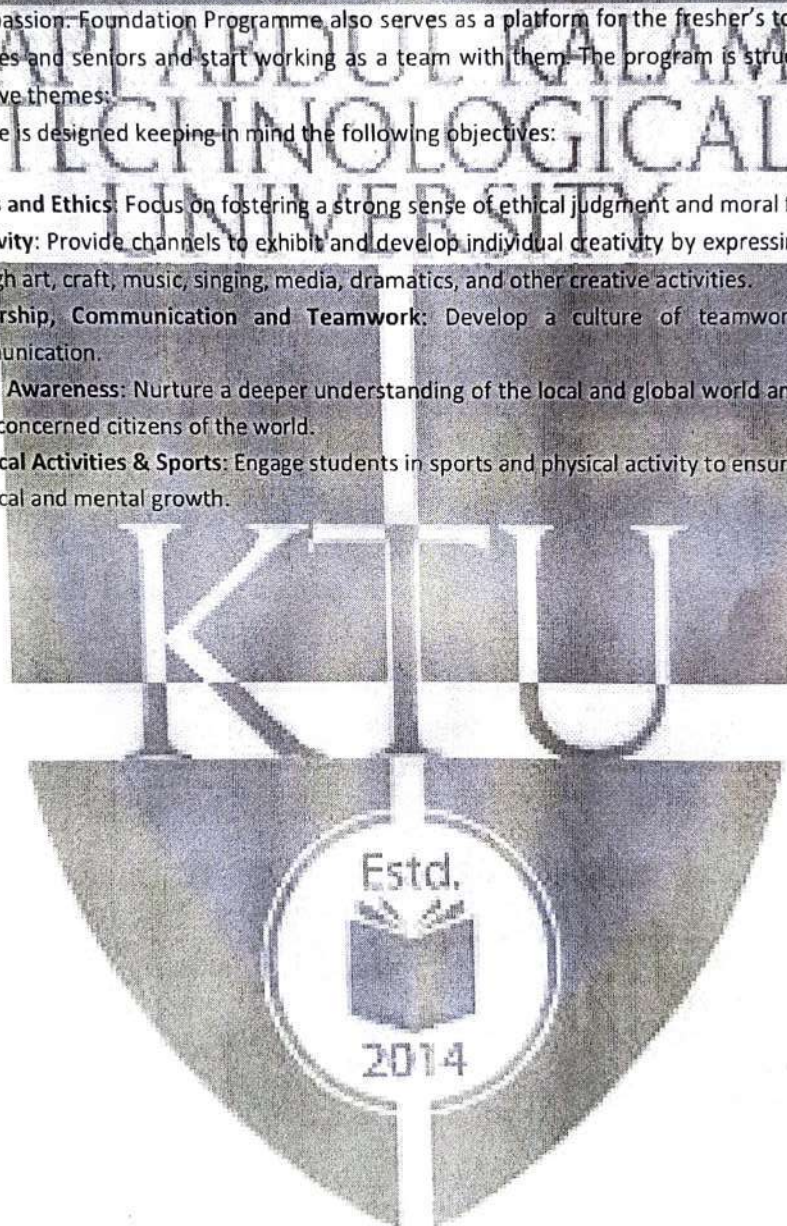

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INDUCTION PROGRAM

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.




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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,


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COMPUTER SCIENCE AND 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

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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
1	Aeronautical Engg	AO	20	Food Technology	FT
2	Applied Electronics & Instrumentation	AE	21	Humanities	HU
3	Artificial Intelligence	AI	22	Industrial Engg	IE
4	Artificial Intelligence & Data Science	AD	23	Information Technology	IT
5	Automobile	AU	24	Instrumentation & Control	IC
6	Biomedical Engg	BM	25	Mandatory Courses	MC
7	Biotechnology	BT	26	Mathematics	MA
8	Chemical Engg	CH	27	Mechanical Engg	ME
9	Chemistry	CY	28	Mechatronics	MR
10	Civil Engg	CE	29	Metallurgy	MT
11	Computer Science	CS	30	Mechanical (Auto)	MU
12	Computer Science (Artificial Intelligence)	CA	31	Mechanical (Prod)	MP
13	Computer Science (Artificial Intelligence & Machine Learning)	CM	32	Naval & Ship Building	SB
14	Computer Science (Data Science)	CD	33	Physics	PH
15	Computer Science Cyber Security	CC	34	Polymer Engg	PO
16	Electronics & Biomedical	EB	35	Production Engg	PE
17	Electronics & Communication	EC	36	Robotics and Automation	RA
18	Electrical and Computer Engineering	EO	37	Safety & Fire Engg	FS
19	Electrical & Electronics	EE			

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

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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	HUN 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


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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.

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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.

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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	MCN 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.


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SEMESTER IV

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	MAT 206	GRAPH THEORY	3-1-0	4	4
B	CST 202	COMPUTER ORGANIZATION 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	MCN 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.

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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	MCN 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.

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SEMESTER VI

SLOT	COURS E 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)

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 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:

- *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.
- 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.
- 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

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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	MCN 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.

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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 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;



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- > 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.


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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 466	vi DATA MINING	2-1-0		
	CST 476	vii MOBILE COMPUTING	2-1-0		



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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:

- *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.
- 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.
- 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:


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- 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

Interim evaluation, twice in the semester by the evaluation committee 70

Quality of the report evaluated by the above committee 10

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

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 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 form 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:


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MINOR BUCKETS												
S E M E S T E R	BUCKET-1				BUCKET-2				BUCKET-3			
	Specialization - Software Engineering				Specialization - Machine Learning				Specialization - Networking			
	CO UR SE NO	COURSE NAME	HO UR S	CR E D IT	CO UR SE NO	COURSE NAME	HO UR S	CR E D IT	CO UR SE NO	COURSE NAME	HO UR S	CR E D IT
S3	CST 281	OBJECT ORIENTED PROGRAMMING	4	4	CST 283	PYTHON FOR MACHINE LEARNING	4	4	CST 285	DATA COMMUNICAT ION	4	4
S4	CST 282	PROGRAMMING METHODOLOGIE S	4	4	CST 284	MATHEMATIC S FOR MACHINE LEARNING	4	4	CST 286	INTRODUCTIO N 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 APPLICATION S	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.

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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.

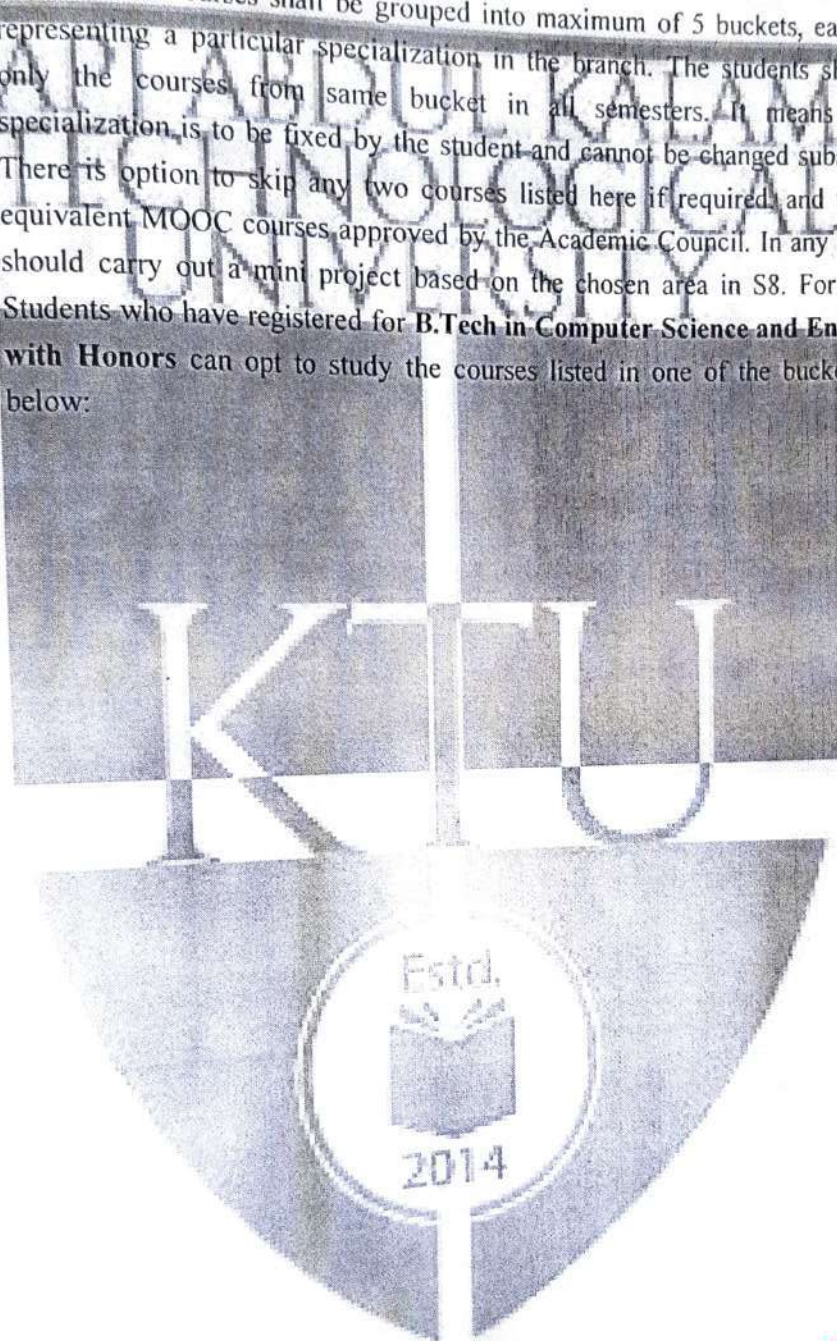
- (i) The curriculum/syllabus committee/BoS shall prepare syllabus for courses to be included in the curriculum from fourth to eight semesters for all branches. The Honors courses shall be identified by H slot courses.
- (ii) Registration is permitted for Honors at the beginning of fourth semester. Total 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

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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:




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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			
	CO URS E NO	COURSE NAME	H O U R S	C R E D I T	CO URS E NO	COURSE NAME	H O U R S	C R E D I T	CO URS E NO	COURSE NAME	H O U R S	C R E D I T
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

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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.




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ELECTRONICS & COMMUNICATION ENGINEERING 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	50	50	50	50	50	---	---
Credits for Activity	2	2	2	2	2	2	2	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 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 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.


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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
1	Aeronautical Engg	AO	20	Food Technology	FT
2	Applied Electronics & Instrumentation	AE	21	Humanities	HU
3	Artificial Intelligence	AI	22	Industrial Engg	IE
4	Artificial Intelligence & Data Science	AD	23	Information Technology	IT
5	Automobile	AU	24	Instrumentation & Control	IC
6	Biomedical Engg	BM	25	Mandatory Courses	MC
7	Biotechnology	BT	26	Mathematics	MA
8	Chemical Engg	CH	27	Mechanical Engg	ME
9	Chemistry	CY	28	Mechatronics	MR
10	Civil Engg	CE	29	Metallurgy	MT
11	Computer Science	CS	30	Mechanical (Auto)	MU
12	Computer Science (Artificial Intelligence)	CA	31	Mechanical (Prod)	MP
13	Computer Science (Artificial Intelligence & Machine Learning)	CM	32	Naval & Ship Building	SB
14	Computer Science (Data Science)	CD	33	Physics	PH
15	Computer Science Cyber Security	CC	34	Polymer Engg	PO
16	Electronics & Biomedical	EB	35	Production Engg	PE
17	Electronics & Communication	EC	36	Robotics and Automation	RA
18	Electrical and Computer Engineering	EO	37	Safety & Fire Engg	FS
19	Electrical & Electronics	EE			

SEMESTER I

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

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ELECTRONICS & COMMUNICATION 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	HUN 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:

- 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.
- 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.
- 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


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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.




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ELECTRONICS & COMMUNICATION 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	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.

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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:

- 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.


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ELECTRONICS & COMMUNICATION ENGINEERING

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:

- 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.
- *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.



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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

ELECTRONICS & COMMUNICATION 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.
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

Guide

Project Report

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

Estd. : 10

: 15

: 10

2014 : 40

ELECTRONICS & COMMUNICATION ENGINEERING

Semester VII

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	ECT 401	MICROWAVES AND ANTENNAS	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	Instrumentation	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.


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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:

- *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.
- 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

- 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;


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- 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

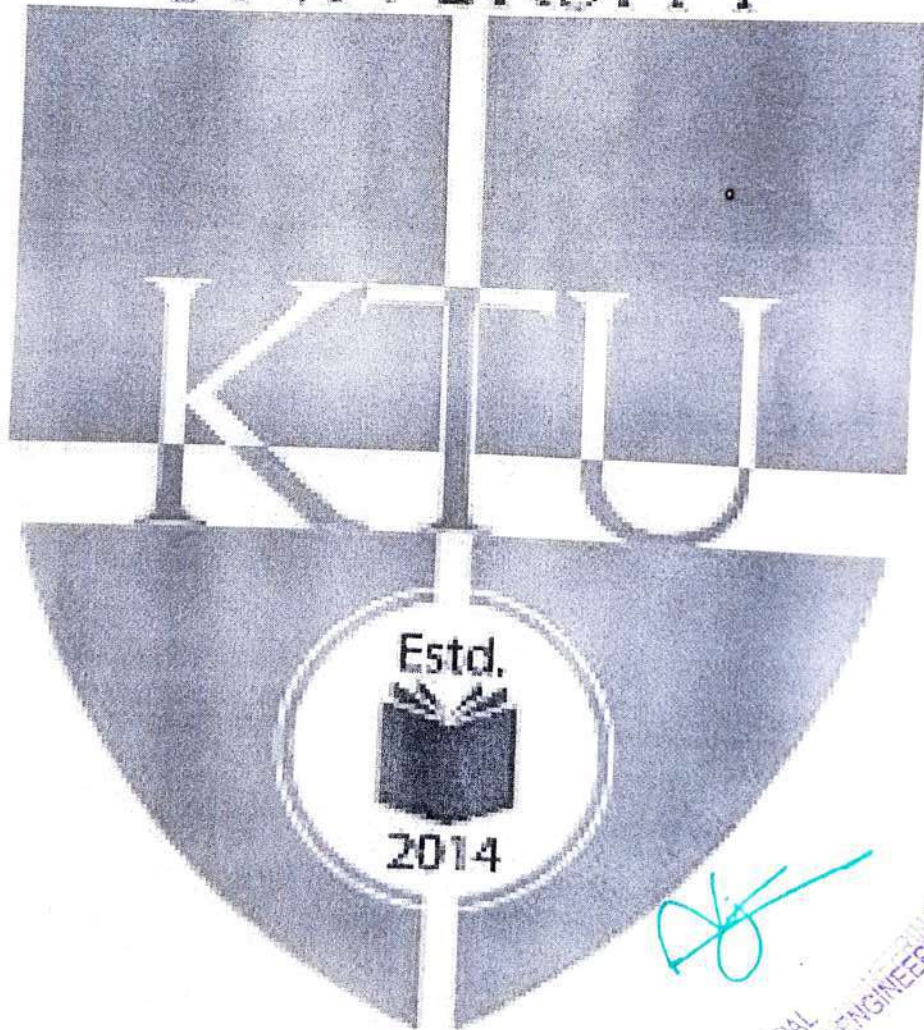
Guide : 30

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.




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Semester VIII

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	ECT 402	WIRELESS COMMUNICATION	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		

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PROGRAM ELECTIVE V

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
	ECT 418	Mechatronics	2-1-0		
	ECT 428	Optimization Techniques	2-1-0		
D	ECT 438	Computer Vision	2-1-0		3
	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 I, 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 Report;
 - 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

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

Interim evaluation, 2 times in the semester by the evaluation committee	: 30
Quality of the report evaluated by the above committee	: 50
(The evaluation committee comprises HoD or a senior faculty member, Project coordinator and project supervisor)	: 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.

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(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:

SEMESTER	BASKET I				BASKET II				BASKET III			
	COURSE NO.	COURSE NAME	HOURS	CREDITS	COURSE NO.	COURSE NAME	HOURS	CREDITS	COURSE NO.	COURSE NAME	HOURS	CREDITS
S3	ECT281	ELECTRONIC CIRCUITS	4	4	ECT283	ANALOG COMMUNICATION	4	4	ECT285	INTRODUCTION TO SIGNALS AND SYSTEMS	4	4
S4	ECT282	MICROCONTROLLERS	4	4	ECT284	DIGITAL COMMUNICATION	4	4	ECT286	INTRODUCTION TO DIGITAL SIGNAL PROCESSING	4	4
S5	ECT381	EMBEDDED SYSTEM DESIGN	4	4	ECT383	COMMUNICATION 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.

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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:


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ELECTRONICS & COMMUNICATION ENGINEERING

SEMESTER	GROUP I			GROUP II			GROUP III		
	COURSE NO.	COURSE NAME	HOURS	COURSE NO.	COURSE NAME	HOURS	COURSE NO.	COURSE NAME	HOURS
S4	ECT292	NANOELECTRONICS	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	COMPUTATIONAL TOOLS FOR SIGNAL PROCESSING	4 4
S6	ECT394	ELECTRONIC DESIGN AUTOMATION	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:

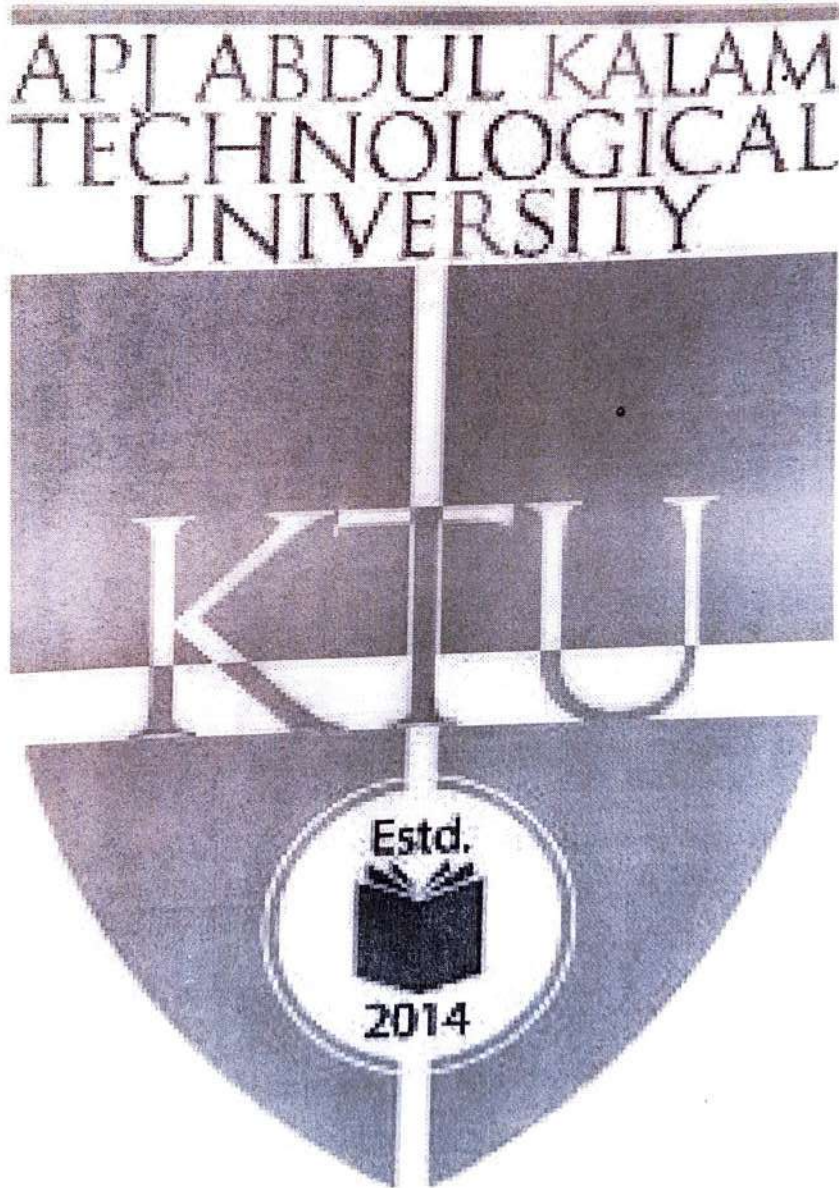
The programme is designed keeping in mind the following objectives:

- **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.


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- **Physical Activities & Sports:** Engage students in sports and physical activity to ensure healthy physical and mental growth.




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ELECTRICAL & ELECTRONICS ENGINEERING
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


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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.

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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
1	Aeronautical Engg	AO	20	Food Technology	FT
2	Applied Electronics & Instrumentation	AE	21	Humanities	HU
3	Artificial Intelligence	AI	22	Industrial Engg	IE
4	Artificial Intelligence & Data Science	AD	23	Information Technology	IT
5	Automobile	AU	24	Instrumentation & Control	IC
6	Biomedical Engg	BM	25	Mandatory Courses	MC
7	Biotechnology	BT	26	Mathematics	MA
8	Chemical Engg	CH	27	Mechanical Engg	ME
9	Chemistry	CY	28	Mechatronics	MR
10	Civil Engg	CE	29	Metallurgy	MT
11	Computer Science	CS	30	Mechanical (Auto)	MU
12	Computer Science (Artificial Intelligence)	CA	31	Mechanical (Prod)	MP
13	Computer Science (Artificial Intelligence & Machine Learning)	CM	32	Naval & Ship Building	SB
14	Computer Science (Data Science)	CD	33	Physics	PH
15	Computer Science Cyber Security	CC	34	Polymer Engg	PO
16	Electronics & Biomedical	EB	35	Production Engg	PE
17	Electronics & Communication	EC	36	Robotics and Automation	RA
18	Electrical and Computer Engineering	EO	37	Safety & Fire Engg	FS
19	Electrical & Electronics	EE			

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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

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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	HUN 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:

- 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.
- Engineering Mechanics and Engineering Graphics shall be offered in both semesters. Institutions can advise students belonging to about 50% of the number of branches

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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.



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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:

- 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.


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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.


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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:

- 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.
- *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.


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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		

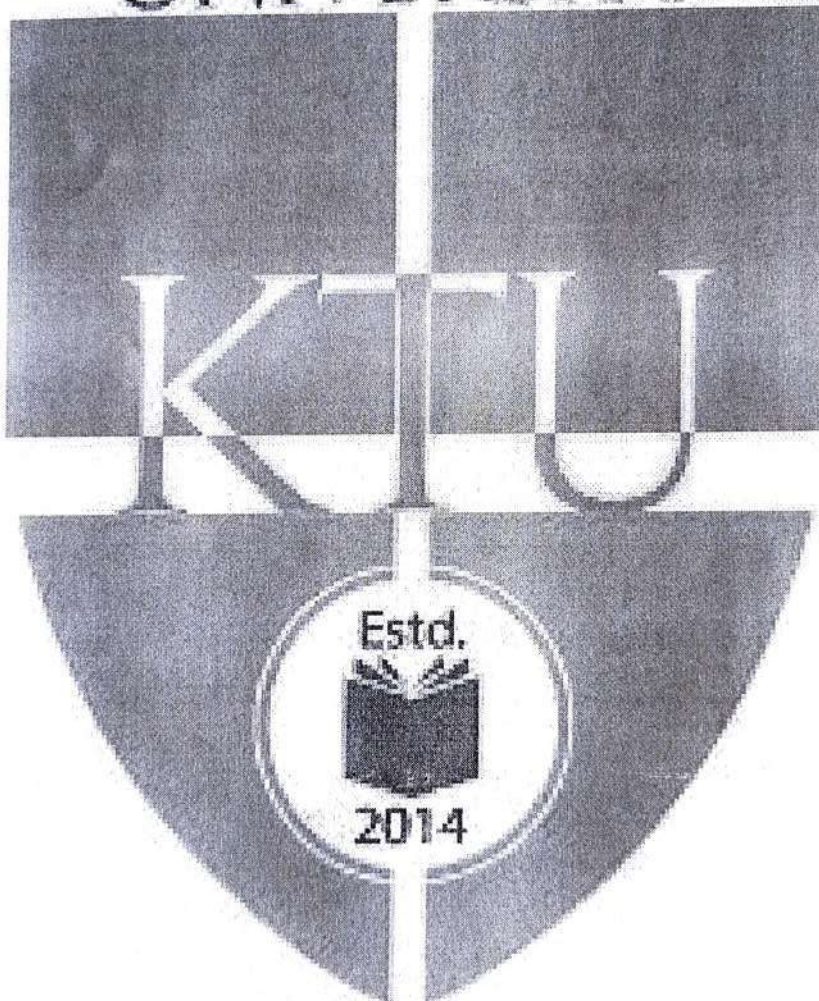
NOTE:

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.


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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 75. 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.



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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.

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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:

- *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.

- 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

- 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

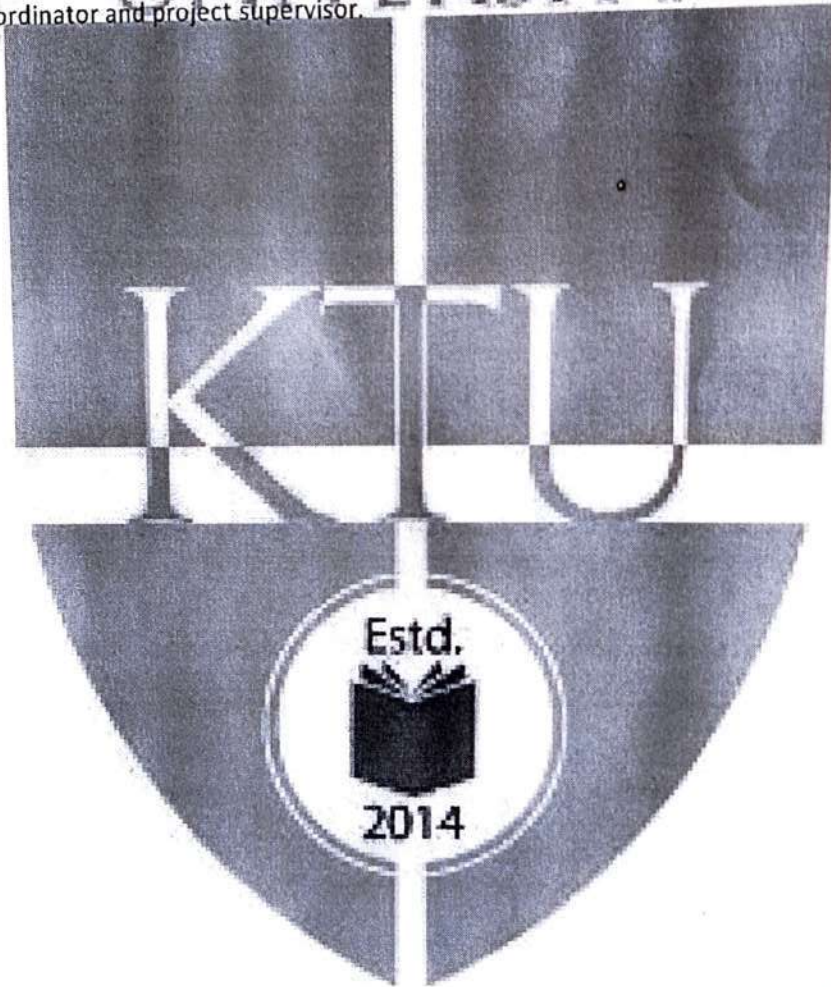
Guide :30

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.




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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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ELECTRICAL & ELECTRONICS ENGINEERING

(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	Course No.	Course Name Estd.	H O U R S	Course No.	Course Name	H O U R S
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 INSTRUMENTATI ON	4 4
S5	EET 381	SOLID STATE POWER CONVERSION	4 4	EET 383	SOLAR AND WINDENERGY 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 CONT ROL	4 4
S7	EED 481	MINIPROJECT	4 4	EED 481	MINIPROJECT	4 4	EED 481	MINIPROJECT	4 4


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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).



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- (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:

Semester	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 Estd.	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 292	NETWORK ANALYSIS AND SYNTHESIS	4	4	EET 292	NETWORK ANALYSIS AND SYNTHESIS	4	4
S5	EET393	DIGITAL SIMULATION	4	4	EET 393	DIGITAL SIMULATION	4	4	EET 393	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


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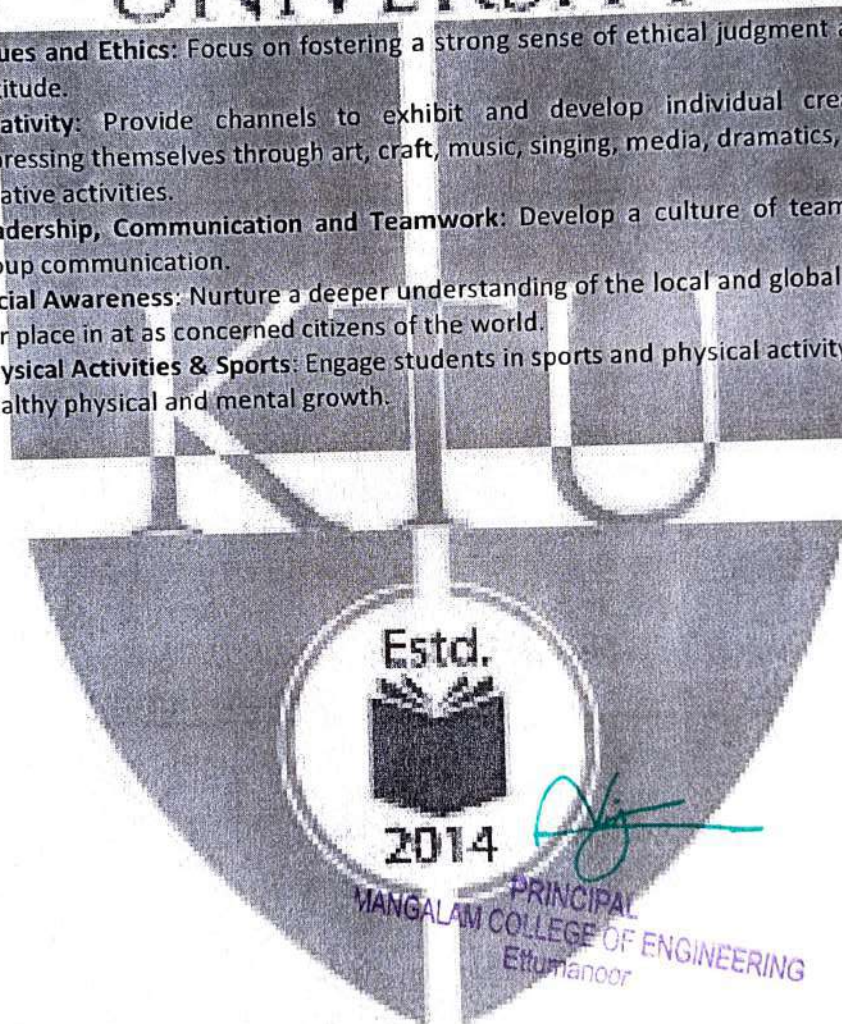
ELECTRICAL & ELECTRONICS ENGINEERING

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.



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


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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.


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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
1	Aeronautical Engg	AO	20	Food Technology	FT
2	Applied Electronics & Instrumentation	AE	21	Humanities	HU
3	Artificial Intelligence	AI	22	Industrial Engg	IE
4	Artificial Intelligence & Data Science	AD	23	Information Technology	IT
5	Automobile	AU	24	Instrumentation & Control	IC
6	Biomedical Engg	BM	25	Mandatory Courses	MC
7	Biotechnology	BT	26	Mathematics	MA
8	Chemical Engg	CH	27	Mechanical Engg	ME
9	Chemistry	CY	28	Mechatronics	MR
10	Civil Engg	CE	29	Metallurgy	MT
11	Computer Science	CS	30	Mechanical (Auto)	MU
12	Computer Science (Artificial Intelligence)	CA	31	Mechanical (Prod)	MP
13	Computer Science (Artificial Intelligence & Machine Learning)	CM	32	Naval & Ship Building	SB
14	Computer Science (Data Science)	CD	33	Physics	PH
15	Computer Science Cyber Security	CC	34	Polymer Engg	PO
16	Electronics & Biomedical	EB	35	Production Engg	PE
17	Electronics & Communication	EC	36	Robotics and Automation	RA
18	Electrical and Computer Engineering	EO	37	Safety & Fire Engg	FS
19	Electrical & Electronics	EE			

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	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

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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	PHT 110	ENGINEERING PHYSICS B	3-1-0	4	4
1/2	CYT 100	ENGINEERING CHEMISTRY	3-1-0	4	4
C	EST 100	ENGINEERING MECHANICS	2-1-0	3	3
1/2	EST 110	ENGINEERING GRAPHICS	2-0-2	4	3
D	EST 120	BASICS OF CIVIL & MECHANICAL ENGINEERING	4-0-0	4	4
1/2	EST 130	BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING	4-0-0	4	4
E	HUN 102	PROFESSIONAL COMMUNICATION	2-0-2	4	--
F	EST 102	PROGRAMMING IN C	2-1-2	5	4
S	PHL 120	ENGINEERING PHYSICS LAB	0-0-2	2	1
1/2	CYL 120	ENGINEERING CHEMISTRY LAB	0-0-2	2	1
T	ESL 120	CIVIL & MECHANICAL WORKSHOP	0-0-2	2	1
1/2	ESL 130	ELECTRICAL & ELECTRONICS WORKSHOP	0-0-2	2	1
TOTAL				28/29	21

NOTE:

- 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.
- 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.


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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:

- 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.


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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.


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SEMESTER VI

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	MET302	HEAT & MASS TRANSFER	3-1-0	4	4
B	MET304	DYNAMICS AND DESIGN OF MACHINERY	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

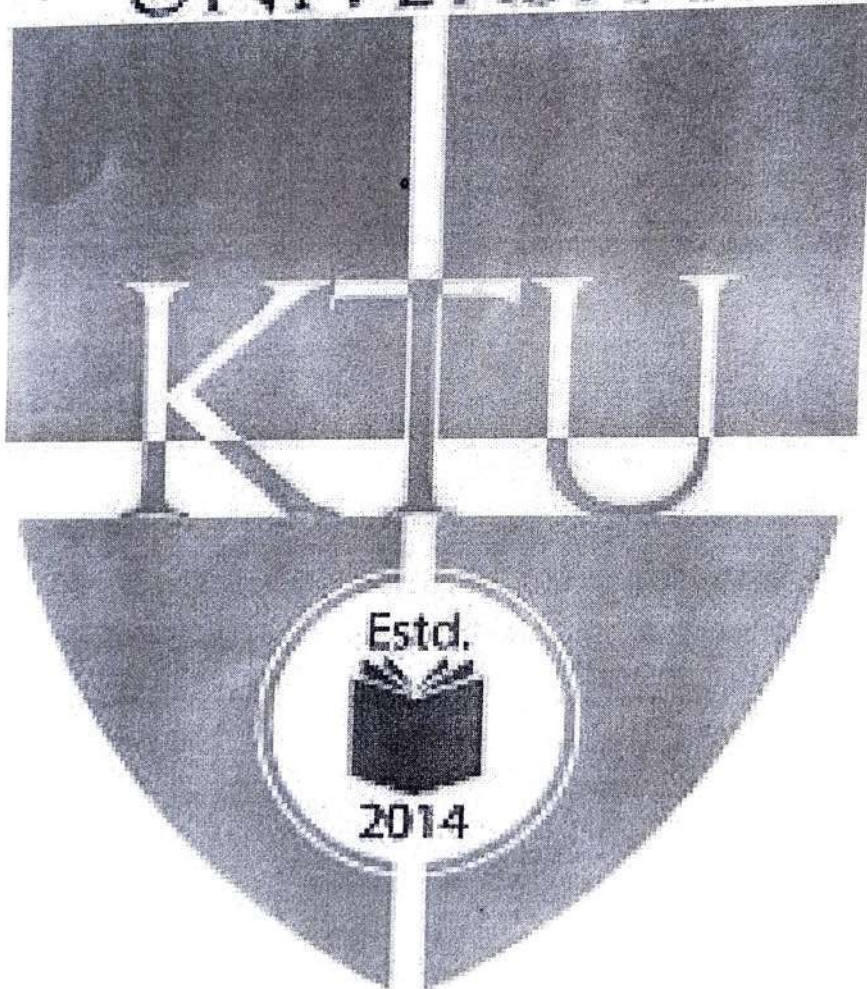
SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
D	MET312	NONDESTRUCTIVE TESTING	2-1-0	3	3
	MET322	COMPUTATIONAL FLUID DYNAMICS	2-1-0		
	MET332	ADVANCED MECHANICS OF SOLIDS	2-1-0		
	MET342	IC ENGINE COMBUSTION AND T POLLUTION	2-1-0		
	MET352	AUTOMOBILE ENGINEERING	2-1-0		
	MET362	PRODUCT DESIGN AND DEVELOPMENT	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.


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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.**




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MECHANICAL ENGINEERING

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.


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C	MET425	ANALYTICS QUANTITATIVE TECHNIQUES FOR ENGINEERS	2-1-0	3	3
	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/

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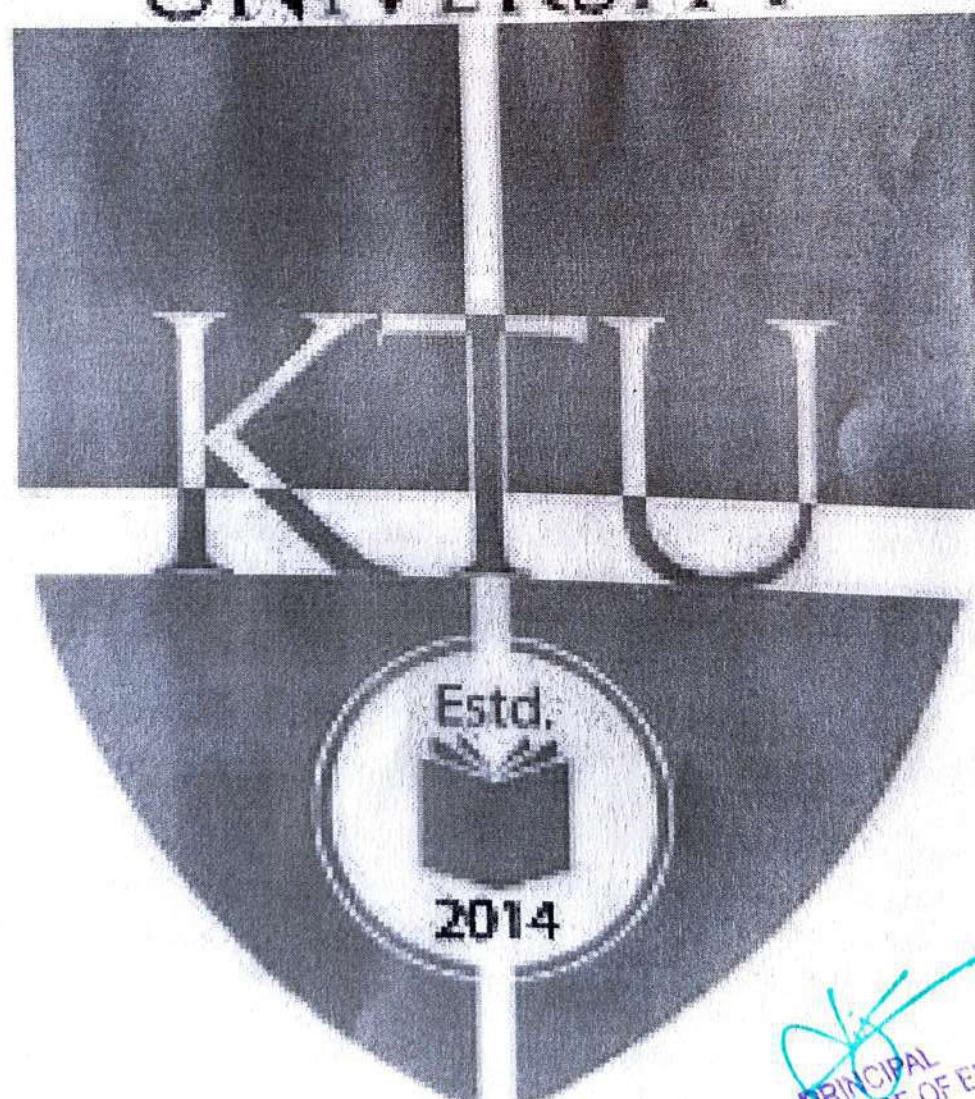
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- Feasibility;
- Preparing a Written Report on the Study conducted for presentation to the Department;
- Final Seminar, as oral Presentation before the evaluation committee.

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.




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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	DATA ANALYTICS FOR ENGINEERS	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	GASTURBINES 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 C O R S E N O. C R E D I T	Course No.	Course Name	H C O R S E N O. C R E D I T	Course No.	Course Name	H C O R S E N O. 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 SCIENCE AND 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 branch of 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

MECHANICAL ENGINEERING

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 5th Semester. 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
54	MET292	CONTINUUM MECHANICS	4	4	MET294	ADVANCED MECHANICS OF FLUIDS	4	4	MET296	MATERIALS IN MANUFACTURING	4	4
55	MET393	EXPERIMENT AL STRESS	4	4	MET395	ADVANCED THERMODYNA	4	4	MET397	FLUID POWER	4	4


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		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.

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APJ Abdul Kalam Technological University

Cluster 4: Kottayam

**M. Tech Program in
Electronics and Communication
Engineering
(Communication Engineering)**

Scheme of Instruction & Syllabus: 2015 Admissions



Compiled By

Rajiv Gandhi Institute of Technology, Kottayam

July 2015

A handwritten signature in blue ink, appearing to be 'Rajiv', is written over the stamp.

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MANGALAM COLLEGE OF TECHNOLOGY
Kottayam



APJ Abdul Kalam Technological University

Cluster 4: Kottayam

M. Tech Program Electronics and Communication Engineering
with specialization in Communication Engineering

Credit requirements :- 66 credits (21+19+14+12)
Normal Duration :- Regular: 4 semesters; External Registration: 6 semesters
Maximum duration :- Regular: 6 semesters; External registration : 7 semesters
Courses: Core Courses :- Either 4 or 3 credit courses; Elective courses: All of 3 credits

ELIGIBILITY: B. Tech / B.E in Electronics and Communication engineering, or allied branches with strong focus in electronics engineering.

SEMESTER-1

Exam Slot	Course Code	Name	L - T - P	Internal Marks	End Sem. Exam		Credits (22)
					Marks	hrs	
A	04 EC 6301	Analytical Foundation for Communication Engineering	4-0-0	40	60	3	4
B	04 EC 6303	Advanced Digital Communication Techniques	3-0-0	40	60	3	3
C	04 EC 6305	Algebraic Coding Theory	3-0-0	40	60	3	3
D	04 EC 6307	High Frequency Circuits Design	3-0-0	40	60	3	3
E	04 EC 63XX	Elective1	3-0-0	40	60	3	3
	04 GN 6001	Research Methodology	0-2-0	100	0	0	2
	04 EC 6391	Seminar	0-0-2	100	0	0	2
	04 EC 6393	Communication Engineering Lab I	0-0-2	100	0	0	1
TOTAL			22				21

APJ Abdul Kalam Technological University
Kottayam



SEMESTER-2

Exam Slot	Course No:	Name	L- T - P	Internal Marks	End Sem. Exam		Credits (19)
					Marks	hrs	
A	04 EC 6302	Advanced Communication Networks	4-0-0	40	60	3	4
B	04 EC 6304	Multicarrier and MIMO Communication Systems	3-0-0	40	60	3	3
C	04 EC 6306	Adaptive Signal Processing Techniques	3-0-0	40	60	3	3
D	04 EC 63XX	Elective-2	3-0-0	40	60	3	3
E	04 EC 63XX	Elective-3	3-0-0	40	60	3	3
	04 EC 6392	Mini Project	0-0-4	100	0	0	2
	04 EC 6394	Communication Engineering Lab 2	0-0-2	100	0	0	1
			22				19

SUMMER BREAK

Exam Slot	Course No:	Name	L- T - P	Internal Marks	End Sem. Exam		Credits (0)
					Marks	hrs	
	04 EC 7390	Industrial Training	0-0-4				Pass/ Fail

SEMESTER-3

Exam Slot	Course No:	Name	L- T - P	Internal Marks	End Sem. Exam		Credits (14)
					Marks	hrs	
A	04 EC 73XX	Elective 4	3-0-0	40	60	3	3
B	04 EC 73XX	Elective 5	3-0-0	40	60	3	3
	04 EC 7391	Seminar	0-0-2	100	0	0	2
	04 EC 7393	Project (Phase 1)	0-0-12	50	0	0	6



SEMESTER-4

Exam Slot	Course No:	Name	L- T - P	Internal Marks	External Evaluation	Credits (12)
					Marks	
	04 EC 7394	Project (Phase 2)	0-0-21	70	30	12

ELECTIVE LIST

ELECTIVE GROUP	EXAM SLOT	Course No:	Name
1	E	04 EC 6309	Advanced Optical Communication
	E	04 EC 6311	Signal Processing for Speech and Image
	E	04 EC 6313	Real Time Embedded System Design
	E	04 EC 6315	Antenna Theory and Design
2	D	04 EC 6308	Advanced Wireless & Mobile Communication system
	D	04 EC 6312	Modern Satellite Systems
	D	04 EC 6314	RF Microelectronics
	D	04 EC 6316	Multimedia compression techniques
3	E	04 EC 6318	Electromagnetic Compatibility and Interference
	E	04 EC 6322	Estimation and Detection
	E	04 EC 6324	Neural Networks and applications
	E	04 EC 6326	Computational Electromagnetic
4	A	04 EC 7301	Wireless ADHOC and Sensor Networks
	A	04 EC 7303	Communication Switching & Multiplexing
	A	04 EC 7305	Cloud Computing
	A	04 EC 7307	Microwave Integrated Circuits Design
5	B	04 EC 7309	Adaptive and smart antennas
	B	04 EC 7311	Communication Network Security
	B	04 EC 7313	Computer Vision
	B	04 EC 7315	Modern trends in communications

APJ Abdul Kalam Technological University

Cluster 4: Kottayam

M. Tech Program in Computer Science & Engineering

Scheme of Instruction and Syllabus: 2015 Admissions



Compiled By

Rajiv Gandhi Institute of Technology, Kottayam

July 2015

A handwritten signature in blue ink, appearing to be 'Rajiv', is written over the official stamp.

PRINCIPAL
RAJIV GANDHI INSTITUTE OF ENGINEERING
KOTTAYAM



APJ Abdul Kalam Technological University
(Kottayam Cluster)
M. Tech Program in Computer Science and Engineering
Scheme of Instruction

Credit requirements : 66 credits (22+18+14+12)
Normal Duration : Regular: 4 semesters; External Registration: 6 semesters
Maximum duration : Regular: 6 semesters; External Registration: 7 semesters
Courses: Core Courses: Either 4 or 3 credit courses; **Elective courses:** All of 3 credits
Allotment of credits and examination scheme:-

Semester 1 (Credits: 22)

Exam Slot	Course No:	Name	L- T - P	Internal Marks	End Semester Exam		Credits
					Marks	Duration (hrs)	
A	04 CS 6101	Computational Intelligence	3-1-0	40	60	3	4
B	04 CS 6103	Advanced Data Structures and Algorithms	3-1-0	40	60	3	4
C	04 CS 6105	Computer Security and Applied Cryptography	3-0-0	40	60	3	3
D	04 CS 6107	Modern Computer Networks	3-0-0	40	60	3	3
E	04 CS 6XXX*	Elective - I	3-0-0	40	60	3	3
	04 GN 6001	Research Methodology	0-2-0	100	0	0	2
	04 CS 6191	Seminar - I	0-0-2	100	0	0	2
	04 CS 6193	Network Simulation Lab	0-0-2	100	0	0	1
		Total	23				22

*See List of Electives-I for slot E

List of Elective - I Courses

Exam Slot	Course No.	Course Name
E	04 CS 6109	Web Services
E	04 CS 6111	Object Oriented Software Engineering
E	04 CS 6113	Logic in Computer Science
E	04 CS 6115	Social Network Analytics

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M. Tech Program in Computer Science and Engineering

Semester 2 (Credits: 18)

Exam Slot	Course No:	Name	L - T - P	Internal Marks	End Semester Exam		Credits
					Marks	Duration (hrs)	
A	04 CS 6102	Advanced Database Management	3-0-0	40	60	3	3
B	04 CS 6104	Automata Theory and Computability	3-0-0	40	60	3	3
C	04 CS 6106	High Performance Computer Architecture	3-0-0	40	60	3	3
D	04 CS 6XXX*	Elective 2	3-0-0	40	60	3	3
E	04 CS 6XXX^	Elective 3	3-0-0	40	60	3	3
	04 CS 6192	Mini Project	0-0-4	100	0	0	2
	04 CS 6194	Advanced Computing Lab	0-0-2	100	0	0	1
Total			21				18

*See List of Electives -II for slot D

^See List of Electives -III for slot E

List of Elective - II Courses

Exam Slot	Course Code	Course Name
D	04 CS 6108	Information Retrieval and Data Mining
D	04 CS 6112	VIRTUALIZING TECHNIQUES
D	04 CS 6114	Web Security
D	04 CS 6116	Agent Based Systems

List of Elective - III Courses

Exam Slot	Course Code	Course Name
E	04 CS 6118	Bioinformatics
E	04 CS 6122	Digital Image Processing
E	04 CS 6124	Operating System Design Concepts
E	04 CS 6126	Embedded Systems

Summer Break

Exam Slot	Course No:	Name	L - T - P	Internal Marks	End Semester Exam		Credits
					Marks	Duration (hrs)	
NA	04 CS 7190	Industrial Training	0-0-4	NA	NA	NA	Pass /Fail
Total			4				0

3 | APJ Abdul Kalam Technological University | Cluster 4 | M.Tech in Computer Science & Engg.

MANGALAM COLLEGE OF ENGINEERING
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M. Tech Program in Computer Science and Engineering

Semester 3 (Credits: 14)

Exam Slot	Course No:	Name	L- T - P	Internal Marks	End Semester Exam		Credits
					Marks	Duration (hrs)	
A	04 CS 7XXX*	Elective - IV	3-0-0	40	60	3	3
B	04 CS 7XXX^	Elective - V	3-0-0	40	60	3	3
	04 CS 7191	Seminar - II	0-0-2	100	0	0	2
	04 CS 7193	Project (Phase - I)	0-0-12	50	0	0	6
		Total	20				14

*See List of Electives-IV for slot A

^See List of Electives-V for slot B

List of Elective - IV Courses

Exam Slot	Course Code	Course Name
A	04 CS 7101	Cyber Forensics
A	04 CS 7103	Distributed Computing Systems
A	04 CS 7105	Wireless Sensor Networks
A	04 CS 7107	Text Mining and Language Processing

List of Elective - V Courses

Exam Slot	Course Code	Course Name
B	04 CS 7109	Big Data processing
B	04 CS 7111	Computer Vision
B	04 CS 7113	Compiler Design
B	04 CS 7115	Parallel Algorithms

Semester 4 (Credits: 12)

Exam Slot	Course No:	Name	L- T - P	Internal Marks	External Evaluation Marks		Credits
NA	04 CS 7194	Project (Phase -II)	0-0-21	70	30	NA	12
		Total	21				12

Total: 67

APJ Abdul Kalam Technological University

Cluster 4: Kottayam

**M. Tech Program in
Mechanical Engineering
(Industrial Engineering & Management)**

Scheme of Instruction and Syllabus: 2



Compiled By
Rajiv Gandhi Institute of Technology, Kottayam
July 2015

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APJ Abdul Kalam Technological University
(Kottayam Cluster)

M. Tech Program in Industrial Engineering and Management

Scheme

Credit requirements : 66 credits (22+18+14+12)
Normal Duration : Regular: 4 semesters; External Registration: 6 semesters;
Maximum duration : Regular: 6 semesters; External Registration: 7 semesters.
Courses: Core Courses: Either 4 or 3 credit courses; **Elective courses:** All of 3 credits
Allotment of credits and examination scheme:-

ELIGIBILITY: B. Tech/B.E in any branch of engineering with a minimum of 60 % Marks.

SEMESTER-1

Exam Slot	COURSE No.:	Name	L- T - P	Internal Marks	End Sem. Exam		Credits (22)
					Marks	Hrs	
A	04 ME 6101	Business Mathematics	3-1-0	40	60	3	4
B	04 ME 6103	Business Practice and Industrial Economics	3-1-0	40	60	3	4
C	04 ME 6105	Materials & Supply Chain Management	3-0-0	40	60	3	3
D	04 ME 6107	Work System Design	3-0-0	40	60	3	3
E	04 ME 61XX	Elective - I	3-0-0	40	60	3	3
	04 GN 6001	Research Methodology	0-2-0	100	0	0	2
	04 ME 6191	Seminar - I	0-0-2	100	0	0	2
	04 ME 6193	Industrial Engineering Lab	0-0-2	100	0	0	1
		Total	23				22

List of Elective –I Courses:

Exam Slot	Course No.	COURSE NAME
E	04 ME 6109	Marketing and Consumer Behaviour
E	04 ME 6111	Marketing Logistics
E	04 ME 6113	Safety and Environment Management System
E	04 ME 6115	Organizational Behaviour

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SEMESTER-2

Exam Slot	Course No:	Name	L- T - P	Internal Marks	End Sem. Exam		Credits (18)
					Marks	hrs	
A	04 ME 6102	Quantitative Techniques	3-0-0	40	60	3	3
B	04 ME 6104	Quality Management	3-0-0	40	60	3	3
C	04 ME 6106	Financial Management and Accounting	3-0-0	40	60	3	3
D	04 ME 61XX	Elective -II	3-0-0	40	60	3	3
E	04 ME 61XX	Elective -III	3-0-0	40	60	3	3
	04 ME 6192	Mini Project	0-0-4	100	0	0	2
	04 ME 6194	Software Lab	0-0-2	100	0	0	1
Total			21				18

List of Elective –II Courses

Exam Slot	COURSE No.	COURSE NAME
D	04 ME 6108	Soft Computing Techniques
D	04 ME 6112	Plant Engineering and Maintenance
D	04 ME 6114	Practical Project Management
D	04 ME 6116	Industrial Scheduling

List of Elective –III Courses

Exam Slot	COURSE No.	COURSE NAME
E	04 ME 6118	Reliability Engineering And Management
E	04 ME 6122	Business Communication and Report writing
E	04 ME 6124	Total Quality Management
E	04 ME 6126	Management Information System

SUMMER BREAK

Exam Slot	Course No:	Name	L- T - P	Internal Marks	End Sem. Exam		Credits (0)
					Marks	hrs	
NA	04 ME 7190	Industrial Training	0-0-4				Pass/ Fail

**SEMESTER-3**

Exam Slot	Course No:	Name	L- T - P	Internal Marks	End Sem. Exam		Credits (14)
					Marks	hrs	
A	04 ME 71XX	Elective 4	3-0-0	40	60	3	3
B	04 ME 71XX	Elective 5	3-0-0	40	60	3	3
NA	04 ME 7191	Seminar-II	0-0-2	100	0	0	2
NA	04 ME 7193	Project (Phase 1)	0-0-12*	50	0	0	6
Total			20				14

List of Elective-IV Courses:

Exam Slot	COURSE No.	COURSE NAME
A	04 ME 7101	System Modelling and Simulation
A	04 ME 7103	Modern Manufacturing System Design
A	04 ME 7105	Human Resource Management
A	04 ME 7107	Industrial Ergonomics

List of Elective-V Courses:

Exam Slot	COURSE No.	COURSE NAME
B	04 ME 7109	Knowledge Management
B	04 ME 7111	Industrial Relations
B	04 ME 7113	Integrated Materials Management
B	04 ME 7115	Heuristics of Decision Making

SEMESTER-4

Exam Slot	Course No:	Name	L- T - P	Internal Marks	External Evaluation	Credits (12)
					Marks	
NA	04 ME 7194	Project (Phase 2)	0-0-21	70	30	12

Total: 66 Credits

APJ Abdul Kalam Technological University

Cluster 4: Kottayam

**M. Tech Program in
Electrical Engineering
(Power Electronics & Power Systems)**

Scheme of Instruction and Syllabus : 2015 Admissions



Compiled By
Rajiv Gandhi Institute of Technology, Kottayam
July 2015

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APJ Abdul Kalam Technological University

(Kottayam Cluster)

M. Tech Program in Power Electronics and Power Systems

Scheme of Instruction

Credit requirements : 67 credits (22+19+14+12)

Normal Duration : Regular: 4 semesters; External Registration: 6 semesters;

Maximum duration : Regular: 6 semesters; External Registration: 7 semesters.

Courses: Core Courses: Either 4 or 3 credit courses; **Elective courses:** All of 3 credits

Allotment of credits and examination scheme:-

Semester 1 (Credits: 22)

Exam Slot	Course No:	Name	L- T - P	Internal Marks	End Semester Exam		Credits (22)
					Marks	Duration (hrs)	
A	04 EE 6001	Optimization Techniques for Engineering Applications	3-0-0	40	60	3	3
B	04 EE 6301	Power Electronic Devices & Circuits	4-0-0	40	60	3	4
C	04 EE 6403	Computer Applications in Power Systems	3-1-0	40	60	3	4
D	04 EE 6405	Power System Operation and Control	3-0-0	40	60	3	3
E	04 EE 6XXX*	Elective - I	3-0-0	40	60	3	3
	04 GN 6001	Research Methodology	0-2-0	100	0	0	2
	04 EE 6491	Seminar - I	0-0-2	100	0	0	2
	04 EE 6493	Power Systems Simulation Lab	0-0-2	100	0	0	1
		Total	23				22

*See List of Electives-I for slot E

List of Elective - I Courses

Exam Slot	Course No.	Course Name
E	04 EE 6103	System Theory
E	04 EE 6200	Electric Drive Systems
E	04 EE 6205	Modelling and Analysis of Electrical Machines
E	04 EE 6300	Advanced Power Semiconductor Devices

M. Tech (Power Electronics and Power Systems)



Semester 2 (Credits: 19)

Exam Slot	Course No:	Name	L- T - P	Internal Marks	End Semester Exam		Credits
					Marks	Duration (hrs)	
A	04 EE 6302	Switched Mode Power Converters	3-1-0	40	60	3	4
B	04 EE 6602	Embedded Controllers for Power Convertors	3-0-0	40	60	3	3
C	04 EE 6418	Power System Dynamics and Stability	3-0-0	40	60	3	3
D	04 EE 6XXX*	Elective - II	3-0-0	40	60	3	3
E	04 EE 6XXX^	Elective - III	3-0-0	40	60	3	3
	04 EE 6492	Mini Project	0-0-4	100	0	0	2
	04 EE 6390	Power Electronics Lab	0-0-2	100	0	0	1
		Total	22				19

*See List of Electives -II for slot D

^See List of Electives -III for slot E

List of Elective - II Courses

Exam Slot	Course Code	Course Name
D	04 EE 6002	Computational Intelligent Techniques
D	04 EE 6106	Stochastic Modelling and Applications
D	04 EE 6432	High Voltage DC Transmission
D	04 EE 6506	Energy Conservation and Management

List of Elective - III Courses

Exam Slot	Course Code	Course Name
E	04 EE 6118	Advanced Digital Signal Processing
E	04 EE 6212	Applications of Special Electrical Machines
E	04 EE 6308	Analysis, Design and Grid Integration of Photovoltaic Systems
E	04 EE 6444	FACTS and Power Quality



M. Tech (Power Electronics and Power Systems)

Summer Break

Exam Slot	Course No:	Name	L - T - P	Internal Marks	End Semester Exam		Credits
					Marks	Duration (hrs)	
NA	04 EE 7490	Industrial Training	0-0-4	NA	NA	NA	Pass /Fail
Total			4				0

Semester 3 (Credits: 14)

Exam Slot	Course No:	Name	L - T - P	Internal Marks	End Semester Exam		Credits
					Marks	Duration (hrs)	
A	04 EE 7XXX*	Elective - IV	3-0-0	40	60	3	3
B	04 EE 7XXX^	Elective - V	3-0-0	40	60	3	3
	04 EE 7491	Seminar - II	0-0-2	100	0	0	2
	04 EE 7493	Project (Phase - I)	0-0-12	50	0	0	6
Total			20				14

*See List of Electives-IV for slot A

^See List of Electives-V for slot B

List of Elective - IV Courses

Exam Slot	Course Code	Course Name
A	04 EE 7105	Robotics and Automation
A	04 EE 7303	Power Electronic Applications in Renewable Energy
A	04 EE 7409	Digital Protection of Power Systems
A	04 EE 7503	Renewable Energy Systems

List of Elective - V Courses

Exam Slot	Course Code	Course Name
B	04 EE 7113	Industrial Control Electronics
B	04 EE 7307	Numerical Simulation of Power Electronic Systems
B	04 EE 7421	Electricity Deregulation
B	04 EE 7603	Advanced Controllers for Embedded Systems



M. Tech (Power Electronics and Power Systems)

Semester 4 (Credits: 12)

Exam Slot	Course No:	Name	L - T - P	Internal Marks	External Evaluation Marks		Credits
NA	04 EE 7494	Project (Phase -II)	0-0-21	70	30	NA	12
		Total	21				12

Total: 67

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APJ Abdul Kalam Technological University

Cluster 4: Kottayam

M. Tech Program in Civil Engineering

(Structural Engineering & Construction Management)

Scheme of Instruction & Syllabus: 2015 Admissions



Compiled By

Rajiv Gandhi Institute of Technology, Kottayam

July 2015

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PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
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APJ Abdul Kalam Technological University
(Kottayam Cluster)

M. Tech Program in STRUCTURAL ENGINEERING AND CONSTRUCTION MANAGEMENT

Scheme

Credit requirements : 67 credits (22+19+14+12)
Normal Duration : Regular: 4 semesters; External Registration: 6 semesters;
Maximum duration : Regular: 6 semesters; External Registration: 7 semesters.
Courses: Core Courses: Either 4 or 3 credit courses; **Elective courses:** All of 3 credits
Allotment of credits and examination scheme:-

Semester 1 (Credits: 22)

Exam Slot	Course No:	Name	L- T - P	Internal Marks	End Semester Exam		Credits
					Marks	Duration (hrs)	
A	04 CE 6401	Analytical methods in Engineering	3-1-0	40	60	3	4
B	04 CE 6403	Theory of Elasticity	3-1-0	40	60	3	4
C	04 CE 6405	Construction Management	3-0-0	40	60	3	3
D	04 CE 6407	Advanced Design of Concrete Structures	3-0-0	40	60	3	3
E	04 CE 6XXX*	Elective - I	3-0-0	40	60	3	3
	04 GN 6001	Research Methodology	0-2-0	100	0	0	2
	04 CE 6491	Seminar - I	0-0-2	100	0	0	2
	04 CE 6493	Computer Application Lab	0-0-2	100	0	0	1
Total			23				22

*See List of Electives-I for slot E

List of Elective - I Courses

Exam Slot	Course No.	Course Name
E	04 CE 6409	Construction and Contracts Management
E	04 CE 6411	Structural Dynamics
E	04 CE 6413	Construction Planning, Scheduling and Control
E	04 CE 6415	Prestressed Concrete Structures





Semester 2 (Credits: 18)

Exam Slot	Course No:	Name	L- T - P	Internal Marks	End Semester Exam		Credits
					Marks	Duration (hrs)	
A	04 EC 6502	Analog Integrated Circuits	3-0-0	40	60	3	3
B	04 EC 6504	Advanced CMOS VLSI	3-0-0	40	60	3	3
C	04 EC 6506	Embedded Operating Systems & RTOS	3-0-0	40	60	3	3
D	04 EC 65XX	Elective - 2	3-0-0	40	60	3	3
E	04 EC 65XX	Elective - 3	3-0-0	40	60	3	3
	04 EC 6592	Mini Project	0-0-4	100	0	0	2
	04 EC 6594	Lab	0-0-2	100	0	0	1
		Total	21				18

* See List of Electives -II for slot D

^ See List of Electives -III for slot E

List of Elective - II Courses

Exam Slot	Course Code	Course Name
D	04 EC 6508	VLSI Testing
D	04 EC 6512	Introduction to MEMS
D	04 EC 6514	DSP Based System Design
D	04 EC 6516	Hardware Software Co- Design

List of Elective - III Courses

Exam Slot	Course Code	Course Name
E	04 EC 6518	VLSI Digital Signal Processing
E	04 EC 6522	Reconfigurable Computing
E	04 EC 6524	Embedded Control Systems
E	04 EC 6526	Electronic Packaging

Summer Break

Exam Slot	Course No:	Name	L- T - P	Internal Marks	End Semester Exam		Credits
					Marks	Duration (hrs)	
NA	04 EC 7590	Industrial Training	0-0-4	NA	NA	NA	Pass /Fail
		Total	4				0

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**Semester 3 (Credits: 14)**

Exam Slot	Course No:	Name	L- T - P	Internal Marks	End Semester Exam		Credits
					Marks	Duration (hrs)	
A	04 EC 75XX	Elective - 4	3-0-0	40	60	3	3
B	04 EC 75XX	Elective - 5	3-0-0	40	60	3	3
	04 EC 7591	Seminar II	0-0-2	100	0	0	2
	04 EC 7593	Project (Phase 1)	0-0-12	50	0	0	6
Total			20				14

*See List of Electives-IV for slot A

^See List of Electives-V for slot B

List of Elective - IV Courses

Exam Slot	Course Code	Course Name
A	04 EC 7501	Mixed VLSI Circuits Design
A	04 EC 7503	System On Chip
A	04 EC 7505	Computer Architecture And Parallel Processing
A	04 EC 7507	Electronic System Design

List of Elective - V Courses

Exam Slot	Course Code	Course Name
B	04 EC 7509	High speed Digital Design
B	04 EC 7511	NANO Devices and Circuits
B	04 EC 7513	Power Management of Embedded Systems
B	04 EC 7515	VLSI For Wireless Communication

Semester 4 (Credits: 12)

Exam Slot	Course No:	Name	L- T - P	Internal Marks	External Evaluation Marks		Credits
NA	04 EC 7594	Project (Phase -II)	0-0-21	70	30	NA	12
Total			21				12

Total: 65

APJ Abdul Kalam Technological University

Cluster 4: Kottayam

M. Tech Program in
Electronics & Communication
Engineering
(VLSI & Embedded Systems)

Scheme of Instruction & Syllabus: 2015 Admissions



Compiled By

Rajiv Gandhi Institute of Technology, Kottayam

July 2015

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APJ Abdul Kalam Technological University

(Kottayam Cluster)

M. Tech in Electronics and Communication Engineering (VLSI and Embedded Systems)

Scheme

Credit requirements : 65 credits (21+18+14+12)
Normal Duration : Regular: 4 semesters; External Registration: 6 semesters;
Maximum duration : Regular: 6 semesters; External Registration: 7 semesters.
Courses: Core Courses: Either 4 or 3 credit courses; **Elective courses:** All of 3 credits

ELIGIBILITY: B.Tech / B.E in Electronics and Communication engineering, or allied branches with strong focus in electronics engineering/Biomedical Engineering.

Allotment of credits and examination scheme:-

Semester 1 (Credits:21)

Exam Slot	Course No:	Name	L- T - P	Internal Marks	End Semester Exam		Credits
					Marks	Duration (hrs)	
A	04EC6501	VLSI Technology	4-0-0	40	60	3	4
B	04EC6503	Advanced Digital Design	3-0-0	40	60	3	3
C	04EC6505	CMOS VLSI Design	3-0-0	40	60	3	3
D	04EC6507	Design with ARM Microcontrollers	3-0-0	40	60	3	3
E	04EC65XX	Elective-1	3-0-0	40	60	3	3
	04GN6001	Research Methodology	0-2-0	100	0	0	2
	04EC6591	Seminar	0-0-2	100	0	0	2
	04EC6593	Lab	0-0-2	100	0	0	1
		Total	22				21

*See List of Electives-I for slot E

List of Elective - I Courses

Exam Slot	Course No.	Course Name
E	04 EC 6509	ASIC & FPGA
E	04 EC 6511	VLSI Design Automation
E	04 EC 6513	Embedded Network Controllers
E	04 EC 6515	Embedded Software Design



Exam Slot	Course No:	Name	L - T - P	Internal Marks	End Semester Exam		Credits
					Marks	Duration (hrs)	
A	04 CE 7XXX*	Elective - IV	3-0-0	40	60	3	3
B	04 CE 7XXX^	Elective - V	3-0-0	40	60	3	3
	04 CE 7491	Seminar - II	0-0-2	100	0	0	2
	04 CE 7493	Project (Phase - I)	0-0-12	50	0	0	6
Total			20				14

*See List of Electives-IV for slot A

^See List of Electives-V for slot B

List of Elective - IV Courses

Exam Slot	Course Code	Course Name
A	04 CE 7401	Design of Steel – Concrete Composite Structures
A	04 CE 7403	Design of Bridges
A	04 CE 7405	Construction Economics and Finance
A	04 CE 7407	Design of Tall Buildings

List of Elective - V Courses

Exam Slot	Course Code	Course Name
B	04 CE 7409	Design of Cylindrical shell and Folded Plates
B	04 CE 7411	Construction Project Management
B	04 CE 7413	Maintenance & Rehabilitation of Structures
B	04 CE 7415	Construction Personnel Management

Semester 4 (Credits: 12)

Exam Slot	Course No:	Name	L - T - P	Internal Marks	External Evaluation Marks		Credits
NA	04 CE 7494	Project (Phase -II)	0-0-21	70	30	NA	12
Total			21				12

Total: 67

APJABDUL KALAM TECHNOLOGICAL UNIVERSITY
MBA Course Structure 2017 (Full Time)

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	0-1-0	20			
	18	Project	0-0-9				
		TOTAL	18-2-9	260	360		18

TRIMESTER II

Exam Slot	Course No.	Course Name	L-T-P	Internal Marks	End Trimester Marks	Exam Duration (hours)	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

TRIMESTER III

Exam Slot	Course No.	Course Name	L-T-P	Internal Marks	End Trimester Marks	Exam Duration (hours)	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 System	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


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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

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

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

CREDITS AND MARKS

Total credits	115
Internal marks	1620
University marks	2140
Total marks	3760


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Sl.No.	Code	HR Electives	Trimester
1	HR-T4-1	Training and Development	T4
2	HR-T4-2	Organizational Change and Development	T4
3	HR-T4-3	Industrial Relations and Labour Law	T4
4	HR-T4-4	Managing self and others	T4
5	HR-T4-5	Talent Sourcing and acquisition	T4
6	HR-T4-6	Industrial Psychology	T4
7	HR-T5-7	Performance Management	T5
8	HR-T5-8	Compensation Management	T5
9	HR-T5-9	Leadership, Power and Influence	T5
10	HR-T5-10	Negotiation and Conflict Resolution	T5
11	HR-T5-11	HRM: Policy and Strategy	T5
12	HR-T5-12	Global HRM	T5
13	HR-T6-13	Management of Creativity	T6
14	HR-T6-14	HR Analytics	T6
15	HR-T6-15	HR Consulting: Profession and Practice	T6

Sl. No.	Code	Finance Electives	Trimester
1	FIN-T4-1	Financial Markets and Services	T4
2	FIN-T4-2	Project Finance	T4
3	FIN-T4-3	Financial Risk Management	T4
4	FIN-T4-4	Commercial Banking System	T4
5	FIN-T4-5	Investment Management	T4
6	FIN-T4-6	Financial Statement Analysis	T4
7	FIN-T5-7	Behavioural Finance	T5
8	FIN-T5-8	Security Analysis and Portfolio Management	T5
9	FIN-T5-9	Corporate Taxation	T5
10	FIN-T5-10	International Finance	T5
11	FIN-T5-11	NBFCs and Microfinance	T5
12	FIN-T5-12	Cost Accounting and Budget Control	T5
13	FIN-T6-13	Strategic Financial Management	T6
14	FIN-T6-14	Financial Derivatives	T6
15	FIN-T6-15	Insurance Management	T6

Sl. No.	Code	Marketing Electives	Trimester
1	MKT-T4-1	Rural Marketing	T4


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2	MKT-T4-2	Consumer Behaviour	T4
3	MKT-T4-3	Social Marketing	T4
4	MKT-T4-4	Services Marketing	T4
5	MKT-T4-5	Marketing Research	T4
6	MKT-T4-6	Sales and Distribution Management	T4
7	MKT-T5-7	International Marketing	T5
8	MKT-T5-8	Brand Management	T5
9	MKT-T5-9	Retail Management	T5
10	MKT-T5-10	Integrated Marketing Communications	T5
11	MKT-T5-11	Customer Relationship Management	T5
12	MKT-T5-12	Digital and Social Media Marketing	T5
13	MKT-T6-13	Customer Analytics	T6
14	MKT-T6-14	B2B Marketing	T6
15	MKT-T6-15	Strategic Marketing	T6

Sl. No.	Code	Operations Electives	Trimester
1	OM-T4-1	Supply Chain and Logistics Management	T4
2	OM-T4-2	Facilities and Location Management	T4
3	OM-T4-3	Quality Management	T4
4	OM-T4-4	Business Process Reengineering	T4
5	OM-T4-5	World Class Manufacturing	T4
6	OM-T4-6	Logistics and Materials Handling	T4
7	OM-T5-7	Healthcare Management	T5
8	OM-T5-8	Services Operations Management	T5
9	OM-T5-9	Technology Management	T5
10	OM-T5-10	Innovation Management and New Product Development	T5
11	OM-T5-11	Green Logistics and Supply Chain Management	T5
12	OM-T5-12	Six Sigma and TQM	T5
13	OM-T6-14	Advanced Project Management	T6
14	OM-T6-15	Advanced Maintenance Management	T6
15	OM-T6-16	Business Sustainability	T6

Sl. No.	Code	Systems Electives	Trimester
1	SYS-T4-1	System Analysis and Design	T4
2	SYS-T4-2	Software Engineering	T4
3	SYS-T4-3	ERP	T4
4	SYS-T4-4	e-Business	T4



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5	SYS-T4-5	e-Governance	T4
6	SYS-T4-6	Business Database System	T4
7	SYS-T5-7	Software Project Management	T5
8	SYS-T5-8	Knowledge Management in IT and ITES	T5
9	SYS-T5-9	Business Intelligence and Data warehousing	T5
10	SYS-T5-10	Simulation for Managers	T5
11	SYS-T5-11	Global Information System	T5
12	SYS-T5-12	Cloud Computing	T5
13	SYS-T6-13	Business Datamining	T6
14	SYS-T6-14	Big data Analytics in Business	T6
15	SYS-T6-15	Information Security and Risk Management	T6



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MANJALAH COLLEGE OF ENGINEERING

CURRICULUM FOR MBA, 2020

SEMESTER I

Exam Slot	Course No.	Course Name	L-T-P	Internal Marks	End Semester Marks	Exam Duration (hours)	Credits
A	20MBA101	Introduction to Business	3-0-0	40	60	3	3
B	20MBA103	Quantitative Techniques for Managers	4-0-0	40	60	3	4
C	20MBA105	Organizational Behaviour	3-0-0	40	60	3	3
D	20MBA107	Business Economics	4-0-0	40	60	3	4
E	20MBA109	Information Systems for Managers	3-0-0	40	60	3	3
F	20MBA111	Accounting for Managers	4-0-0	40	60	3	4
G	20MBA113	Ethics, Governance and Corporate Responsibility	3-0-0	40	60	3	3
H	20MBA115	Legal Systems for Business	3-0-0	40	60	3	3
	20MBANC1	Employability Enhancement Programme	0-0-2				
		TOTAL	27-0-2	360	480		27

SEMESTER II

Exam Slot	Course No.	Course Name	L-T-P	Internal Marks	End Semester Marks	Exam Duration (hours)	Credits
A	20MBA102	Marketing Management	4-0-0	40	60	3	4
B	20MBA104	Financial Management	4-0-0	40	60	3	4
C	20MBA106	Human Resource Management	3-0-0	40	60	3	3
D	20MBA108	Operations Management	3-0-0	40	60	3	3
E	20MBA110	Operations Research	4-0-0	40	60	3	4


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F	20MBA112	Research for Managerial Decisions	3-0-0	40	60	3	3
G	20MBA114	Entrepreneurship Development	3-0-0	40	60	3	3
	20MBANC2	Integrated Disaster Management	1-0-1				
		TOTAL	25-0-1	360	480		24

MBA SUMMER INTERNSHIP OUTSIDE THE COLLEGE (6 WEEKS to 8 WEEKS)

SEMESTER III

Exam Slot	Course No.	Course Name	L-T-P	Internal Marks	End Semester Marks	Exam Duration (hours)	Credits
A	20MBA201	International Business	4-0-0	40	60	3	4
B	20MBA203	Business Analytics	4-0-0	40	60	3	4
C	20MBA---	Elective I	3-0-0	40	60	3	3
D	20MBA---	Elective II	3-0-0	40	60	3	3
E	20MBA---	Elective III	3-0-0	40	60	3	3
F	20MBA---	Elective IV	3-0-0	40	60	3	3
G	20MBA---	Elective V	3-0-0	40	60	3	3
	20MBA351	Internship	0-0-6	40	60		3
		TOTAL	23-0-6	380	420		26


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SEMESTER IV

Exam Slot	Course No.	Course Name	L-T-P	Internal Marks	End Semester Marks	Exam Duration (hours)	Credits
A	20MBA202	Strategic Management	4-0-0	40	60	3	4
B	20MBA204	Industry 4.0 and AI applications for Business	4-0-0	40	60	3	4
C	20MBA---	Elective VI	3-0-0	40	60	3	3
D	20MBA---	Elective VII	3-0-0	40	60	3	3
E	20MBA---	Elective VIII	3-0-0	40	60	3	3
	20MBA352	Project & Comprehensive Viva Voce	0-0-10	100	100	3	5
	20MMOOC	Any PG Management Course of 3 Credits of NPTEL/SWAYAM	0-0-3				3
		TOTAL		350	370		25
		G.TOTAL		1450	1750		102

3. LIST OF ELECTIVES

Course No.	HR Electives	Semester	Exam Slot
20MBA211	Dynamics of Training and Executing Development	S3	C
20MBA213	Discovery of Self & Others	S3	C
20MBA215	Organizational Change and Development	S3	D




20MBA217	HRM Polices & Strategies	S3	D
20MBA219	Industrial Relations and Labour Law	S3	E
20MBA221	Global HRM	S3	E
20MBA223	Human Resource Analytics	S3	F
20MBA225	Leadership, Influence & Power	S3	F
20MBA227	Reward Management	S3	G
20MBA229	Negotiations & Conflict Resolutions	S3	G
20MBA212	Performance Management	S4	C
20MBA214	Management of Creativity & Innovation	S4	C
20MBA216	Team Dynamics & Cross Cultural Management	S4	D
20MBA218	Industrial Psychology	S4	D
20MBA220	HR Consulting: Profession and Practice	S4	E
20MBA222	Talent Source & Acquisitions	S4	E

Course No.	Finance Electives	Semester	Exam Slot
20MBA231	Financial Markets and Services	S3	C

20MBA233	Project Finance	53	C
20MBA235	Cost Accounting and Budget Control	53	D
20MBA237	Security Analysis and Portfolio Management	53	D
20MBA239	Managing Banks and Financial Institutions	53	E
20MBA241	Entrepreneurial Finance	53	E
20MBA243	International Finance	53	F
20MBA245	Statistics Methods for Financial Analytics	53	F
20MBA247	Financial Technologies	53	G
20MBA249	NBFCs & Micro Finance	53	G
20MBA232	Financial Information Analysis	54	C
20MBA234	Financial Derivatives	54	C
20MBA236	Financial Risk Management	54	D
20MBA238	Strategic Financial management	54	D
20MBA240	Insurance Management	54	E
20MBA242	Financial Applications for Machine Learning	54	E

Course No.	Marketing Electives	Semester	Exam Slots
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 DEPARTMENT OF FINANCIAL ENGINEERING
 2024-25

20MBA251	Strategic Marketing Intelligence	S3	C
20MBA253	B2B Marketing	S3	C
20MBA255	Consumer Behaviour	S3	D
20MBA257	Services Marketing	S3	D
20MBA259	Integrated Marketing Communications	S3	E
20MBA261	Marketing Research	S3	E
20MBA263	Retail Management	S3	F
20MBA265	Sales & Distribution Management	S3	F
20MBA267	Brand Management	S3	G
20MBA269	Hospitality and Tourism Marketing	S3	G
20MBA252	Social Marketing	S4	C
20MBA254	Customer Relationship Management	S4	C
20MBA256	Rural Marketing	S4	D
20MBA258	Strategic Marketing	S4	D
20MBA260	International Marketing	S4	E
20MBA262	Digital and Social Media Marketing	S4	E


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Course No.	Operation Electives	Semester	Exam Slot
20MBA271	Supply Chain Management	S3	C
20MBA273	Facilities & Location Management	S3	C
20MBA275	Quality Management	S3	D
20MBA277	Six Sigma & TQM	S3	D
20MBA279	Business Process Reengineering	S3	E
20MBA281	Services & Operations Management	S3	E
20MBA283	Healthcare Management	S3	F
20MBA285	Decision Analysis for Management	S3	F
20MBA287	Advanced Maintenance Management	S3	G
20MBA289	Advanced Project Management	S3	G
20MBA272	Technology Application and IPR	S4	C
20MBA274	Innovation and New Product Management	S4	C
20MBA276	Business Planning for Small & Medium Enterprises	S4	D
20MBA278	Managing Public Private Partnerships	S4	D


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20MBA280	New Business Models	S4	E
20MBA282	World Class Manufacturing	S4	E

Course No.	System Electives	Semester	Exam Slot
20MBA291	System Analysis and Design	S3	C
20MBA293	Global Information System	S3	C
20MBA295	Business Database System	S3	D
20MBA297	Knowledge Management and IT/ ITES Consulting	S3	D
20MBA299	Information Security and Risk Management	S3	E
20MBA301	Business Intelligence and Data warehousing	S3	E
20MBA303	e-Business	S3	F
20MBA305	AI Strategies for Business	S3	F
20MBA307	e-Governance	S3	G
20MBA309	Simulation for Managers	S3	G
20MBA292	Business Data Mining	S4	C
20MBA294	Software Project Management	S4	C

20MBA296	Enterprise Resource Planning	S4	D
20MBA298	Cloud Computing & Cyber Security	S4	D
20MBA302	Enterprise Management in Digital era	S4	E
20MBA304	Software Engineering	S4	E

Course No.	General Electives	Semester	Exam Slot
20MBA311	Managing Employee Satisfaction	S3	C
20MBA313	Econometrics	S3	D
20MBA315	Design Thinking	S3	E
20MBA317	Social Entrepreneurship	S3	F
20MBA319	Tourism Management	S3	G
20MBA321	Hospitality management	S3	C
20MBA312	Management of NGOs	S4	C
20MBA314	Management of Sustainable Business	S4	D
20MBA316	Family Business	S4	E
20MBA318	Managing Contracts	S4	C

CERTIFICATE

This is to certify that

ADITHYA A NAIR

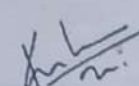
student of

MANGALAM COLLEGE OF ENGINEERING

has completed 5 days internship training in ROBOTICS from 2nd JANUARY 2020 at TORC INFOTECH, Kochi. During this intern period, we found him/her a sincere, honest, hardworking, dedicated student with a professional attitude and very good professional knowledge.

We wish you every success in all future endeavours.

Date : 7 JANUARY 2020


Director
TORC INFOTECH



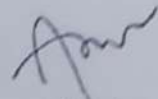

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CERTIFICATE

This is to certify that
ASHIK DAS TH
Student of
MANGALAM COLLEGE OF ENGINEERING ETTUMANOOR

Has completed 5 days internship training in ANDROID APP DEVELOPMENT from 2nd June 2021 at Techone Technologies Pvt.Ltd, Wayanad. During this intern period, we found him/her a sincere, honest, hardworking, dedicated student with a professional attitude along with a very good professional knowledge.
We wish you every success in all future endeavours.

Date: 14-06-2021



Director
TECHONE TECHNOLOGIES PVT. LTD.

CIN:U72900KL2019PTC058909

techonetechnologies@gmail.com


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CERTIFICATE

This is to certify that
Dacena C Martin
Student of
Mangalam College of Engineering, Ettumanoor

Has completed 5 days internship training in ANDROID APP DEVELOPMENT from 2nd june 2021 at Techone Technologies Pvt Ltd
Wayanad. During this intern period, we found him/her a sincere, honest, hardworking, dedicated student with a professional
attitude along with a very good professional knowledge.
We wish you every success in all future endeavours.


Date: 14-06-2021




Director
TECHONE TECHNOLOGIES PVT. LTD

CTN 1772900612019PTC000909

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MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

ITBG - Knowledge Services Group

GSTIN : 32AABCK1319E4Z5

Phone: 0471-2724765 || Helpline No: +91 9188665545 || E-mail: iteg@keltron.org || Website Link : ksg.keltron.in

KSG/60/INTP/20-01/L4258

17.01.2020

CERTIFICATE

Certified that the Student has completed the Internship Program conducted at KELTRON as per the particulars given below:

Name of the Student	Mr. ABIJITH BIJU
Name & Address of the College/Institution at which the Student is Studying	Mangalam College of Engineering, Ettumanoor, Kottayam, Kerala - 686631
University/Board, which the Institution is Affiliated to	A P J Abdul Kalam Technological University (KTU), Kerala
Branch/Discipline of Study	B. Tech in Computer Science & Engineering
Student's Registration No.	MLM19CS005
Semester / Year of Study	1 st Semester
Name & Address of the Institution/Centre where the Internship Program was conducted	Keltron Knowledge Centre (60), Pulickakandathil Building, P.P Road, Pala - 686575, Kerala
Online Portal Registration No.	KI010458
Roll No./Register No.	K19601110155
Program Category	INTERNSHIP
Period & Duration of the Program	03.01.2020 to 09.01.2020 (1 Week)
Area of Exposure	Programming Fundamentals, Control Statements, Arrays, Strings, Functions, Structure
Status	COMPLETED SUCCESSFULLY



Authorized Signatory
(Knowledge Services)

Head of Centre
Keltron Knowledge Centre
Municipal Shopping Complex

Regd. Office: Keltron House, Vellayambalam, Thiruvananthapuram, Kerala State, India. Pin: 695 033, Tel: 0471-4094444

Doc. No : KSG/LH/07-19/007(5000)

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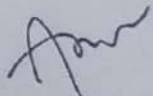
CERTIFICATE

This is to certify that
Adithya A Nair
Student of
MANGALAM COLLEGE OF ENGINEERING

Has completed 5 days internship training in ANDROID APP DEVELOPMENT from 2nd june 2021 at Techone Technologies Pvt.Ltd, Wayanad. During this intern period, we found him/her a sincere, honest, hardworking, dedicated student with a professional attitude along with a very good professional knowledge.
We wish you every success in all future endeavours.

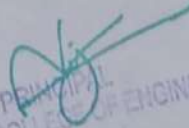
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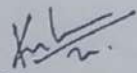
CHANDRALEKHA.J
student of

MANGALAM COLLEGE OF ENGINEERING


has completed 5 days internship training in ROBOTICS from 2nd JANUARY 2020 at TORC INFOTECH, Kochi. During this intern period, we found him/her a sincere, honest, hardworking, dedicated student with a professional attitude and very good professional knowledge.

We wish you every success in all future endeavours.

Date : 7 JANUARY 2020


Director
TORC INFOTECH




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ASHIK DAS TH
Student of
MANGALAM COLLEGE OF ENGINEERING ETTUMANOOR

Has completed 5 days internship training in ANDROID APP DEVELOPMENT from 2nd june 2021 at Techone Technologies Pvt.Ltd, Wayanad. During this intern period, we found him/her a sincere, honest, hardworking, dedicated student with a professional attitude along with a very good professional knowledge.
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Date: 14-06-2021




Director
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KSG/60/INTP/20-01/L4259

17.01.2020

CERTIFICATE

Certified that the Student has completed the Internship Program conducted at KELTRON as per the particulars given below:

Name of the Student	Mr. AMAL MOHANAN
Name & Address of the College/Institution at which the Student is Studying	Mangalam College of Engineering, Ettumanoor, Kottayam, Kerala - 686631
University/Board, which the Institution is Affiliated to	A P J Abdul Kalam Technological University (KTU), Kerala
Branch/Discipline of Study	B. Tech in Computer Science & Engineering
Student's Registration No.	MLM19CS022
Semester / Year of Study	1 st Semester
Name & Address of the Institution/Centre where the Internship Program was conducted	Keltron Knowledge Centre (60), Pulickakandathil Building, P.P Road, Pala - 686575, Kerala
Online Portal Registration No.	KI010466
Roll No./Register No.	K1960I110156
Program Category	INTERNSHIP
Period & Duration of the Program	06.01.2020 to 12.01.2020 (1 Week)
Area of Exposure	Programming Fundamentals, Control Statements, Arrays, Strings, Functions, Structure
Status	COMPLETED SUCCESSFULLY



Authorized Signatory
(Knowledge Services)



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Ettumanoor

Head of Centre
Keltron Knowledge Centre
Municipal Shopping Complex

Regd. Office: Keltron, Muttam, Valayambalam, Thiruvananthapuram, Kerala State, India. Pin:695 033, Tel: 0471-4094444

Temp No: KSG/INTP/20-01/L4259

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Has completed 5 days internship training in ANDROID APP DEVELOPMENT from 2nd june 2021 at Techone Technologies Pvt.Ltd, Wayanad. During this intern period, we found him/her a sincere, honest, hardworking, dedicated student with a professional attitude along with a very good professional knowledge.
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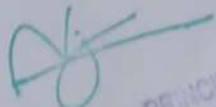
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17.01.2020

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Name of the Student	Ms. ANAHA BABU
Name & Address of the College/Institution at which the Student is Studying	Mangalam College of Engineering, Ettumanoor, Kottayam, Kerala - 686631
University/Board, which the Institution is Affiliated to	A P J Abdul Kalam Technological University (KTU), Kerala
Branch/Discipline of Study	B. Tech in Computer Science & Engineering
Student's Registration No.	MLM19CS023
Semester / Year of Study	1 st Semester
Name & Address of the Institution/Centre where the Internship Program was conducted	Keltron Knowledge Centre (60), Pulickakandathil Building, P.P Road, Pala - 686575, Kerala
Online Portal Registration No.	KI010467
Roll No./Register No.	K1960I110157
Program Category	INTERNSHIP
Period & Duration of the Program	06.01.2020 to 12.01.2020 (1 Week)
Area of Exposure	Programming Fundamentals, Control Statements, Arrays, Strings, Functions, Structure
Status	COMPLETED SUCCESSFULLY


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Keltron Knowledge Centre
Municipal Shopping Complex
Regd. Office - Keltron Kollam, Vellayambalam, Thiruvananthapuram, Kerala State, India. Pin: 695 033, Tel: 0471-4094444
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ASHIK DAS TH

Student of

MANGALAM COLLEGE OF ENGINEERING ETTUMANOOR

Has completed 5 days internship training in ANDROID APP DEVELOPMENT from 2nd June 2021 at Techone Technologies Pvt.Ltd, Wayanad. During this intern period, we found him/her a sincere, honest, hardworking, dedicated student with a professional attitude along with a very good professional knowledge. We wish you every success in all future endeavours.

Date: 14-06-2021



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17.01.2020

CERTIFICATE

Certified that the Student has completed the Internship Program conducted at KELTRON as per the particulars given below:

Name of the Student	Mr. ALEN JOHNY
Name & Address of the College/Institution at which the Student is Studying	Mangalam College of Engineering, Ettumanoor, Kottayam, Kerala - 686631
University/Board, which the Institution is Affiliated to	A P J Abdul Kalam Technological University (KTU), Kerala
Branch/Discipline of Study	B. Tech in Computer Science & Engineering
Student's Registration No.	MLM19CS019
Semester / Year of Study	1 st Semester
Name & Address of the Institution/Centre where the Internship Program was conducted	Keltron Knowledge Centre (60), Pulickakandathil Building, P.P Road, Pala - 686575, Kerala
Online Portal Registration No.	KI010469
Roll No./Register No.	K1960I110159
Program Category	INTERNSHIP
Period & Duration of the Program	06.01.2020 to 12.01.2020 (1 Week)
Area of Exposure	Programming Fundamentals, Control Statements, Arrays, Strings, Functions, Structure
Status	COMPLETED SUCCESSFULLY



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Head of Centre
Keltron Knowledge Centre
Municipal Shopping Complex
Nagampadam, Kottayam-686 001

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ARSHAD ABOOBAKER

Student of

MANGALAM COLLEGE OF ENGINEERING ETTUMANOOR, KOTTAYAM

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Date: 14-06-2021



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Ettumanoor


KSG/60/INTP/20-01/L4257

17.01.2020

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Name of the Student	Ms. ANANTHALAKSHMI R
Name & Address of the College/Institution at which the Student is Studying	Mangalam College of Engineering, Ettumanoor, Kottayam, Kerala - 686631
University/Board, which the Institution is Affiliated to	A P J Abdul Kalam Technological University (KTU), Kerala
Branch/Discipline of Study	B. Tech in Computer Science & Engineering
Student's Registration No.	MLM19CS024
Semester / Year of Study	1 st Semester
Name & Address of the Institution/Centre where the Internship Program was conducted	Keltron Knowledge Centre (60), Pulickakandathil Building, P.P Road, Pala - 686575, Kerala
Online Portal Registration No.	KI010456
Roll No./Register No.	K1960I110154
Program Category	INTERNSHIP
Period & Duration of the Program	03.01.2020 to 09.01.2020 (1 Week)
Area of Exposure	Programming Fundamentals, Control Statements, Arrays, Strings, Functions, Structure
Status	COMPLETED SUCCESSFULLY


Authorized Signatory
(Knowledge Services)

Head of Centre
Keltron Knowledge Centre
Municipal Shopping Complex
Mangalam, Kottayam-686 001


PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

Temp No: KSG/INTP/20/01/L4257

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Doc. No : KSG/H/10-16/006/5000



ICT ACADEMY OF KERALA

Certificate of Completion

This is to certify that

Luv Michael Surve

has successfully completed the 10-day Virtual Internship on

Machine Learning and Artificial Intelligence

organized by ICT ACADEMY OF KERALA

from 10-AUGUST-2020 to 19-AUGUST-2020



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MANGLAM COLLEGE OF ENGINEERING

Santhosh Kurup
Chief Executive Officer



ibsssoftware





ICT ACADEMY OF KERALA

Certificate of Completion

This is to certify that

Joel Cyriac

has successfully completed the 10-day Virtual Internship on
Machine Learning and Artificial Intelligence

organized by ICT ACADEMY OF KERALA
from 10-AUGUST-2020 to 19-AUGUST-2020

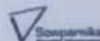


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MANGALAM COLLEGE OF ENGINEERING
ER JITHENDRAN

Santhosh Kurup
Chief Executive Officer



ibsssoftware





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CERTIFICATE

This is to certify that

Devu V S

Student of

Mangalam College of Engineering, Ettumanoor, Kottayam

Has completed 5 days internship training in ANDROID APP DEVELOPMENT from 2nd june 2021 at Techone Technologies Pvt.Ltd, Wayanad. During this intern period, we found him/her a sincere, honest, hardworking, dedicated student with a professional attitude along with a very good professional knowledge. We wish you every success in all future endeavours.

Date: 14-06-2021



Director
TECHONE TECHNOLOGIES PVT. LTD.

CIN:U72900KL2019PTC058909

techonetechnologies@gmail.com

Principal
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

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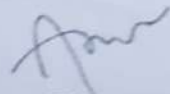
ABHISHEK HR

Student of

MANGALAM COLLEGE OF ENGINEERING ETTUMANOOR

Has completed 5 days internship training in **ANDROID APP DEVELOPMENT** from 2nd june 2021 at Techone Technologies Pvt.Ltd. Wayanad. During this intern period, we found him/her a sincere, honest, hardworking, dedicated student with a professional attitude along with a very good professional knowledge.
We wish you every success in all future endeavours.

Date: 14-06-2021



Director
TECHONE TECHNOLOGIES PVT. LTD.

CIN:U72900KL2019PTC058909



PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
ETTUMANOOR

techonetechnologies@gmail.com



CERTIFICATE

This is to certify that

Aravind P

Student of

MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR

Has completed 5 days internship training in ANDROID APP DEVELOPMENT from 2nd june 2021 at Techone Technologies Pvt.Ltd, Wayanad. During this intern period, we found him/her a sincere, honest, hardworking, dedicated student with a professional attitude along with a very good professional knowledge. We wish you every success in all future endeavours.

Date: 14-06-2021



Director
TECHONE TECHNOLOGIES PVT. LTD.

CIN:U72900KL2019PTC058909

techonetechnologies@gmail.com

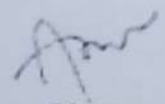
PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

CERTIFICATE

This is to certify that
HARSHA WILSON
Student of
MANGALAM COLLEGE OF ENGINEERING ETTUMANOOR

Has completed 5 days internship training in ANDROID APP DEVELOPMENT from 2nd june 2021 at Techone Technologies Pvt Ltd, Wayanad. During this intern period, we found him/her a sincere, honest, hardworking dedicated student with a professional attitude along with a very good professional knowledge. We wish you every success in all future endeavours.

Date: 14-06-2021



Director
TECHONE TECHNOLOGIES PVT. LTD.

CIN U72900KL2019PTC058909



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ETTUMANOOR

techonetechnologies@gmail.com



ALPHASYS 3D PRINTING SOLUTIONS

Reg No: K2/3344998/2021/CRUTIOMPA

CERTIFICATE OF INTERNSHIP

awarded to

ASHA BHADRA S KUMAR

from

MANGALAM COLLEGE OF ENGINEERING ETTUMANOOR

In recognition to his/her participation in 5 days online internship program on
Zero to Hero of Robotics conducted by

Alphasys 3D Printing Solutions from 16.09.2021 to 20.09.2021

Date : 23.09.2021
Cert. ID : ASIG1110



ANTHONY FRANCIS RAJAN
MANGALAM COLLEGE OF ENGINEERING ETTUMANOOR

Antony Francis Rajan
Managing Partner
Alphasys 3D Printing Solutions
East Marady, Muvattupuzha



ALPHASYS 3D PRINTING SOLUTIONS

Reg No: K2/3344998/2021/CRUTIOMPA

CERTIFICATE OF INTERNSHIP

awarded to

ASWATHY SASIKUMAR

from

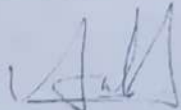
MANGALAM COLLEGE OF ENGINEERING ETTUMANOOR

In recognition to his/her participation in 5 days online internship program on
Zero to Hero of Robotics conducted by
Alphasys 3D Printing Solutions from 16.09.2021 to 20.09.2021

Date : 23.09.2021
Cert. ID : ASIG1055



Principal
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor


Antony Francis Rajan

Managing Partner
Alphasys 3D Printing Solutions
East Marady, Muvattupuzha



ALPHASYS 3D PRINTING SOLUTIONS

Reg No: K2/3344998 /2021/CRUTIOMPA

CERTIFICATE OF INTERNSHIP

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ASWATHY SASIKUMAR

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Alphasys 3D Printing Solutions from **16.09.2021 to 20.09.2021**

Date : 23.09.2021
Cert. ID : ASIG1055



Antony Francis Rajan
Managing Partner
Alphasys 3D Printing Solutions
East Morady, Muvattupuzha



CERTIFICATE OF APPRECIATION

This is to certify

Ms. Ganga P Chandran

For meritoriously completing internship with Tidbeat as
ASSOCIATE SOFTWARE TRAINEE starting from 13th April,
2021 to 8th July, 2021.

All the best!

Date

8th JULY, 2021

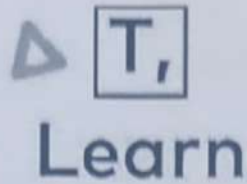
Director

A Achitha Reddy

A. Achitha Reddy

A handwritten signature in blue ink, appearing to be "A. Achitha Reddy".

PRINCIPAL
ANGALAM COLLEGE OF ENGINEERING
Ettimanoor



Certificate Of Internship

This is to certify that

Aswathy N

Has successfully completed an Internship as Campus Leader
at Techlearn.live from 31st December 2021 to 31st January 2022,
with exceptional leadership skills and team management.

Anant Chaturvedi
Head Of Marketing
TechLearn.live

PRINCIPAL
KANGARU COLLEGE OF ENGINEERING
Ettimanoor






Date: 25/03/2021

TO WHOM IT MAY CONCERN

This is to certify that Mr. Jobin Jose, (S/o Jose, Kizhakkekalayil, Kuruppanthara, Manjoor P.O, Kottayam - 686603) having the university registration number: MLM18CS056, B. Tech. Computer Science Engineering Student at Mangalam College of Engineering, Ettumanoor has successfully completed a three-month internship program in "Web & Mobile App Development" at ACNOVE IT SOLUTIONS PVT LTD, Kochi from 02/11/2020 to 22/02/2021.

His performance was extremely satisfactory during the internship.

For Acnove IT Solutions Pvt Ltd


Prabhul Sankar K S
Director




PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

Registered Office: Acnove IT Solutions Pvt Ltd, 49/1755L, Arakkal (H), Illathuparambu Road
AIMS, Ponekkara, Kochi, India 682041
CIN: U72200KL2018PTC053713 | www.acnove.com | info@acnove.com | +91-85900 41936



THE SPARKS FOUNDATION

INSPIRE, INNOVATE, INTEGRATE

CERTIFICATE OF COMPLETION

This Certificate is presented to

Sreelakshmi A M

*for an outstanding contribution during the session (May 2021 - Jun 2021) of
Graduate Rotational Internship Program at The Sparks Foundation on 01-Jun-2021.*



Certificate Number: VGRQ6UPDXH

Verification at:
<https://truecertificates.com/verification/>

Pranav Dubey
PRANAV DUBEY
MANAGING DIRECTOR

PRINCIPAL
ANGALAM COLLEGE OF ENGINEERING
EILAMANGALAM



Suven Consultants & Technology Pvt. Ltd.

Official member to



CERTIFICATE OF INTERNSHIP

This is to certify that **Sreelakshmi A M** has successfully completed 2 weeks (or 70 hrs) **Machine Learning Coding Internship**.

- 1) Building Chatbot for Online Food Ordering
- 2) Building Chat-bot for emulating Lab Coordinator at Diagnostics center

The projects were assessed by AI Engine trained by mentors as listed on <https://mentor.suvenconsultants.com>

Your performance was **Noteworthy** - 🏆🏆🏆🏆🏆 in the Online Internship. Wishing you all the best for more internships and a great career.

Your Internship Profile can be viewed on <https://internship.suvenconsultants.com/user?u=Y3JIYXRpdmVmZWxsb3dzcmVIMjlyQHNjdHBs>

Domain Expert: Rocky Jagtiani
Technical Head - SCTPL
<https://suvenconsultants.com>

Domain Expert: Niral Sharma
UI/UX expert and Software Engineer
NeoSOFT Technologies

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MANJANAM COLLEGE OF ENGINEERING
Erumangudi

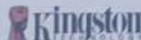
Domain Expert: Tarik Sheth
MCP, HP(AIS), CSTE, CSQA, CSTM
VP(in Investment Banking MNC)

Date of Issue: 01-02-2021

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Companies Recruiting

... & Many More





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CERTIFICATE OF COMPLETION

Certified that **Ms. Sreelakshmi A M**, student of **Mangalam College of Engineering, Ettumanoor, Kerala** has successfully completed *Three Months* Internship Training Programme on **"Python Django Framework"** offered by CAMINO INFOTECH Pvt. Ltd from 05.04.2021 to 10.07.2021.

Authorized Signatory

Camino Infotech
CUSAT PO
Kalamassery, Kochi, Ernakulam



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MANGALAM COLLEGE OF ENGINEERING
Ettumanoor



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CERTIFICATE OF COMPLETION

Certified that **Ms. Meera Anna Joseph**, student of **Mangalam College of Engineering, Ettumanoor, Kerala** has successfully completed *Three Month Industrial Training Programme on "Python Django Framework"* offered by CAMINO INFOTECH Pvt. Ltd from 09-11-2020 to 12-02-2021. During the period of her internship programme with us she was found punctual, hardworking and inquisitive.

Authorized Signatory

Camino Infotech
CUSAT PO
Kalamassery, Kochi, Ernakulam



Principal
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor



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CERTIFICATE OF COMPLETION

This Certificate is presented to

Law Surve

for an outstanding contribution during the session (Aug 2020 - Sep 2020) of
Graduate Rotational Internship Program at The Sparks Foundation on 18-Sep-2020.



xaltius.tech



aine.ai



codefor.in

COLLABORATIVE PARTNERS



PRINCIPAL
LANGALAM COLLEGE OF ENGINEERING
ETOHUR

Pranav Dubey

PRANAV DUBEY

MANAGING DIRECTOR

Certificate Number: 2GQCNKNS6X


Verify at www.thesparksfoundation.info/verify

Date: 26/09/2020

TO WHOM IT MAY CONCERN

This is to certify that Ms. Aishwarya Suresh, (Ettickal House, Pulickalkavala P O, Kottayam, Kerala) having the university registration number MLM18CS004, B Tech. Computer Science Engineering Student at Mangalam College of Engineering, Ettumanoor has successfully completed a one month internship program in "Web Development" at ACNOVE IT SOLUTIONS PVT LTD, Kochi from 26/08/2020 to 25/09/2020

For Acnove IT Solutions Pvt Ltd


Prabhul Sankar K S
Director




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MANGALAM COLLEGE OF ENGINEERING
Ettumanoor



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o o o

CERTIFICATE OF COMPLETION

Certified that **Ms. Arya Binu**, student of **Mangalam College of Engineering, Ettumanoor, Kerala** has successfully completed *15 Days* Internship programme on "**Machine Learning**" offered by CAMINO INFOTECH Pvt.Ltd from 24-04-2021 to 08-05-2021.

Authorized Signatory

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Kalamassery, Kochi, Ernakulam

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Ettumanoor





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CERTIFICATE OF COMPLETION

Certified that Ms. Aswathy S, student of Mangalam College of Engineering, Ettumanoor, Kerala has successfully completed 15 Days Internship programme on "Machine Learning" offered by CAMINO INFOTECH Pvt.Ltd from 24-04-2021 to 08-05-2021.

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Ettumanoor



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CERTIFICATE OF COMPLETION

Certified that Ms. Aswathy T S, student of Mangalam College of Engineering, Ettumanoor, Kerala has successfully completed *15 Days* Internship programme on "Machine Learning" offered by CAMINO INFOTECH Pvt.Ltd from 24-04-2021 to 08-05-2021.

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Kalamassery, Kochi, Ernakulam



MANGALAM COLLEGE OF ENGINEERING
Ettumanoor



MAGOIN PRIVATE LIMITED

45-C, Muttar P O, Alappuzha-689574, Kerala, India

Phone: 8129880560/ 9400376354

Email: magoin2019@gmail.com

Magoin/certificates/r&d/2020/97

26/12/2020

CERTIFICATE

Subject: Research Internship Training

This is to certify that Mr. John T M, student of Mangalam Engineering College, Kottayam; has successfully completed his internship training in our research activities from 17th December 2020 to 24th December 2020

His character and behaviour are seemed to be good during his association with us.

Thank you,

Ajin S

Director,

Magoin Private Limited



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MANGALAM COLLEGE OF ENGINEERING
Ettumanoor



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LOADING TO NATIEN

TORC INFOTECH PRIVATE LIMITED


TORC INFOTECH
OLD ROAD, KALAMASSERY
KOCHI, KERALA

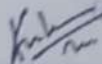
SL NO: TOR7X633

TO WHOMSEVER IT MAY CONCERN

This is to certify that AKHIL KURIAN, a student of MANGALAM COLLEGE OF ENGINEERING has completed a 15-day internship training in CYBER SECURITY & ETHICAL HACKING with INDUSTRIAL 4.0 from April 27, 2021 at TORC INFOTECH PVT LTD, Kochi. During this intern period, We found him a sincere, honest, hardworking and dedicated student with a professional attitude who is proactive and is constantly looking to improve his skillset. We also observed that he is skilled at his field.

We wish him every success in all future endeavours


PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Kochi


ABHI KRISHNA H
CEO



Date Signed



9001:2015

14



TORC INFOTECH
Kochi, Kerala

TORC INFOTECH PRIVATE LIMITED

TORC INFOTECH
OLD ROAD, KALAMASSERY
KOCHI, KERALA

SL NO: TOR7X631

TO WHOMSEVER IT MAY CONCERN

This is to certify that ALAN SEBASTIAN XAVIER, a student of MANGALAM COLLEGE OF ENGINEERING has completed a 15-day internship training in CYBER SECURITY & ETHICAL HACKING with INDUSTRIAL 4.0 from April 27, 2021 at TORC INFOTECH PVT LTD, Kochi. During this intern period, We found him a sincere, honest, hardworking and dedicated student with a professional attitude who is proactive and is constantly looking to improve his skillset. We also observed that he is skilled at his field.

We wish him every success in all future endeavours

PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Ethurambadi

ABHI KRISHNA H
CEO



Date Signed



9001:2015



TORC INFOTECH

TORC INFOTECH PRIVATE LIMITED

TORC INFOTECH
OLD ROAD - KALAMANGALY
KOCHI - KERALA

SI NO TORX621

TO WHOMSEVER IT MAY CONCERN

This is to certify that ADITHYA PRADEEP, a student of MANGALAM COLLEGE OF ENGINEERING has completed a 15-day internship training in CYBER SECURITY & ETHICAL HACKING with INDUSTRIAL 4.0 from April 27, 2021 at TORC INFOTECH PVT LTD, Kochi. During this intern period, We found her a sincere, honest, hardworking and dedicated student with a professional attitude who is proactive and is constantly looking to improve her skillset. We also observed that she is skilled at her field.

We wish her every success in all future endeavours

ABHI KRISHNA H
CEO

PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor



SEAL



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TORC INFOTECH PRIVATE LIMITED

TORC INFOTECH
OLD ROAD, KALAMASSERY
KOCHI, KERALA

SL NO: TOR7X632

TO WHOMSEVER IT MAY CONCERN

This is to certify that ABIN BABY, a student of MANGALAM COLLEGE OF ENGINEERING has completed a 15-day internship training in CYBER SECURITY & ETHICAL HACKING with INDUSTRIAL 4.0 from April 27, 2021 at TORC INFOTECH PVT LTD, Kochi. During this intern period, We found him a sincere, honest, hardworking and dedicated student with a professional attitude who is proactive and is constantly looking to improve his skillset. We also observed that he is skilled at his field.

We wish him every success in all future endeavours

PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

ABHI KRISHNA H
CEO



Date Signed



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TORC INFOTECH PRIVATE LIMITED

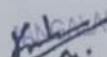
TORC INFOTECH
OLD ROAD, KALAMASSERY
KOCHI, KERALA

SL NO: TOR7X619

TO WHOMSEVER IT MAY CONCERN

This is to certify that ABEL DAVID RAJAN, a student of MANGALAM COLLEGE OF ENGINEERING has completed a 15-day internship training in CYBER SECURITY & ETHICAL HACKING with INDUSTRIAL 4.0 from April 27, 2021 at TORC INFOTECH PVT LTD, Kochi. During this intern period, We found him a sincere, honest, hardworking and dedicated student with a professional attitude who is proactive and is constantly looking to improve his skillset. We also observed that he is skilled at his field.

We wish him every success in all future endeavours


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MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

ABHI KRISHNA H
CEO



Date Signed



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18



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CERTIFICATE OF COMPLETION

Certified that Ms. Aswathy S, student of Mangalam College of Engineering, Ettumanoor, Kerala has successfully completed 15 Days Internship programme on "Machine Learning" offered by CAMINO INFOTECH Pvt.Ltd from 24-04-2021 to 08-05-2021.

Authorized Signatory

PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

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CUSAT PO
Kalamassery, Kochi, Ernakulam





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CERTIFICATE OF COMPLETION

Certified that **Ms. Aswathy Sasikumar**, student of **Mangalam College of Engineering, Ettumanoor, Kerala** has successfully completed *15 Days* Internship programme on **"Machine Learning"** offered by CAMINO INFOTECH Pvt.Ltd from 24-04-2021 to 08-05-2021.

Authorized Signatory

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Kalamassery, Kochi, Ernakulam

Principal
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor





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CERTIFICATE OF COMPLETION

Certified that Ms. Anamika K, student of Mangalam College of Engineering, Ettumanoor, Kerala has successfully completed 15 Days Internship programme on "Machine Learning" offered by CAMINO INFOTECH Pvt.Ltd from 24-04-2021 to 08-05-2021.

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Ettumanoor



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CERTIFICATE OF COMPLETION

Certified that **Ms. Aparna Babu**, student of **Mangalam College of Engineering, Ettumanoor, Kerala** has successfully completed *15 Days* Internship programme on **"Machine Learning"** offered by **CAMINO INFOTECH Pvt.Ltd** from **24-04-2021 to 08-05-2021**.

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Kalamassery, Kochi, Ernakulam



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Ettumanoor



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CERTIFICATE OF COMPLETION

Certified that Ms. Anumol Sajan, student of Mangalam College of Engineering, Ettumanoor, Kerala has successfully completed 15 Days Internship programme on "Machine Learning" offered by CAMINO INFOTECH Pvt.Ltd from 24-04-2021 to 08-05-2021.

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Kalamassery, Kochi, Ernakulam

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MANGALAM COLLEGE OF ENGINEERING
Ettumanoor



Letter of Completion

October 8th, 2021

This is to certify that Ms. Ganga P Chandran, has successfully completed her 5-month Internship at Content-Whale as a Content Writer from 11th April, 2021 till 30th September, 2021.

During her tenure with our organization, she was responsible for writing creative content in terms of SEO, Blogs, Business writing and advertisements. She was also responsible for writing for our international clients and following the instructions provided.

She participated in performing her work with determination and sincerity and successfully catered 24 clients in her tenure.

She was found to be quite devoted, motivated, professional, hard-working and an innovative person towards her work. We wish her great success in her career and life.

Warm Regards,

Tejas Deshmukh
HR
(Content-Whale)
www.content-whale.com


PRINCIPAL
KANGALAM COLLEGE OF ENGINEERING
Ettumanoor

Content-Whale

Company GST. No.- 23DJVPK9784E1ZH
Corporate Office: 222, Kopri village road, Sector 28, Vashi, Navi Mumbai



admin@content-whale.com | www.content-whale.com



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CERTIFICATE OF COMPLETION

Certified that Ms. Aswathy N, student of Mangalam College of Engineering, Ettumanoor, Kerala has successfully completed 15 Days Internship programme on "Machine Learning" offered by CAMINO INFOTECH Pvt.Ltd from 24-04-2021 to 08-05-2021.

Authorized Signatory

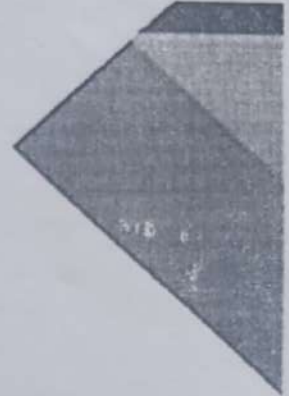
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Ettumanoor





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CERTIFICATE OF COMPLETION

Certified that Ms. Archana P Udayan, student of Mangalam College of Engineering, Ettumanoor, Kerala has successfully completed 15 Days Internship programme on "Machine Learning" offered by CAMINO INFOTECH Pvt.Ltd from 24-04-2021 to 08-05-2021.

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Ettumanoor

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CERTIFICATE OF COMPLETION

Certified that Ms. Archana Raju, student of Mangalam College of Engineering, Ettumanoor, Kerala has successfully completed *15 Days Internship* programme on "Machine Learning" offered by CAMINO INFOTECH Pvt.Ltd from 24-04-2021 to 08-05-2021.

Authorized Signatory

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Kalamassery, Kochi, Ernakulam



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MANGALAM COLLEGE OF ENGINEERING
Ettumanoor



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CERTIFICATE OF COMPLETION

Certified that Ms. Alswarya Sajl, student of Mangalam College of Engineering, Ettumanoor, Kerala has successfully completed 15 Days Internship programme on "Machine Learning" offered by CAMINO INFOTECH Pvt.Ltd from 24-04-2021 to 08-05-2021.

Authorized Signatory

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Ettumanoor



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0-00

CERTIFICATE OF COMPLETION

Certified that **Ms. Elizabeth K Jacob**, student of **Mangalam College of Engineering, Ettumanoor, Kerala** has successfully completed **15 Days Internship** programme on **"Machine Learning"** offered by CAMINO INFOTECH Pvt.Ltd from **24-04-2021 to 08-05-2021**.

Authorized Signatory

Camino Infotech
CUSAT PO
Kalamassery, Kochi, Ernakulam

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Ettumanoor



To:

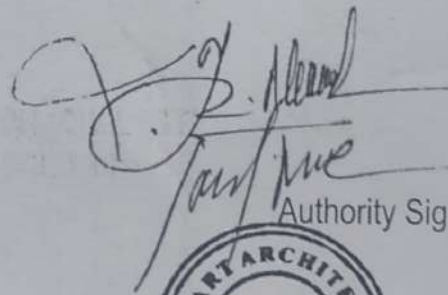
The Principal
Mangalam College of Engineering
Ettumanoor, Kottayam

**SUBJECT : INTERNSHIP TRAINING B.TECH (CIVIL) STUDENT
NITHEESH P ARUN (MLM19CI:056)**

Sir/Madam

The above named B.Tech Civil student of your college has undergone internship training at our various projects for the period from, 24 December 2021 to 02 January 2022. This student has shown keen interest towards various construction methods and modern technology. We wish him all the best in his studies and future endeavors.

Nilambur
02 January 2022


Authority Signature




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MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

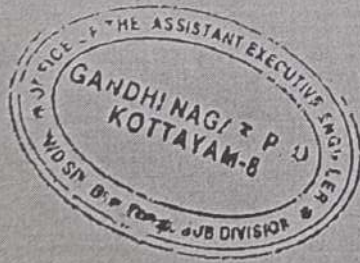
PUBLIC WORKS DEPARTMENT

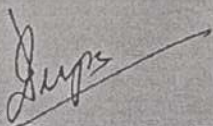
Office of the Asst. Executive Engineer
PWD Special Buildings Sub Division
Gandhinagar.P.O., Kottayam- 686008
Ph: 0481 2597218
pwdsplbldgs@gmail.com

CERTIFICATE

Certified that Miss.Parvathy Krishna, student of second semester B.Tech Civil Engineering of MANGALAM COLLEGE OF ENGINEERING has been successfully undergone practical training from 02nd July 2018 to 6th July 2018 (5 days) under the supervision of this office for the partial fulfillment of her B.Tech curriculum.

Gandhinagar
09.07.2018




Assistant Executive Engineer
Assistant Executive Engineer
PWD SPL Buildings Sub Division
Gandhinagar P.O. Kottayam - 8



MANGALAM



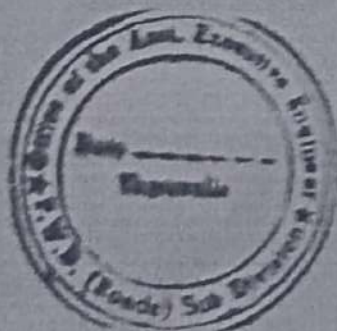
PUBLIC WORKS DEPARTMENT
ROADS SUB DIVISION, THIRUVALLA

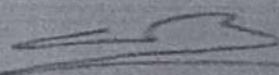
PH-68V101

CERTIFICATE

This is to certify that Ms. Jetcy Elizabeth Philip, 2nd Semester, Civil Engineering Student of Mangalam College of Engineering, Vettimukal P.O, Ettumanoor, Kottayam has been successfully Completed 5 days Internship Training from 02/07/2018 to 06/07/2018 under this Office.

Thiruvalla,
10-07-2018




Assistant Executive Engineer
Assistant Executive Engineer
P. W. D. (Roads) Sub Division
Thiruvalla


MANGALAM COLLEGE OF ENGINEERING
Vettimukal P.O, Ettumanoor, Kottayam

30/08/2019

CERTIFICATE

This is to certify that Mr. Timothy Ninan Thomas, Vanjipathra Puthenpurayil, Kadapra P.O, Kumbanad, Thiruvalla, Pathanamthitta Dist, Kerala 689 547 was working as Site Supervisor in our Construction Company from 22/07/2019 to 26/07/2019.

He has supervised our PWD Job of Kumbanad - Arattupuzha Road . He was maintaining good support with officials and co-operative with colleagues.


PRASAD MATHEW


PRINCIPAL
ANGALAM COLLEGE OF ENGINEERING
Ettimoneer



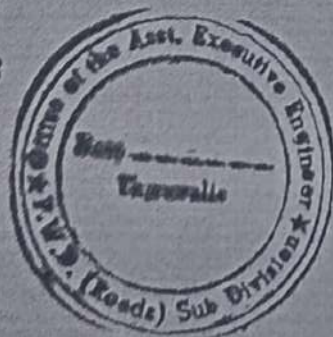
**PUBLIC WORKS DEPARTMENT
ROADS SUB DIVISION, THIRUVALLA**

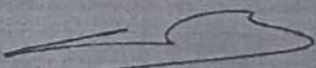
PIN-689101

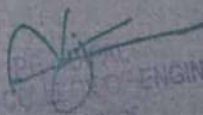
CERTIFICATE

This is to certify that Ms. Kavya Prakash, 2nd Semester, Civil Engineering Student of Mangalam College of Engineering, Vettimukal .P.O, Ettumanoor, Kottayam has been successfully Completed 5 days Internship Training from 02/07/2018 to 06/07/2018 under this Office.

Thiruvalla,
10-07-2018




Assistant Executive Engineer
ASST. EXECUTIVE ENGR.
P. W. D. (Roads) Sub Divn.
Thiruvalla


MANGALAM COLLEGE OF ENGINEERING
KOTTAYAM

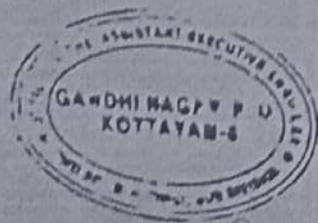
PUBLIC WORKS DEPARTMENT

Office of the Asst. Executive Engineer
PWD Special Buildings Sub Division
Gandhinagar P.O., Kottayam - 686008
Ph: 0481 2597212
pwdspblbds@gmail.com

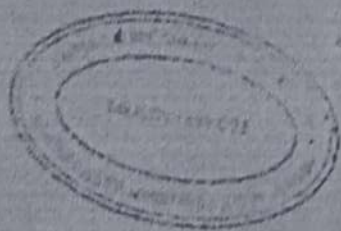
CERTIFICATE

Certified that Miss. Prajitha Prakash, student of second semester Civil Engineering of Mangalam College of Engineering, Ettumanoor has successfully completed the Internship from 19th June 2018 to 23rd June 2018 (5 days) under the supervision of this office for the partial fulfillment of her B.Tech curriculum.

Gandhinagar
27.06.2018



[Signature]
Assistant Executive Engineer
PWD SPL Buildings Sub Division
Gandhinagar P.O., Kottayam - 8



[Signature]
Principal
Mangalam College of Engineering
Ettumanoor

1

[Signature]

PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
ETTUMANOOR

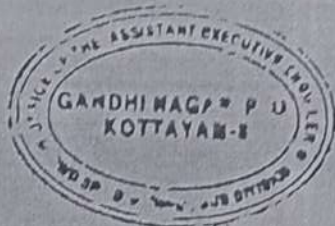
PUBLIC WORKS DEPARTMENT

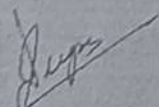
Office of the Asst. Executive Engineer
PWD Special Buildings Sub Division
Gandhinagar.P.O., Kottayam- 686008
Ph: 0481 2597218
pwdspbltdgs@gmail.com

CERTIFICATE


Certified that Miss. Theresa Sebastian, student of second semester Civil Engineering of Mangalam College of Engineering, Ettumanoor has successfully completed the internship from 19th June 2018 to 23rd June 2018 (5 days) under the supervision of this office for the partial fulfillment of her B.Tech curriculum.

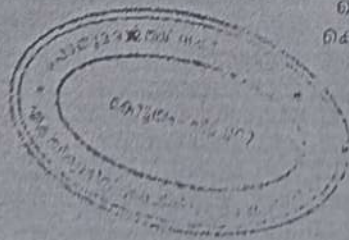
Gandhinagar
27.06.2018





Assistant Executive Engineer
PWD SPL Buildings Sub Division
Gandhinagar P.O., Kottayam - 8

Counter sign


പ്രൊഫസർ കൃഷ്ണദാസൻ
പൊതുജനസൗകര്യ സെക്ഷൻ
കെട്ടിടനിർമ്മാണം, കോട്ടയം - 2




PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
ETTUMANOOR

PUBLIC WORKS DEPARTMENT

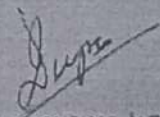
Office of the Asst. Executive Engineer
PWD Special Buildings Sub Division
Gandhinagar.P.O., Kottayam- 686008
Ph: 0481 2597218
pwdsplbldgs@gmail.com

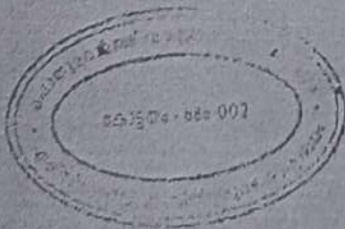
CERTIFICATE

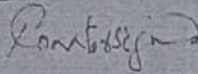
Certified that Miss. Minnu Biju, student of second semester Civil Engineering of Mangalam College of Engineering, Ettumanoor has successfully completed the internship from 19th June 2018 to 23rd June 2018 (5 days) under the supervision of this office for the partial fulfillment of her B.Tech curriculum.


Gandhinagar
27.06.2018

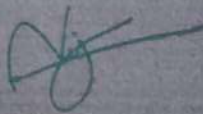



Assistant Executive Engineer
PWD SPL Buildings Sub Division
Gandhinagar P.O., Kottayam - 8






എക്സിക്യൂട്ടീവ് എഞ്ചിനീയർ
പൊതുക്കോമൺ വകുപ്പ്
കെട്ടിടവിഭാഗം, കൊട്ടയം - 2


PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

PUBLIC WORKS DEPARTMENT

Office of the Asst. Executive Engineer
PWD Special Buildings Sub Division
Gandhinagar.P.O., Kottayam- 686008
Ph: 0481 2597218
pwdspibldgs@gmail.com,

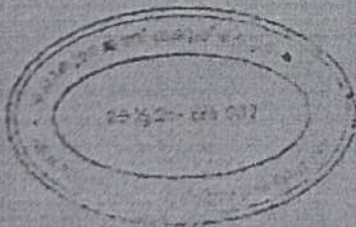
CERTIFICATE

Certified that Miss. Mariya Jose, student of second semester Civil Engineering of Mangalam College of Engineering, Ettumanoor has successfully completed the internship from 19th June 2018 to 23rd June 2018 (5 days) under the supervision of this office for the partial fulfilment of her B.Tech curriculam.

Gandhinagar
27.06.2018



[Signature]
Assistant Executive Engineer
PWD SPL Buildings Sub Division
Gandhinagar P.O. Kottayam - 686008



[Signature]
എ.കെ.സി.കൃഷ്ണൻ
പൊതുമരാമത്ത് വകുപ്പ്
കെട്ടിടവിഭാഗം, കോട്ടയം - 2

[Signature]
PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
ETTUMANOOR

24.07.2018

INDUSTRIAL TRAINING CERTIFICATE

This is to certify that Mr. Jithu Abraham James (Reg No. MLM17CE059) pursuing his 2nd semester B Tech in Civil Engineering from Mangalam College of Engineering, Ettumanoor, Kottayam has completed an industrial training at Asset Homes Pvt Ltd from 30.07.2018 to 24.07.2018.

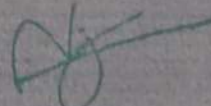
The project visited and undertaken by him for these 5 days was Asset Christelle & Carol

He worked well as part of his training and submitted the report to us. The report on evaluation fulfills all the stated criteria. I hereby certify that his work was good to the best of my knowledge.

For Asset Homes Pvt Limited


Seema Sankaran

Sr. Manager - HR & Admin


PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
ETTUMANOOR

24.07.2018

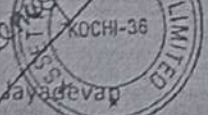
INDUSTRIAL TRAINING CERTIFICATE

This is to certify that Mr. Stanly John (Reg No. MLM17CE096) pursuing his 2nd semester B Tech in Civil Engineering from Mangalam College of Engineering, Ettumanoor, Kottayam has completed an Industrial Training at Asset Homes Pvt Ltd from 10.07.2018 to 14.07.2018.

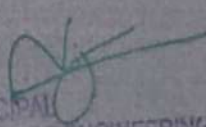
The project visited and undertaken by him for these 5 days was Asset Chrisbelle & Carol

He worked well as part of his training and submitted the report to us. The report on evaluation fulfills all the stated criteria. I hereby certify that his work was good to the best of my knowledge.

For Asset Homes Pvt Limited



Seema Jayadevan
Sr. Manager - HR & Admin



PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING

24.07.2018

INDUSTRIAL TRAINING CERTIFICATE

This is to certify that Mr. Prasanth N.P (Reg No. MLM17CE081) pursuing his 2nd semester B Tech in Civil Engineering from Mangalam College of Engineering, Ettumanoor, Kottayam has completed an Industrial Training at Asset Homes Pvt Ltd from 10.07.2018 to 14.07.2018.

The project visited and undertaken by him for these 5 days was Asset Chrisbelle & Carol.

He worked well as part of his training and submitted the report to us. The report on evaluation fulfills all the stated criteria. I hereby certify that his work was good to the best of my knowledge.

For Asset Homes Pvt Limited



Seema J. J. J. J.
Sr. Manager - HR & Admin

A handwritten signature in blue ink, likely belonging to the Principal of Mangalam College of Engineering.

PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING

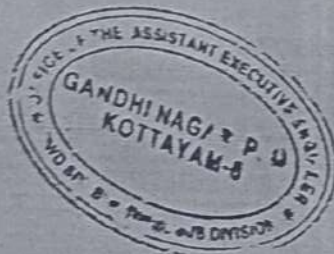
PUBLIC WORKS DEPARTMENT

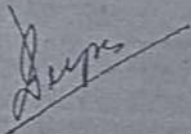
Office of the Asst. Executive Engineer
PWD Special Buildings Sub Division
Gandhinagar.P.O., Kottayam- 686008
Ph: 0481 2597218
pwdsplbldgs@gmail.com

CERTIFICATE

Certified that Miss. Saifa Naufal, student of second semester B.Tech Civil Engineering of MANGALAM COLLEGE OF ENGINEERING has been successfully undergone practical training from 02nd July 2018 to 6th July 2018 (5 days) under the supervision of this office for the partial fulfillment of her B.Tech curriculum.

Gandhinagar
09.07.2018




Assistant Executive Engineer

Assistant Executive Engineer
PWD SPL Buildings Sub Division
Gandhinagar P.O., Kottayam - 8


PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING

PUBLIC WORKS DEPARTMENT

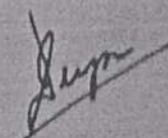
Office of the Asst. Executive Engineer
PWD Special Buildings Sub Division
Gandhinagar P.O., Kottayam - 686008
Ph. 0481 2597218
pwd.spbldgs@gmail.com

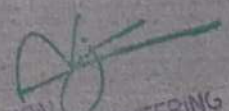
CERTIFICATE

Certified that Miss. Neenu Vijayan student of second semester Civil Engineering of Mangalam College of Engineering, Ettumanoor has successfully completed the internship from 9th July 2018 to 13th July 2018 (5 days) under the supervision of this office for the partial fulfillment of her B.Tech curriculum.

Gandhinagar
16.07.2018




Assistant Executive Engineer
Assistant Executive Engineer
PWD SPL Buildings Sub Division
Gandhinagar P.O., Kottayam - 8


PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

PUBLIC WORKS DEPARTMENT


Office of the Asst. Executive Engineer
PWD Special Buildings Sub Division
Gandhinagar.P.O., Kottayam- 686008
Ph: 0481 2597218
pwdsplbldgs@gmail.com,


CERTIFICATE

Certified that Miss. Lekshmi priya Anil student of second semester Civil Engineering of Mangalam College of Engineering, Ettumanoor has successfully completed the internship from 9th July 2018 to 13th July 2018 (5 days) under the supervision of this office for the partial fulfillment of her B.Tech curriculum.

Gandhinagar
16.07.2018




Assistant Executive Engineer
Assistant Executive Engineer
PWD SPL Buildings Sub Division
Gandhinagar P.O. Kottayam - 8


PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING



KERALA WATER AUTHORITY

Office of the Executive Engineer

Project Division, Adoor,

Phone: - 04734 224839

e-mail: pdadoor@gmail.com

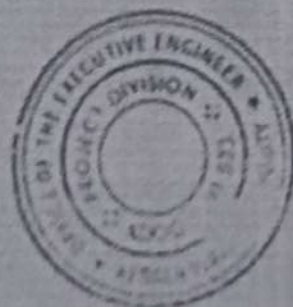
DATE: 12.07.2018

No. PWA/AC/EN/2018

TO WHOM IT MAY CONCERN

This is to certify that Miss. Merrin Jose (Reg. No. MLM17CE069) student of second semester Civil Engineering, Mangalam College of Engineering, Ettumanoor, Kottayam has successfully completed five day internship from 05.07.2018 to 10.07.2018 and submitted a detailed report regarding the same under the supervision of this office for the partial fulfilment of her B- tech curriculum

We wish them all the success in their future endeavors.



Assistant Engineer

ASSISTANT ENGINEER I
KERALA WATER AUTHORITY
PROJECT DIVISION, ADOOR

PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING

24.07.2018

INDUSTRIAL TRAINING CERTIFICATE

This is to certify that Mr. Yadhu Krishnan K.M (Reg No. MLM17CE103) pursuing his 2nd semester B Tech in Civil Engineering from Mangalam College of Engineering, Ettumanoor, Kottayam has completed an Industrial Training at Asset Homes Pvt Ltd from 10.07.2018 to 14.07.2018.

The project visited and undertaken by him for these 5 days was Asset Chrisbelle & Carol.

He worked well as part of his training and submitted the report to us. The report on evaluation fulfills all the stated criteria. I hereby certify that his work was good to the best of my knowledge.

For Asset Homes Private Limited



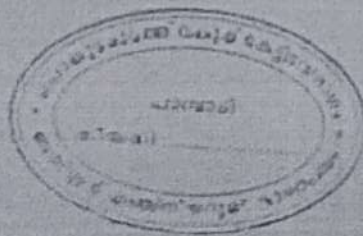
Seema Jayadevan,
Sr. Manager - HR & Admin

Principal
MANGALAM COLLEGE OF ENGINEERING
ETTUMANOOR

ASSET HOMES PRIVATE LIMITED
CIN: U45201KL2006PTC019867

CERTIFICATE

This is to certify that Sri. Aswin Jayan, Francis Joseph, Nandhu Pradeep, Jithin Somanajan, R. Rajat, J. Anand Sankar and Thomas Siby, 2nd semester B Tech students of Mangalam College of Engineering has attended the construction site of building for Architecture Block at Raja Gandhi Institute of Technology Kottayam from 02.07.2018 to 06.07.2018 as part of internship. This certificate is issued as requested by the students for submitting to the college authorities.



സജിക്യമാർ കെ. ജി.
അസിസ്റ്റന്റ് പ്രിൻസിപ്പാൾ
പൊതുവകുപ്പ് വകുപ്പ്
കോളേജ് വിഭാഗം മേധാവ്
കോട്ടയം

PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
KOTTAYAM



Antony Thomas Contracting Pvt. Ltd.

GSTIN: J2AAJCA4731E1Z4

33/1883 A, (46/3607), Adappilly Road
Vennala, Kochi - 682 028
Phone : 0484 - 2809051
Mob : 9544900820
Email : atangg@gmail.com
Website : www.atcl.co

23-07-2018

To,

The Principal

Mangalam College of Engineering

Ettumanoor

SUB: INTERNSHIP COMPLETION LETTER

We are glad to inform you that Mr. Sherin Skaria (MLM17CE091) from Mangalam College of Engineering, Ettumanoor, Kottayam, has successfully completed his internship in our site St. Mary's Church, Parel, Changanassery from 28th June 2018 to 3rd July 2018.

During his internship, he was exposed to the various activities in Civil Construction Works.

We found him extremely inquisitive and hard working. He was very much interested to learn the functions of our core division and also willing to put his best efforts and get in to the depth of the subject to understand it better.

His association with us was very fruitful and we wish him all the best in his future endeavours.

For Antony Thomas Contracting Pvt Ltd

Authorized Signatory

PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
ETTUMANOOR



PUBLIC WORKS DEPARTMENT

Office of the Asst. Executive Engineer
PWD Special Buildings Sub Division
Gandhinagar P.O., Kottayam- 686008
Ph. 0481 2597218
pwdspfbldgs@gmail.com.

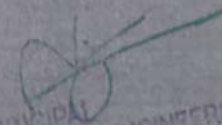
CERTIFICATE

Certified that Miss. Meenu P Prasad, student of second semester B.Tech Civil Engineering of MANGALAM COLLEGE OF ENGINEERING has been successfully undergone practical training from 02nd July 2018 to 6th July 2018 (5 days) under the supervision of this office for the partial fulfillment of her B.Tech curriculum.

Gandhinagar
09.07.2018



Assistant Executive Engineer
Assistant Executive Engineer
PWD S.P.L Buildings Sub Division
Gandhinagar P.O., Kottayam - 8


PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING



PUBLIC WORKS DEPARTMENT
ROADS SUB DIVISION, THIRUVALLA

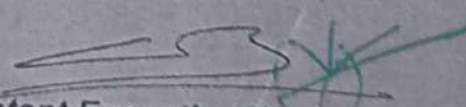
PIN-689101

CERTIFICATE

This is to certify that Ms. Sarah¹ Mariam Abraham, 2nd Semester, Civil Engineering Student of Mangalam College of Engineering, Vettimukal .P.O, Ettumanoor, Kottayam has been successfully Completed 5 days Internship Training from 02/07/2018 to 06/07/2018 under this Office.

Thiruvalla,
10-07-2018




Assistant Executive Engineer
Assistant Executive Engineer ENGINEERING
P. W. D. (Roads) Sub Divisn.
Thiruvalla



**PUBLIC WORKS DEPARTMENT
ROADS SUB DIVISION, THIRUVALLA**

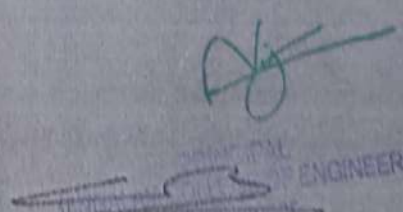
PIN-689101

CERTIFICATE

This is to certify that Ms. Priya Venugopal, 2nd Semester, Civil Engineering Student of Mangalam College of Engineering, Vettimukal .P.O, Ettumanoor, Kottayam has been successfully Completed 5 days Internship Training from 02/07/2018 to 06/07/2018 under this Office.

Thiruvalla,
10-07-2018




Assistant Executive Engineer
P. W. D. (Roads) Sub Divn.
Thiruvalla

PUBLIC WORKS DEPARTMENT

Office of the Asst. Executive Engineer
PWD Special Buildings Sub Division
Gandhinagar, P.O., Kottayam- 686008
Ph: 0481-259721
pwd-spbldes@gmail.com

CERTIFICATE

Certified that Miss. Jayalekshmi S.J , student of second semester B.Tech Civil Engineering of MANGALAM COLLEGE OF ENGINEERING has been successfully undergone practical training from 02nd July 2018 to 6th July 2018 (5 days) under the supervision of the office for the partial fulfillment of her B.Tech curriculum.

Gandhinagar
09.07.2018



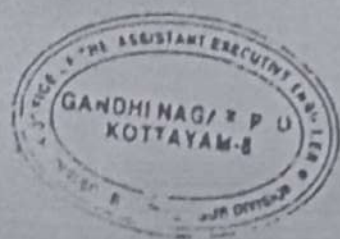
[Signature]
Assistant Executive Engineer
Assistant Executive Engineer
PWD SPL Buildings Sub Division
Gandhinagar P.O., Kottayam - 8

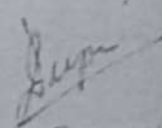
[Signature]
ENGINEERING

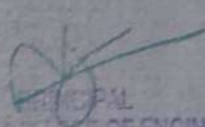
CERTIFICATE

Certified that Miss. Sneha Punnoose student of second semester Civil Engineering of Mangalam College of Engineering, Ettumanoor has successfully completed the internship from 9th July 2018 to 13th July 2018 (5 days) under the supervision of this office for the partial fulfillment of her B.Tech curriculum.

Gandhinagar
16.07.2018




Assistant Executive Engineer
Assistant Executive Engineer
PWD SPL Buildings Sub Division
Gandhinagar P.O., Kottayam - 8


ANGAMALAM COLLEGE OF ENGINEERING
Ettumanoor

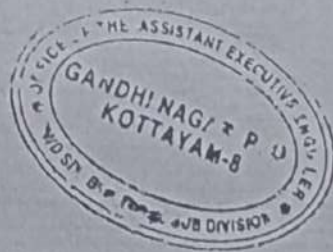
PUBLIC WORKS DEPARTMENT

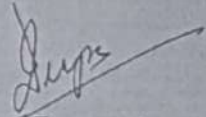
Office of the Asst. Executive Engineer
PWD Special Buildings Sub Division
Gandhinagar.P.O., Kottayam- 686008
Ph: 0481 2597218
pwdspblblds@gmail.com

CERTIFICATE

Certified that Miss.Parvathy Krishna, student of second semester B.Tech Civil Engineering of MANGALAM COLLEGE OF ENGINEERING has been successfully undergone practical training from 02nd July 2018 to 6th July 2018 (5 days) under the supervision of this office for the partial fulfillment of her B.Tech curriculam.

Gandhinagar
09.07.2018




Assistant Executive Engineer
Assistant Executive Engineer
PWD SP'L Buildings Sub Division
Gandhinagar P.O. Kottayam - 8


MANGALAM COLLEGE OF ENGINEERING
KOTTAYAM



PUBLIC WORKS DEPARTMENT
ROADS SUB DIVISION, THIRUVALLA

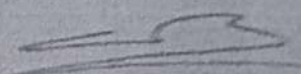
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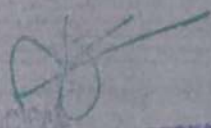
CERTIFICATE

This is to certify that Ms. Jetcy Elizabeth Philip, 2nd Semester, Civil Engineering Student of Mangalam College of Engineering, Vettimukal P.O, Ettumanoor, Kottayam has been successfully Completed 5 days Internship Training from 02/07/2018 to 06/07/2018 under this Office.

Thiruvalla,
10-07-2018




Assistant Executive Engineer
Assistant Executive Engineer
P. W. D. (Roads) Sub Division
Thiruvalla.


MANGALAM COLLEGE OF ENGINEERING
Thiruvalla



**PUBLIC WORKS DEPARTMENT
ROADS SUB DIVISION, THIRUVALLA**

PIN-689101

CERTIFICATE

This is to certify that Ms. Kavya Prakash, 2nd Semester, Civil Engineering Student of Mangalam College of Engineering, Vettimukal .P.O, Ettumanoor, Kottayam has been successfully Completed 5 days Internship Training from 02/07/2018 to 06/07/2018 under this Office.

Thiruvalla,

10-07-2018



Assistant Executive Engineer
ASISTIAN EXECUTIVE ENGINEER
P. W. D. (Roads) Sub Divn
Thiruvalla

30/08/2019

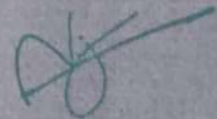
CERTIFICATE

This is to certify that Mr. Timothy Ninan Thomas, Vanjipathra Puthenpurayil, Kadapra P.O, Kumbanad, Thiruvalla, Pathanamthitta Dist, Kerala 689 547 was working as Site Supervisor in our Construction Company from 22/07/2019 to 26/07/2019.

He has supervised our PWD Job of Kumbanad - Arattupuzha Road . He was maintaining good support with officials and co-operative with colleagues.


PRASAD MATHEW

PRINCIPAL
KANGALAM COLLEGE OF ENGINEERING
ER. HINDU




DEPARTMENT OF MANAGEMENT
MANGALAM COLLEGE OF ENGINEERING, KOTTAYAM



This is to certify that this Internship Report is a bonafide record of the work done By **NANDANA NANDAKUMAR** (Reg No : ML319MBA60) as a part of the Internship work during the Third trimester at **Elektron Controls Ltd** in partial fulfillment of the requirements for the award of the degree of **MASTER OF BUSINESS ADMINISTRATION** of **A P J Abdul Kalam Technological University, Thiruvananthapuram** Under the guidance of **Ms.FATHIMA SHIRIN SHAJI**, Assistant Professor, Mangalam College of Engineering, Ettumanoor, Kottayam

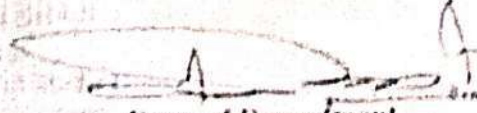



Faculty Guide



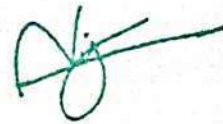
Head of Department

DR. SIBU C. CRITHIDAN
MBA, M.Phil (Management Studies)
Head, Dept. of Management Studies
Mangalam College of Engineering
Ettumanoor, Kottayam.



Dean of Department





PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

DEPARTMENT OF MANAGEMENT STUDIES
MANGALAM COLLEGE OF ENGINEERING
ETTUMANOOR
KOTTAYAM



CERTIFICATE

This is to certify that the summer internship report the outcome of the original study carried out at United Electrical Industries Ltd, Kollam by Vyshakh P.B (Reg. No MLM19MBA90). Third trimester MBA student of this institution in partial fulfilment of the requirement of the degree of Master of Business Administration of Dr A P J. Abdul Kalam Technological University Thiruvananthapuram, under the guidance of Mrs. FATHIMA SHIRIN SHAJI, Assistant professor, Mangalam College Of Engineering, Ettumanoor, Kottayam.

Faculty Guide

Ms. FATHIMA SHIRIN SHAJI
Assistant Professor
Department of Management Studies,
Mangalam College of Engineering,
Ettumanoor, Kottayam

Dean

Prof. JOHN V. ARULMANI
Dean, Department of Management Studies,
Mangalam College of Engineering,
Ettumanoor, Kottayam

Professor and Head

DR. SIBUC CHITHRAN
MBA, M.Phil, B.P.U.M.A. (Production),
Prof. & Head, Dept. of Management Studies,
Mangalam College Of Engineering,
Ettumanoor, Kottayam

PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

DEPARTMENT OF MANAGEMENT STUDIES
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR
KOTTAYAM



CERTIFICATE

This is to certificate that the summer internship entitled report the outcome of the original study carried out at **ALLIED COATING INDUSTRY, Ernakulam** by **SARITHA SURESH (Reg. No: MLM19MBA73)**. Third trimester MBA student of the institution in partial fulfillment of the requirement of the degree of Master of Business Administration of A.P.J Abdul Kalam Technological University Thiruvananthapuram, under the guidance of Mrs. **JEENU MATHEW** Assistant Professor, Department of Management Studies, Mangalam College of Engineering Ettumanoor, Kottayam.

Jeenu Mathew
Faculty Guide

Ms. JEENU MATHEW
Assistant Professor
Department of Management Studies
Mangalam College of Engineering
Ettumanoor, Kottayam



Sibu C Chithran
Head of Department

DR. SIBU C CHITHRAN
MBA, M.Phil (PPM&M), PhD (Mgmt)
Prof. & Head, Dept. of Management Studies
Mangalam College Of Engineering
Ettumanoor, Kottayam

John T. Varuchese
DEAN OF THE DEPARTMENT

Prof. JOHN T. VARUCHESE
Dean, Department of Management Studies,
Mangalam College of Engineering
Ettumanoor, Kottayam

[Signature]

PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

DEPARTMENT OF MANAGEMENT STUDIES
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR

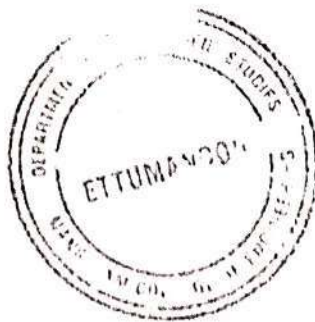


CERTIFICATE

This is to certify that this mini project is a bonafide record of the work done by **Mrs.ATHIRA SATHEESH** as a part of the mini project work during the Fifth Trimester in a partial fulfilment of the requirement for the award of the degree of **MASTER OF BUSINESS ADMINISTRATION** in APJ Abdul Kalam Technological University.

Faculty Guide

Mrs. DEBY DEVASSY
Assistant Professor
Department of Management Studies
Mangalam College of Engineering
Ettumanoor, Kottayam



Head of the Department

DR. SIBIN C. CHITHRAM
MBA, M.Phil, PhD (MKTG) (Mgmt)
Prof. & Head, Dept. of Management Studies
Mangalam College Of Engineering
Ettumanoor, Kottayam

Dean of the Department

Prof. JOHN T. VARDACHESE
Dean, Department of Management Studies,
Mangalam College of Engineering
Ettumanoor, Kottayam

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MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

DEPARTMENT OF MANAGEMENT STUDIES
MANGALAM COLLEGE OF ENGINEERING
ETTUMANOOR, KOTTAYAM




CERTIFICATE

This is to certify that mini project entitled 'A STUDY ON EMPLOYEE JOB SATISFACTION WITH REFERENCE TO MILMA' is a bonafide record of the work by Mr. ANOOP M PILLAI as a part of the project work during the Fifth Trimester in partial fulfillment of the requirements for the award of the Degree of MASTER OF BUSINESS ADMINISTRATION (MBA) OF Dr. APJ Abdul Kalam Technological University.




Project Guide

Mrs. DEMY DEVASSY
Assistant Professor
Department of Management Studies
Mangalam College of Engineering
Ettumanoor, Kottayam


Dean of the Department
Prof. JOHN T. VAIDY NIESE
Dean, Department of Management Studies,
Mangalam College of Engineering
Ettumanoor, Kottayam.


Head of the Department
DR. SIBY C. CHITHRAN
MBA, M.Phil, FDP (MBA), Ph.D (Mgmt)
Prof. & Head, Dept. of Management Studies
Mangalam College Of Engineering
Ettumanoor, Kottayam

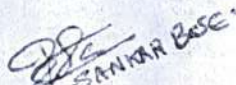

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MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

**DEPARTMENT OF CIVIL ENGINEERING MANGALAM
COLLEGE OF ENGINEERING, ETTUMANOOR**



CERTIFICATE

This is to certify that the report entitled "DESIGN OPTIMIZATION OF X-BRACING USING SAP2000" submitted by "PRIYA VENUGOPAL, REVATHY PARAMESWARAN, WILFRED JAMES, SRUTHY K P," to the APJ Abdul Kalam Technological University in partial fulfilment of the requirements for the award of the Degree of Bachelor of Technology in Civil Engineering is a bonafide record of the project work carried out by her under my/our guidance and supervision. This report in any form has not been submitted to any other University or Institute for any purpose.


Internal Supervisor(s)

External Supervisor(s)

UG Coordinator

Dr. D RAMESH KUMAR

HEAD OF THE DEPT.


MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

DEPARTMENT OF CIVIL ENGINEERING
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR



CERTIFICATE

This is to certify that the report entitled "ANALYSIS OF BUILDING WITH BASE ISOLATION AND DAMPER USING ETABS" submitted by " SARAH MARIAM ABRAHAM, K S SELMAN , NITHYA MOHAN, SHUNMU PRASAD" to the APJ Abdul Kalam Technological University in partial fulfillment of the requirements for the award of the Degree of Bachelor of Technology in Civil Engineering is a bonafide record of the project work carried out by her under my/our guidance and supervision.. This report in any form has not been submitted to any other University or Institute for any purpose.

Salini Theres N Kurian

Assistant Professor

Guide

Aswathy Soman

Assistant Professor

Project Coordinator

MANGALAM COLLEGE OF ENGINEERING
ETTUMANOOR

Dr. D. Rameshkumar

Head of Department

DEPARTMENT OF CIVIL ENGINEERING
MANGALAM COLLEGE OF ENGINEERING,
ETTUMANOOR



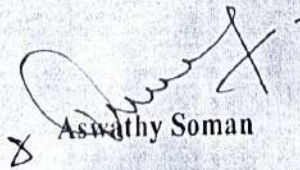
CERTIFICATE

This is to certify that the report entitled "IMPACT OF HEAVY VEHICLES ON HIGHWAY TRAFFIC FLOW" is the authentic record of the project presented by ARJUN NV, NEENU VIJAYAN, SWATHY ER, TIMOTHY NINAN THOMAS in partial fulfilment of the requirements for the award of BACHELOR OF TECHNOLOGY in CIVIL ENGINEERING of APJ Abdul Kalam Technological University. The contents of the report, in full or in parts, have not been submitted to any other University for the award of any degree.



Vaishnav VK

Assistant Professor
Guide



Aswathy Soman

Assistant Professor
Project Coordinator


MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

Dr. D. Ramesh Kumar

Head of Department

DEPARTMENT OF CIVIL ENGINEERING

MANGALAM COLLEGE OF ENGINEERING,

ETTUMANOOR



CERTIFICATE

This is to certify that the report entitled "IDENTIFICATION OF BLACKSPOTS ON NATIONAL HIGHWAY 183 USING GIS (KOTTAYAM TO KANJIRAPPALLY)" is the authentic record of the project presented by J ANAND SHANKAR, MERRIN JOSE, SAIFA NOUFAL, SREEHARI S in partial fulfilment of the requirements for the award of BACHELOR OF TECHNOLOGY in CIVIL ENGINEERING of the APJ Abdul Kalam Technological University. The contents of the report, in full or in parts have not been submitted to any other University for the award of any degree.

Smruthy P Nair

Assistant Professor

Guide

Aswathy Soman

Assistant Professor

Project Coordinator

PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
ETTUMANOOR

Dr. Ramesh Kumar

Head of Department

DEPARTMENT OF CIVIL ENGINEERING
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR



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CERTIFICATE

This is to certify that the report entitled "STUDY ON THE EFFECTS OF MARINE CLAY STABILIZED WITH BANANA FIBRE" submitted by "SARA MOHAMMED, ROHINI S, YADHU KRISHNAN KM," to the APJ Abdul Kalam Technological University in partial fulfilment of the requirements for the award of the Degree of Bachelor of Technology in Civil Engineering is a bonafide record of the project work carried out by her under my/our guidance and supervision.. This report in any form has not been submitted to any other University or Institute for any purpose.

Sreerench Raghavu

Assistant professor

Guide

Aswathy Soman

Assistant Professor

Project Coordinator

Dr. D. Ramesh Kumar

Head Of Department

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MANGALAM COLLEGE OF ENGINEERING
ETTUMANOOR

DEPARTMENT OF CIVIL ENGINEERING
MANGALAM COLLEGE OF ENGINEERING,
ETTUMANOOR





CERTIFICATE


This is to certify that the report entitled "*STABILIZATION OF EXPANSIVE KUTTANAD CLAY USING GROUND GRANULATED BLAST FURNACE SLAG*" is the authentic record of the project presented by "*FATHIMA M, JITHU ABRAHAM JAMES, NANDHU PRADEEP M, SNEHA PUNNOOSE*" in partial fulfilment of the requirements for the award of *DEGREE OF BACHELOR OF TECHNOLOGY* in *CIVIL ENGINEERING* of APJ Abdul Kalam Technological University. The content of the report in full or in any parts have not been submitted to any other University for the award of any degree.


Linu Joy

Assistant Professor
Guide


Aswathy Soman
Assistant Professor
Project Coordinator


Dr. D. Ramesh Kumar
Head of Department


MANGALAM COLLEGE OF ENGINEERING
ETTUMANOOR

DEPARTMENT OF CIVIL ENGINEERING
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR



CERTIFICATE

This is to certify that the report entitled "ANALYSIS OF IRREGULAR BUILDING WITH GRID SLAB USING ETABS" is the authentic record of the project presented by "JERIN MATHEW JOSE, KESIYA JOSY V, LIKHITH KORUTHE VARGHESE, NAYANA P P" in partial fulfilment of the requirements for the award of BACHELOR OF TECHNOLOGY in CIVIL ENGINEERING of APJ Abdul Kalam Technological University. The content of the report, in full or in parts, have not been submitted to any other University for the award of any degree.

Adhithya Vishwambaran
Assistant professor
Guide

Aswathy Soman
Assistant Professor
Project Coordinator

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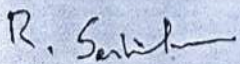
D.R. Remesh Kumar
Head of Department

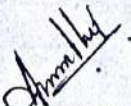
DEPARTMENT OF CIVIL ENGINEERING
MANGALAM COLLEGE OF ENGINEERING,
ETTUMANOOR



CERTIFICATE

This is to certify that the report entitled "ANALYSIS OF POLLUTION TRENDS IN SUBSURFACE WATER AT POOVANTHURUTH, KOTTAYAM" submitted by "JETCY ELIZABETH PHILIP, KAVYA PRAKASH, KELVIN JIMS, LIBIN JOSEPH" to the APJ Abdul Kalam Technological University in partial fulfillment of the requirements for the award of the Degree of Bachelor of Technology in Civil Engineering is a bonafide record of the project work carried out by her under my/our guidance and supervision.. This report in any form has not been submitted to any other University or Institute for any purpose.


Dr. R Senthil Kumar
Associate Professor
Guide


Aswathy Soman
Assistant Professor
Project Coordinator


PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
ETTUMANOOR
Dr. D Rameshkumar
Head of Department

DEPARTMENT OF CIVIL ENGINEERING
MANGALAM COLLEGE OF ENGINEERING,
ETTUMANOOR



CERTIFICATE

This is to certify that the report entitled "ELUCIDATION OF TRAFFIC CONGESTION AT ETTUMANOOR INTERSECTION" is the authentic record of the project presented by "PRAJITHA PRAKASH , PRANAV V P , THOMAS SIBY , SANDHYA S " in partial fulfillment of the requirements for the award of BACHELOR OF TECHNOLOGY in CIVIL ENGINEERING of APJ Abdul Kalam Technological University. The contents of the report, in full or in parts, have not been submitted to any other University for the award of any degree.

Anjana Baby

Assistant Professor

Guide

Aswathy Soman

Assistant Professor

Project Coordinator

Dr. D. Rameshkumar

Head of Department

DEPARTMENT OF CIVIL ENGINEERING
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR.



CERTIFICATE

This is to certify that the report entitled "A STUDY ON BEHAVIOUR OF POST-TENSIONED CONCRETE FLOORS" is the authentic record of the seminar presented by ASWIN S NAIR in partial fulfillment of the requirements for the award of MASTER OF TECHNOLOGY in CIVIL ENGINEERING of A.P.J. Abdul Kalam Technological University. The contents of the report, in full or in parts, have not been submitted to any other University for the award of any degree.

SALINI THERES N KURIAN

Assistant Professor

(Guide)

ASWATHY SOMAN

Assistant Professor

(Project Coordinator)

Dr. D Ramesh Kumar

Professor

(Head of the Department)

PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
ETTUMANOOR

DEPARTMENT OF CIVIL ENGINEERING
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR.



CERTIFICATE

This is to certify that the report entitled "BALLASTLESS TRACK" is the authentic record of the seminar presented by KEVIN KURUVILA in partial fulfillment of the requirements for the award of MASTER OF TECHNOLOGY in CIVIL ENGINEERING of A.P.J. Abdul Kalam Technological University. The contents of the report, in full or in parts, have not been submitted to any other University for the award of any degree.

ADITHYA V

Assistant Professor

(Guide)

ASWATHY SOMAN

Assistant Professor

(Seminar Coordinator)

PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
ETTUMANOOR

Dr. RAMESH KUMAR

Professor

(Head of the Department)

DEPARTMENT OF CIVIL ENGINEERING
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR.



CERTIFICATE

This is to certify that the report entitled "A STUDY ON BEHAVIOUR OF POST-TENSIONED CONCRETE FLOORS" is the authentic record of the seminar presented by ASWIN S NAIR in partial fulfillment of the requirements for the award of MASTER OF TECHNOLOGY in CIVIL ENGINEERING of A.P.J. Abdul Kalam Technological University. The contents of the report, in full or in parts, have not been submitted to any other University for the award of any degree.

SALINI THERES N KURIAN

ASWATHY SOMAN

Dr. D Ramesh kumar

Assistant Professor


Assistant Professor

Professor

(Guide)

(Project Coordinator)

(Head of the Department)


PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
ETTUMANOOR

DEPARTMENT OF CIVIL ENGINEERING
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR.



CERTIFICATE

This is to *certify* that the report entitled "*INTEGRAL ABUTMENT BRIDGES*" is the authentic record of the seminar performed **MEBIN MATHEW**, in partial fulfillment of the requirements for the award of *MASTER OF TECHNOLOGY in CIVIL ENGINEERING of A.P.J. Abdul Kalam Technological University*. The contents of the report, in full or in parts, have not been submitted to any other University for the award of any degree.

Athulya Tom,
Assistant Professor
(Guide)

Aswathy Soman,
Assistant Professor
(Seminar Coordinator)

PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

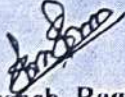
Dr.D.Ramesh Kumar,
Professor
(Head of the Department)

DEPARTMENT OF CIVIL ENGINEERING
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR.




CERTIFICATE

This is to certify that the report entitled "HEMPCRETE " is the authentic record of the seminar presented by KESIYA JOSY V, in partial fulfilment of the requirements for the award of BACHELOR OF TECHNOLOGY in CIVIL ENGINEERING of APJ Abdul Kalam Technological University. The contents of the report, in full or in parts, have not been submitted to any other University for the award of any degree.


Sreerenu Raghav
Assistant professor
(Guide).

Sharon Treassa Biju
Assistant professor.
(Seminar Coordinator).


Dr. D Rameshkumar
Head of Department

PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING

DEPARTMENT OF CIVIL ENGINEERING

MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR.



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CERTIFICATE

This is to *certify* that the report entitled "*LOW COST HOUSE CONSTRUCTION USING GFRG-GLASS FIBRE REINFORCED GYPSUM PANELS*" is the authentic record of the seminar performed **AMITH M.M**, in partial fulfillment of the requirements for the award of *MASTER OF TECHNOLOGY in CIVIL ENGINEERING of A.P.J. Abdul Kalam Technological University*. The contents of the report, in full or in parts, have not been submitted to any other University for the award of any degree.


PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING



Aswathy Soman,
Assistant Professor
(Guide)



Aswathy Soman,
Assistant Professor
(Seminar Coordinator)

Dr.D.Ramesh Kumar,
Professor
(Head of the Department)

DEPARTMENT OF CIVIL ENGINEERING
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR.



CERTIFICATE

This is to certify that the report entitled "ENVIRONMENTAL IMPACT ON RAIL CONSTRUCTION" is the authentic record of the seminar presented by Revathy Parameswaran, in partial fulfilment of the requirements for the award of BACHELOR OF TECHNOLOGY in CIVIL ENGINEERING of APJ Abdul Kalam Technological University. The contents of the report, in full or in parts, have not been submitted to any other University for the award of any degree.

Milbin Varghese
Assistant Professor.
(Guide)

Sharon Treassa Biju
Assistant Professor.
(Seminar Coordinator)

PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
ETTUMANOOR

Dr.D. Rameshkumar
Head of Department

DEPARTMENT OF CIVIL ENGINEERING
MANGALAM COLLEGE OF ENGINEERING,
ETTUMANOOR



CERTIFICATE

This is to certify that the report entitled "NANO CLAY STABILIZED SOIL" is the authentic record of the seminar performed by RAHNA SAJEEB, in partial fulfillment of the requirements for the award of MASTER OF TECHNOLOGY in STRUCTURAL ENGINEERING AND CONSTRUCTION MANAGEMENT of APJ Abdul Kalam Technological University. The contents of the report, in full or in parts, have not been submitted to any other University for the award of any degree.

Mrs Reni kuruvila
Assistant Professor
(Guide)

Mrs Aswathy Soman
Assistant Professor
(Seminar Coordinator)

PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
ETTUMANOOR

Dr. Ramesh kumar
Professor
(Head of the Department)

DEPARTMENT OF CIVIL ENGINEERING
MANGALAM COLLEGE OF ENGINEERING,
ETTUMANOOR



CERTIFICATE

This is to certify that the report entitled "NANO CLAY STABILIZED SOIL" is the authentic record of the seminar performed by RAHNA SAJEEB, in partial fulfillment of the requirements for the award of MASTER OF TECHNOLOGY in STRUCTURAL ENGINEERING AND CONSTRUCTION MANAGEMENT of APJ Abdul Kalam Technological University. The contents of the report, in full or in parts, have not been submitted to any other University for the award of any degree.

Mrs Reni kuruvila
Assistant Professor
(Guide)

Mrs Aswathy Soman
Assistant Professor
(Seminar Coordinator)

PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
ETTUMANOOR

Dr. Ramesh Kumar
Professor
(Head of the Department)

DEPARTMENT OF CIVIL ENGINEERING
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR.



CERTIFICATE

This is to certify that the report entitled "BALLASTLESS TRACK" is the authentic record of the seminar presented by KEVIN KURUVILA in partial fulfillment of the requirements for the award of MASTER OF TECHNOLOGY in CIVIL ENGINEERING of A.P.J. Abdul Kalam Technological University. The contents of the report, in full or in parts, have not been submitted to any other University for the award of any degree.

ADITHYA V

Assistant Professor

(Guide)

ASWATHY SOMAN

Assistant Professor

(Seminar Coordinator)

Dr. RAMESH KUMAR

Professor

(Head of the Department)


PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING


DEPARTMENT OF CIVIL ENGINEERING
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR.



CERTIFICATE

This is to *certify* that the report entitled "*LOW COST HOUSE CONSTRUCTION USING GFRG-GLASS FIBRE REINFORCED GYPSUM PANELS*" is the authentic record of the seminar performed **AMITH M.M**, in partial fulfillment of the requirements for the award of *MASTER OF TECHNOLOGY in CIVIL ENGINEERING* of *A.P.J. Abdul Kalam Technological University*. The contents of the report, in full or in parts, have not been submitted to any other University for the award of any degree.


Aswathy Soman,
Assistant Professor
(Guide)


Aswathy Soman,
Assistant Professor
(Seminar Coordinator)


PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

Dr.D.Ramesh Kumar,
Professor
(Head of the Department)

DEPARTMENT OF CIVIL ENGINEERING
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR.



CERTIFICATE

This is to *certify* that the report entitled "*INTEGRAL ABUTMENT BRIDGES*" is the authentic record of the seminar performed **MEBIN MATHEW**, in partial fulfillment of the requirements for the award of *MASTER OF TECHNOLOGY in CIVIL ENGINEERING of A.P.J. Abdul Kalam Technological University*. The contents of the report, in full or in parts, have not been submitted to any other University for the award of any degree.



Athulya Tom,
Assistant Professor
(Guide)



Aswathy Soman,
Assistant Professor
(Seminar Coordinator)


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Ettumanoor

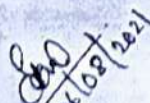
Dr.D.Ramesh Kumar,
Professor
(Head of the Department)

DEPARTMENT OF CIVIL ENGINEERING
MANGALAM COLLEGE OF ENGINEERING,
ETTUMANOOR




CERTIFICATE

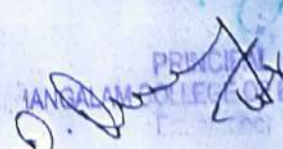
This is to certify that the report entitled "THERMAL STRESS ANALYSIS OF PLATES IN ANSYS" submitted by ANJU KS, MIDHUN P, PRASANTH NP, SANDRA S," to the APJ Abdul Kalam Technological University in partial fulfillment of the requirements for the award of the Degree of Bachelor of Technology in Civil Engineering is a bonafide record of the project work carried out by her under my/our guidance and supervision. This report in any form has not been submitted to any other University or Institute for any purpose.


Gokul P V

Assistant Professor
Guide


Aswathy Soman

Assistant Professor
Project Coordinator


Dr. D. Rameshkumar
Head Of Department


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DEPARTMENT OF CIVIL ENGINEERING
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR.




CERTIFICATE

This is to certify that the report entitled "EFFECT OF MARINE CLAY ON FOUNDRY SAND AS AN ALTERNATE MATERIAL FOR SUBGRADE" is submitted by APARNA K JAYAPRAKASH, to the APJ Abdul Kalam Technological University in partial fulfillment of the requirements for the award of the Degree of Bachelor of Technology in Civil Engineering is a bonafide record of the project work carried out by her under my/our guidance and supervision. This report in any form has not been submitted to any other University or Institute for any purpose.


Dr. Senthil Kumar
Associate Professor
(Guide)


Mr. Vilbin Varghese
Assistant Professor
(Project Coordinator)


Dr. D. Ramesh Kumar
Head of Department

DEPARTMENT OF CIVIL ENGINEERING
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR.



CERTIFICATE

This is to certify that the report entitled "EFFECT OF MARINE CLAY ON FOUNDRY SAND AS AN ALTERNATE MATERIAL FOR SUBGRADE" is submitted by AJMAL NAZEER, to the APJ Abdul Kalam Technological University in partial fulfillment of the requirements for the award of the Degree of Bachelor of Technology in Civil Engineering is a bonafide record of the project work carried out by he under my/our guidance and supervision. This report in any form has not been submitted to any other University or Institute for any purpose.

Dr. Senthil Kumar
Associate Professor
(Guide)

Mr. Vilbin Varghese
Assistant Professor
(Project Coordinator)

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ETTUMANOOR

Dr. D. Ramesh Kumar
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DEPARTMENT OF CIVIL ENGINEERING
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR.



CERTIFICATE

This is to certify that the report entitled "WASTE WATER TREATMENT BY NATURAL COAGULANTS" is the authentic record of the project presented by AMRUTA MURALI in partial fulfilment of the requirements for the award of BACHELOR OF TECHNOLOGY in CIVIL ENGINEERING of APJ Abdul Kalam Technological University. The contents of the report, in full or in parts, have not been submitted to any other University for the award of any degree.

Vilbin Varghese,
Assistant Professor,
(Guide)

Vilbin Varghese
Assistant Professor,
(Seminar Coordinator)

Dr.D.Rameshkumar
Head of Department

DEPARTMENT OF CIVIL ENGINEERING
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR



CERTIFICATE

This is to certify that the report entitled "PERFORMANCE EVALUATION AND IMPROVEMENTS TO PALA CIVIL STATION JUNCTION" submitted by "AGAJA G" to the APJ Abdul Kalam Technological University in partial fulfilment of the requirements for the award of the Degree of Bachelor of Technology in Civil Engineering is a bonafide record of the project work carried out by her under my/our guidance and supervision. This report in any form has not been submitted to any other University or Institute for any purpose.

Sreerench Raghavu
Assistant Professor
Guide

Vilbin Varghese
Assistant Professor
Project Coordinator

Dr.D. Rameshkumar
Head of Department

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MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR.



CERTIFICATE

This is to certify that the report entitled "IMPROVEMENT OF STRENGTH OF SOIL IN KUTTANAD BY BEVERAGE CAN AND LIME" is submitted by ALFY ASHRAF, to the APJ Abdul Kalam Technological University in partial fulfillment of the requirements for the award of the Degree of Bachelor of Technology in Civil Engineering is a bonafide record of the project work carried out by her under my/our guidance and supervision. This report in any form has not been submitted to any other University or Institute for any purpose.

Mrs. Aswathy Soman
Assistant Professor.
(Guide)

Mr. Vilbin Varghese
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Dr. D. Ramesh Kumar
Head of Department


DEPARTMENT OF CIVIL ENGINEERING
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR.




CERTIFICATE

This is to certify that the report entitled "**DESIGN, MODELLING AND ESTIMATION OF POLYTECHNIC BUILDING IN MANGALAM CAMPUS**" is the authentic record of the seminar presented by **FEBIN ANTONY**, to the APJ Abdul Kalam Technological University in partial fulfilment of the requirements for the award of the Degree of Bachelor of Technology in Civil Engineering is a bonafide record of the project work carried out by them under my/our **GUIDANCE AND SUPERVISION**. This report in any form has not been submitted to any other University or Institute for any purpose.


Ann mary jose
Assistant professor
(Guide)


Vilbin vargeese
Assistant Professor.
Project coordinator


Dr.D. Rameshkumar
Head of Department

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CERTIFICATE

This is to certify that the report entitled "**DESIGN, MODELLING AND ESTIMATION OF POLYTECHNIC BUILDING IN MANGALAM CAMPUS**" is the authentic record of the seminar presented by **AGNESIA IHNESIOUS**, to the APJ Abdul Kalam Technological University in partial fulfilment of the requirements for the award of the Degree of Bachelor of Technology in Civil Engineering is a bonafide record of the project work carried out by them under my/ our **GUIDENCE AND SUPERVISION**. This report in any form has not been submitted to any other University or Institute for any purpose.

Ann mary jose
Assistant professor
(Guide)

Vilbin vargeese
Assistant Professor,
Project coordinator

Dr.D. Rameshkumar
Head of Department

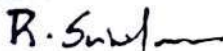
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MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR.





CERTIFICATE

This is to certify that the report entitled "EFFECT OF MARINE CLAY ON FOUNDRY SAND AS AN ALTERNATE MATERIAL FOR SUBGRADE" is submitted by AJMAL NAZEER, ALEN JOSE, APARNA K JAYAPRAKASH and RAHANA MURUKESH, to the APJ Abdul Kalam Technological University in partial fulfillment of the requirements for the award of the Degree of Bachelor of Technology in Civil Engineering is a bonafide record of the project work carried out by her under my/our guidance and supervision.. This report in any form has not been submitted to any other University or Institute for any purpose.


Dr. Senthil Kumar
Associate Professor
(Guide)


Mr. Vilbin Varghese
Assistant Professor
(Project Coordinator)



Dr. D. Ramesh Kumar
Head of Department

DEPARTMENT OF CIVIL ENGINEERING
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CERTIFICATE

This is to certify that the report entitled "**DESIGN, MODELLING AND ESTIMATION OF POLYTECHNIC BUILDING IN MANGALAM CAMPUS**" is the authentic record of the seminar presented by **AVANI V**, to the APJ Abdul Kalam Technological University in partial fulfilment of the requirements for the award of the Degree of Bachelor of Technology in Civil Engineering is a bonafide record of the project work carried out by them under my/our **GUIDANCE AND SUPERVISION**. This report in any form has not been submitted to any other University or Institute for any purpose.

Ann Mary Jose
Assistant professor
(Guide)

Vilbin Vargese
Assistant Professor.
Project coordinator

Dr. D. Rameshkumar
Head of Department

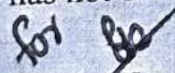
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MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR.



CERTIFICATE

This is to certify that the report entitled "INTEGRATED SOLID WASTE MANAGEMENT PLAN FOR PALA MUNICIPALITY OF KERALA" submitted by **K S KARTHIK**, to the APJ Abdul Kalam Technological University in partial fulfilment of the requirements for the award of the Degree of Bachelor of Technology in Civil Engineering is a bonafide record of the project work carried out by them under my/ our GUIDANCE AND SUPERVISION. This report in any form has not been submitted to any other University or Institute for any purpose.


Mr. Vilbin Varghese

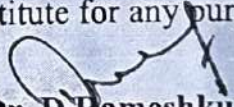
Assistant Professor

Guide


Mr. Vilbin Varghese

Assistant Professor

Project Coordinator


Dr. D. Rameshkumar

Head of Department



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MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR.





CERTIFICATE

This is to certify that the report entitled "EFFECT OF MARINE CLAY ON FOUNDRY SAND AS AN ALTERNATE MATERIAL FOR SUBGRADE" is submitted by ALEN JOSE, to the APJ Abdul Kalam Technological University in partial fulfillment of the requirements for the award of the Degree of Bachelor of Technology in Civil Engineering is a bonafide record of the project work carried out by he under my/our guidance and supervision. This report in any form has not been submitted to any other University or Institute for any purpose.


Dr. Senthil Kumar
Associate Professor
(Guide)


Mr. Vilbin Varghese
Assistant Professor
(Project Coordinator)


Dr. D. Ramesh Kumar
Head of Department



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MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR.



CERTIFICATE

This is to certify that the report entitled " NUMERICAL ANALYSIS OF THIN PLATES USING FINITE ELEMENT SOFTWARE " is the authentic record of the seminar presented by ARJUN PRASAD & GOVIND SHAJI, in partial fulfilment of the requirements for the award of BACHELOR OF TECHNOLOGY in CIVIL ENGINEERING of APJ Abdul Kalam Technological University. The contents of the report, in full or in parts, have not been submitted to any other University for the award of any degree.


Gokul P V,
Assistant Professor
Guide


Vilbin Varghese
Assistant Professor
Project Coordinator


MANGALAM COLLEGE OF ENGINEERING
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Dr.D. Rameshkumar
Head of Department

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CERTIFICATE

This is to certify that the report entitled "DESIGN, MODELLING AND ESTIMATION OF POLYTECHNIC BUILDING IN MANGALAM CAMPUS" is the authentic record of the seminar presented by FEBIN ANTONY, AVANI V, AGNESHIA IHNESIOUS, AJAI P A, to the APJ Abdul Kalam Technological University in partial fulfilment of the requirements for the award of the Degree of Bachelor of Technology in Civil Engineering is a bonafide record of the project work carried out by them under my/ our GUIDANCE AND SUPERVISION. This report in any form has not been submitted to any other University or Institute for any purpose.

Ann Mary Jose
Assistant professor
(Guide)

Vilbin Vargese
Assistant Professor.
Project coordinator

MANGALAM COLLEGE OF ENGINEERING
PRINCIPAL

Dr. D. Rameshkumar
Head of Department

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CERTIFICATE

This is to certify that the report entitled "EFFECT OF MARINE CLAY ON FOUNDRY SAND AS AN ALTERNATE MATERIAL FOR SUBGRADE" is submitted by RAHANA MURUKESH, to the APJ Abdul Kalam Technological University in partial fulfillment of the requirements for the award of the Degree of Bachelor of Technology in Civil Engineering is a bonafide record of the project work carried out by her under my/our guidance and supervision. This report in any form has not been submitted to any other University or Institute for any purpose.

Dr. Senthil Kumar
Associate Professor
(Guide)

Mr. Vilbin Varghese
Assistant Professor
(Project Coordinator)

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MANGALAM COLLEGE OF ENGINEERING

Dr. D. Ramesh Kumar
Head of Department

**MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**



CERTIFICATE

This is to certify that the project report titled "ACCIDENT SEVERITY DETECTION FOR PTW USING MACHINE LEARNING" is the Bonafide record of the work done by Brincy Kuriakose (MLM176CS021), Jezina Shahul Hameed (MLM17CS027), Jincy Mariyamma Shaji (MLM17CS028), Kavyamol James (MLM17CS038) of B.Tech in Computer Science and Engineering towards the partial fulfillment of the requirement for the award of the DEGREE OF BACHELORS OF TECHNOLOGY IN COMPUTER SCIENCE AND ENGINEERING BY APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, during the academic year 2020-2021.

Internal Guide

Ms. Jinu P Sainudeen
Assistant Professor
Dept. of Computer Science

Head of the Department

Dr. Sunitha E V
Associate Professor & HOD
Dept. of Computer Science


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MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR

MAY 2021



CERTIFICATE

This is to certify that the project titled "MUSIC GENRE CLASSIFICATION" is the bonafide record of the work done by AARCHAMOL A.V-MLM17CS001, ANN MARY FRANCIS-MLM17CS012, KAREN SHERRY CHANDY-MLM17CS036 , KAVYA JAYAKUMAR-MLM17CS037 of B.Tech in Computer Science and Engineering towards the partial fulfillment of the requirement for the award of the DEGREE OF BACHELOR OF TECHNOLOGY by APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, Kottayam during the academic year 2020-2021.

Internal guide

Ms. Sreenimol K R

Associate Professor

Dept of CSE

Head of the department

Dr. Sunitha E V

Professor & H O D

Dept of CSE

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING



CERTIFICATE

This is to certify that the report entitled “**ADMISSION IN HOSPITAL EMERGENCY DEPARTMENT**”, submitted by **Akshaya P(MLM17CS004), Anandu B Nair(MLM17CS006), Jathin Jayakumar(MLM17CS026) , Solja Mariya Sunny(CML17CS048)** to the APJ Abdul Kalam Technological University in partial fulfillment of the requirements for the award of the Degree of Bachelor of Technology in Computer Science and Engineering is a bonafide record of the project work carried out by him/her under my/our guidance and supervision. This report in any form has not been submitted to any other University or Institute for any purpose.

Internal Supervisor

Ms. Jayakrishnan B

Assistant Professor

Dept. of Computer Science

UG Coordinator

Ms. Jinu P Sainudeen

Assistant Professor

Dept. of Computer Science

External Supervisor

Head of the Dept.

Dr. Sunitha E V

Associate Professor & HOD

Dept. of Computer Science

MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING



CERTIFICATE

This is to certify that the report entitled "SHIP CLASSIFICATION FROM SAR IMAGES USING DEEP LEARNING", submitted by Aswathy M N (MLM17CS019), Anitt Sunny (MLM17CS009), Ashik Kishor (MLM17CS017), Dani K Baby (MLM17CS023) in partial fulfilment for the award of degree of Bachelor of Technology in Computer Science and Engineering under APJ Abdul Kalam Technological University during the year 2020-2021, is a bonafide work carried out by him under my guidance and supervision.


Internal Guide

Ms. Sruthy Emmanuel
Assistant Professor
Dept. of CSE


Head of the Dept.

Dr. Sunitha E V
Professor & HOD
Dept. of CSE


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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING



CERTIFICATE

This is to certify that the report entitled “**FINGER KNUCKLE PRINT RECOGNITION SYSTEM**”, submitted by **Asirvad Abraham (MLM17CS018), Abhishek Aravind (MLM16CS003), Devjith Prasad (MLM17CS024), Job Shibu (MLM17CS031), Joseph Thomas (MLM17CS033)** to the APJ Abdul Kalam Technological University in fulfillment of the requirements for the award of the Degree of Bachelor of Technology in Computer Science and Engineering is a bonafide record of the project work carried out by him/her under my/our guidance and supervision.. This report in any form has not been submitted to any other University or Institute for any purpose.

Internal Supervisor

Ms. Jinu P. Sainudeen

Assistant Professor

Dept. of Computer Science

UG Coordinator

Ms. Jinu P Sainudeen

Assistant Professor

Dept. of Computer Science

External Supervisor

Head of the Dept.

Dr. Sunitha E V

Associate Professor &HOD

Dept. of Computer Science

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Sunitha E V

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR

MAY 2021



CERTIFICATE

This is to certify that the seminar titled "Depression Recognition System For College Students" is the bonafide record of the work done by Anna Benny(MLM17CS011), Arya Somaraj(MLM17CS016), Migesh K M(MLM17CS043), Amal Don(BTE17CS002) of B.Tech in Computer Science and Engineering towards the partial fulfillment of the requirement for the award of the DEGREE OF BACHELOR OF TECHNOLOGY by APJ ABDUL KALAM TECHNOLOGICAL UNIVERISTY, Kottayam during the academic year 2020-2021.


(Space for signature)

Internal Guide
Jimsha K Mathew
Assistant Professor
Dept. of Computer Science & Engineering


(Space of signature)

Head of the department
Dr. Sunitha EV
Professor and HOD
Dept. of Computer Science & Engineering

MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING



CERTIFICATE

This is to certify that the report entitled “**Number Plate Based Automatic Document Validity Detection And Renewal Of Vehicle Insurance**”, submitted by **Arjuna Das N M (MLM17CS014), David Sam (CML17CS011), Snehesh Theophine Jose (KVE17CS017), Vishakh P S (KVE17CS021)** to the APJ Abdul Kalam Technological University in partial fulfillment of the requirements for the award of the Degree of Bachelor of Technology in Computer Science and Engineering is a bonafide record of the project work carried out by him/her under my/our guidance and supervision.. This report in any form has not been submitted to any other University or Institute for any purpose.

Internal Supervisor

Dr. Sabu George

Associate Professor

Dept. of Computer Science

UG Coordinator

Ms. Jinu P Samudeen

Assistant Professor

Dept. of Computer Science

External Supervisor

Head of the Dept.

Dr. Sunitha E V

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR

NOVEMBER 2020



CERTIFICATE

This is to certify that the seminar titled “Real Time Face Mask Detection and Recognition Using Python” is the bonafide record of the work done by Roshan M Thomas (MLM17CS056), Tintu Samson(MLM17CS070), Motty Sabu (MLM17CS045), Shihana Mol B (MLM17CS060), of B. Tech in Computer Science and Engineering towards the partial fulfillment of the requirement for the award of the Degree of Bachelor of Technology by APJ Abdul Kalam Technological University, during the academic year 2020-21.

Internal Guide

*Ms. Tinu Thomas
Assistant Professor
Department of CSE, MLMCE*

Head of the Department

*Dr. Sunitha E V
Professor and HOD
Department of CSE, MLMCE*

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR

NOVEMBER 2020



CERTIFICATE

This is to certify that the seminar titled "Voice Based Email Management System Using Python" is the bonafide record of the work done by Gaius B Samuel (CML17CS013) of B. Tech in Computer Science and Engineering towards the partial fulfillment of the requirement for the award of the Degree of Bachelor of Technology by APJ Abdul Kalam Technological University, during the academic year 2020-21.

Internal Guide

Ms. Kavitha Nair R

Assistant Professor

Department of CSE, MLMCE

Head of the Department

Dr. Sunitha E V

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Principal
PRINCIPAL
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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR

JUNE 2021



CERTIFICATE

This is to certify that the project report titled "Automatic Neonatal Pain Detection for Pediatrics Using Convolutional Neural Network" is the bonafide record of the work done by Kripa Rachel Thomas (MLM17CS039), Poorna Sudhakaran (MLM17CS050), Shaldrin Emerson (MLM17CS058), Rahul R (MLM16CS091) of B.Tech in Computer Science and Engineering towards the partial fulfilment of the requirement for the award of the Degree of Bachelor of Technology by APJ Abdul Kalam Technological University, during the academic year 2020-21

Internal Guide

Ms. Simy Mary Kurian
Assistant Professor
Department of CSE, MLMCE

Principal
PRINCIPAL
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Professor & Head
Department of CSE, MLMCE

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MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR

JUNE 2021



CERTIFICATE

This is to certify that the project titled "Emotion Correlation Mining Using Neural Networks" is the bonafide record of the work done by Melvin K Mathew (MLM17CS040), Surya R (MLM17CS068), Roshan Jo (MLM17CS055) of B.Tech in Computer Science and Engineering towards the partial fulfilment of the requirement for the award of the DEGREE OF BACHELOR OF TECHNOLOGY by APJ ABDUL KALAM TECHNOLOGICAL UNIVERISTY, during the academic year 2020-21

Internal Guide

*Ms. Kavitha Nair R
Assistant Professor
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Head of the Department

*Dr. Sunitha E.V
Associate Professor & Head
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Ettumanoor

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR

JUNE 2021



CERTIFICATE

This is to certify that the project report titled "Automated Attendance System Based on Face Recognition & Live Video Processing" is the bonafide record of the work done by Varun Gopinath (MLM17CS073), Rakhi R Nair (MLM17CS053), Meharban (MLM16CS082), Lekshmi Priya M.B (BTE17CS008) of B.Tech in Computer Science and Engineering towards the partial fulfilment of the requirement for the award of the Degree of Bachelor of Technology by APJ Abdul Kalam Technological University, during the academic year 2020-21

Internal Guide

Ms. Divya S.B

Assistant Professor

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Principal
PRINCIPAL
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Head of the Department

Dr. Sunitha E.V

Professor & Head

Department of CSE, MLMCE

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR

JUNE 2021



*This is to certify that the project preliminary titled "Palmprint based biometric identification system" is the bonafide record of the work done by Midhuna Naveen (MLM17CS041), Neethumol K J (MLM17CS047), Pritty Mary Mathew (MLM17CS052), Sherin Joseph (MLM17CS059) of B. Tech in Computer Science and Engineering towards the partial fulfilment of the requirement for the award of the **DEGREE OF BACHELOR OF TECHNOLOGY** by **APJ ABDUL KALAM TECHNOLOGICAL UNIVERISTY**, during the academic year 2020-21*

Internal Guide

Ms. Sujitha M

Assistant Professor

Department of CSE, MLMCE

Principal
PRINCIPAL
MANGALAM COLLEGE OF ENGINEERING
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Dr. Sunitha E. V

Professor & Head

Department of CSE, MLMCE



DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR

JUNE 2021

CERTIFICATE

This is to certify that the project titled "secure peer-to-peer messenger and file sharing over IPV6" is the bonafide record of the work done by Grace Abraham, Ben Shaji and Vidya E S Of B.Tech in Computer Science and Engineering towards the partial fulfillment of the requirement for the award of the DEGREE OF BACHELOR OF TECHNOLOGY by APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, Kottayam during the academic year 2020-2021.

Internal Guide

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JUNE 2021
MANGALAM COLLEGE OF ENGINEERING
Ettumanoor

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR
KOTTAYAM
JUNE 2021



CERTIFICATE

This is to certify that the project titled "DESIGN AND DEVELOPMENT OF AGILE/SCRUM DASHBOARDS" is the Bonafide record of the work done by Jerin Jose Philip (MLM16CS062), Shilpa K Mohanan (MLM17CS061), Surya Babu (MLM17CS067), Zacharia Alexander (MLM17CS078) of B.Tech in Computer Science and Engineering towards the partial fulfillment of the requirement for the award of the DEGREE OF BACHELORS OF TECHNOLOGY IN COMPUTER SCIENCE AND ENGINEERING BY APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY, during the academic year 2020-2021.

Internal Guide

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR

JUNE 2021



CERTIFICATE

This is to certify that the project report titled "Smart Energy Meter" is the bonafide record of the work done by Nithin Thomas (MLM17CS049), Vishnu Vinod (MLM17CS076), Gishwin George (CML17CS014), Rohan Justin (MLM17CS054) of B.Tech in Computer Science and Engineering towards the partial fulfilment of the requirement for the award of the Degree of Bachelor of Technology by APJ Abdul Kalam Technological University, during the academic year 2020-21

Internal Guide

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR

JANUARY 2021



CERTIFICATE

This is to certify that the project preliminary titled "RFID Based Smart Card For Campus Automation" is the bonafide record of the work done by Sreelekshmi .S (MLM17CS066), Preethi Presannan Nair (MLM17CS051), Sajana Saji (MLM17CS057), T S Shabanam (MLM17CS071) of B.Tech in Computer Science and Engineering towards the partial fulfilment of the requirement for the award of the Degree Of Bachelor Of Technology by APJ Abdul Kalam Technological University, during the academic year 2020-21

Internal Guide

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR

JANUARY 2021



CERTIFICATE

This is to certify that the project preliminary titled "Mining High Utility Sequential Pattern Using Lexicographic Q-Sequence Tree And Utility Linked List" is the bonafide record of the work done by Reno Rajan (MLM16CS095), Sreedevi Devaraj (MLM17CS064), Vivek M K (MLM17CS077) of B.Tech in Computer Science and Engineering towards the partial fulfilment of the requirement for the award of the DEGREE OF BACHELOR OF TECHNOLOGY by APJ ABDUL KALAM TECHNOLOGICAL UNIVERISTY, during the academic year 2020-21.



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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR


JANUARY 2021



CERTIFICATE


This is to certify that the project preliminary titled "Wearable Devices to Track Covid-19 Symptoms" is the bonafide record of the work done by Midhun Prasad (MLM17CS042), Susanna Sajan (MLM17CS069), Minza Thazni (MLM17CS044), Saran M.S (BTE15CS028) of B.Tech in Computer Science and Engineering towards the partial fulfilment of the requirement for the award of the DEGREE OF BACHELOR OF TECHNOLOGY by APJ ABDUL KALAM TECHNOLOGICAL UNIVERISTY, during the academic year 2020-21

Internal Guide


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JUNE 2021



CERTIFICATE

*This is to certify that the project titled "Web Based Graphical Password Authentication System" is the bonafide record of the work done by Abhijith S (LMLM17CS079), Soja Sam (BTE17CS012), Sreelekshmi K U (MLM17CS065) and T T Samjeevan (MLM16CS115) of B.Tech in Computer Science and Engineering towards the partial fulfillment of the requirement for the award of the **DEGREE OF BACHELOR OF TECHNOLOGY** by **APJ ABDUL KALAM TECHNOLOGICAL UNIVERISTY**, Thiruvananthapuram during the academic year 2020-21.*

Internal Guide


Ms. Sneha Mathew
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MANGALAM COLLEGE OF ENGINEERING,
KOTTAYAM



विश्वं शास्त्रे प्रतिष्ठितम्।

CERTIFICATE

This is to certify that the report titled "FINANCIAL PERFORMANCE ANALYSIS OF TATA CHEMICALS" is a bonafide record of the work done by ABHILA ELSA SAJI (Reg No: MLM19MBA02) during the sixth trimester in partial fulfilment of the requirements of the degree of MASTER OF BUSINESS ADMINISTRATION of A.P.J Abdul Kalam Technological University (KTU), Thiruvananthapuram, under the guidance of Mrs. JEENU MATHEW, Assistant Professor, Mangalam College of Engineering.



Jeenu Mathew
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CERTIFICATE

This is to certify that the Project Report is a bonafide record of the work done by **ALAN P SHIBU**(Reg No: MLM19MBA09) as part of the project work during the sixth trimester on "A STUDY ON WORKING CAPITAL MANAGEMENT AT TATA STEEL LIMITED MUMBAI", in partial fulfilment of the requirements of the degree of **MASTER OF BUSINESS ADMINISTRATION** of A.P.J Abdul Kalam Technological University (KTU), Thiruvananthapuram, under the guidance of **Ms. JEENU MATHEW**, Associate Professor, Mangalam College of Engineering, Ettumanoor , Kottayam.

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DEPARTMENT OF MANAGEMENT STUDIES
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CERTIFICATE

This is to certify that the Project Report is a bonafide record of the work done by **AMRUTHA SOMAN** (Reg No: MLM19MBA17) as part of the project work during the sixth trimester on "A STUDY ON THE EXISTING PERFORMANCE APPRAISAL SYSTEM IN DHL EXPRESS INDIA Pvt Ltd" in partial fulfilment of the requirements of the degree of **MASTER OF BUSINESS ADMINISTRATION** of A.P.J Abdul Kalam Technological University (KTU), Thiruvananthapuram, under the guidance of **Mr. BOSE TOM**, Associate Professor, Mangalam College of Engineering, Ettumanoor, Kottayam.

Project Guide

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**DEPARTMENT OF MANAGEMENT STUDIES
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CERTIFICATE

This is to certify that major project entitled 'A Study On Working Capital Management at konzept builders' being submitted by Ms. Arya Manoj (MLM19MBA26), in partial fulfilment of the requirements for the award of the Degree of Master of Business Administration, is a bonafide record of the project work done by **ARYA MANOJ** of Department of Management Studies, Mangalam College Of Engineering, Ettumanoor, Kottayam.


Project Guide

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DEPARTMENT OF MANAGEMENT STUDIES
MANGALAM COLLEGE OF ENGINEERING, KOTTAYAM
CERTIFICATE


This is to certify that this Study Report on "CAPITAL BUDGETING & TECHNIQUES AT HDFC BANK" is a bonafide record of the work undertaken by Ms. DIVYA MOHANDAS (Reg. No: MLM19MBA37) as part of mini project work during the 6th trimester of her studies in partial fulfilment of Requirements for the award of the Degree of MASTER OF BUSINESS ADMINISTRATION, of DR.APJ ABDHUL KALAM TECHNOLOGICAL UNIVERSITY, under the guidance of Mrs. JEENU MATHEW, Assistant Professor, Department of Management Studies, Mangalam College of Engineering.


Mrs. Jeenu Mathew

Assistant Professor

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CERTIFICATE

This is to certify that the Project Report is a bonafide record of the work done by **MELGI MARY THOMAS**, (Reg No: MLM19MBA56) as a part of the project work during the sixth trimester on "A STUDY ON EMPLOYEES JOB SATISFACTION AT TRAVANCORE SUGARS AND CHEMICALS LIMITED THIRUVALLA" in partial fulfilment of the requirements of the degree of **MASTER OF BUSINESS ADMINISTRATION** of A.P.J Abdul Kalam technological university (KTU), Thiruvananthapuram, under the guidance of **Mr. BOSE TOM**, Associate Professor , Mangalam College of Engineering, Ettumanoor, Kottayam.


Mr. Bose Tom

Associate Professor

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DEPARTMENT OF MANAGEMENT STUDIES
MANGALAM COLLEGE OF ENGINEERING
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CERTIFICATE

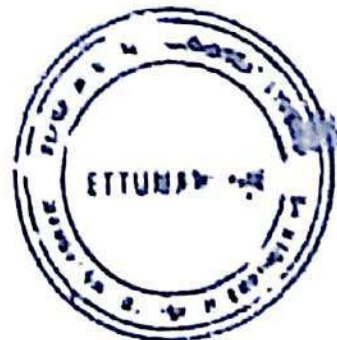
This is to certify that project entitled 'A STUDY ON FINANCIAL ANALYSIS AND PERFORMANCE OF FEDERAL BANK' being submitted by Mr. NITHIN PRATHAPAN (MLM19MBA65), in partial fulfillment of the requirements for the award of the Degree of MASTER OF BUSINESS ADMINISTRATION, is a bona fide record of the project work done by NITHIN PRATHAPAN of Department of Management Studies, Mangalam College Of Engineering, Ettumanoor, Kottayam.


Project Guide


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DEPARTMENT OF MANAGEMENT STUDIES
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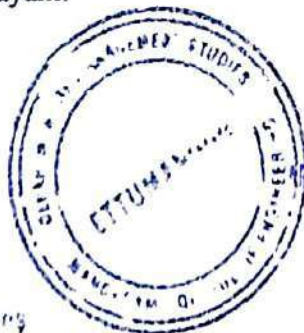
CERTIFICATE

This is to certify that the Report titled "A Study on Non – Performance Asset Management with special reference to Axis Bank" being submitted by Mr. SHYAM SUBHASH (Reg.No: MLM19MBA76), in partial fulfilment of the requirement for the award of the Degree of Master of Business Administration, is a bonafide record of the Project work done by Mr. SHYAM SUBHASH of Department of Management Studies, Mangalam College of Engineering, Ettumanoor, Kottayam.


Faculty Guide

Ms. JENNU MATHIEW
Assistant Professor

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**DEPARTMENT OF MANAGEMENT STUDIES
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CERTIFICATE


This is to certify that "A STUDY ON THE FACTORS AFFECTING PURCHASE DECISION OF CUSTOMERS IN FAVOR OF MTR FOOD PRODUCTS" (MLM19MBA88) as a part of the project work done during Sixth trimester in partial fulfilment of the requirements for the award of the Degree of Master of Business Administration, is a bonafide record of the project work done by VINU CHANDY MATHEW of DEPARTMENT OF MANAGEMENT STUDIES, MANGALAM COLLEGE OF ENGINEERING.


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DEPARTMENT OF MANAGEMENT STUDIES
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CERTIFICATE

This is to certify that the Project report is a bonafide record of the work done by **JAYAKRISHNAN V.K** (Reg. no: MLM19MBA43), as a part of thei Project work during the sixth trimester at "A STUDY ON FINANCIAL PERFORMANCE ANALYSIS AT ASIAN PAINTS LTD" in partial fulfilment of the requirements for the award of the degree of **MASTER OF BUSINESS ADMINISTRATION** of APJ Abdul Kalam Technological University (KTU), Thiruvananthapuram, under guidance of **Mrs.JEENU MATHEW**, Assistant Professor, Mangalam College of Engineering, Ettumanoor, Kottayam.



Faculty Guide

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DEPARTMENT OF MANAGEMENT STUDIES
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CERTIFICATE

This is to certify that the report titled "A STUDY ON WORKING CAPITAL MANAGEMENT IN KELTRON EQUIPMENT COMPLEX,TRIVANDRUM." being submitted to Ms.JEENU MATHEW in partial fulfilment of the requirements for the award of the Degree of Master of Business Administration, is a bonafide record of the project work done by KAVYA MP of Department of Management Studies, Mangalam College of Engineering, Ettumanoor, Kottayam.


Project Guide

Ms. JEENU MATHEW
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Dean of the Department

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DEPARTMENT OF MANAGEMENT STUDIES
MANGALAM COLLEGE OF ENGINEERING KOTTAYAM



CERTIFICATE

It is an honour that the report entitled A STUDY ON FINANCIAL STATEMENT AND ANALYSIS OF STEEL COMPANY LIMITED THROUGH AN ANALYSIS OF 1000 submitted by MR. JAYANATHAN (MURUGANATHAN SRI) in partial fulfillment of the requirements for the award of the degree of BACHELOR OF BUSINESS ADMINISTRATION is a beneficial record of the project work done by the INTERNAL WORK in Department of Management Studies, Mangalam College of Engineering, Kottayam.


Faculty Guide

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DEPARTMENT OF MANAGEMENT STUDIES MANGALAM
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KOTTAYAM



CERTIFICATE

This is to certify that the report titled "A STUDY OF AWARENESS AND ACCEPTANCE LEVEL OF JK CEMENT PRODUCTS AMONG DEALERS" being submitted by MS. POURNAMI PRASAD, Reg No: MLMI9MBA67, sixth Trimester student of this institution in partial fulfilment of the requirements of the award Degree of Master of Business Administration, is bonafide record of the project work done by MS. POURNAMI PRASAD of Department of Management Studies, Mangalam College of Engineering


Faculty Guide

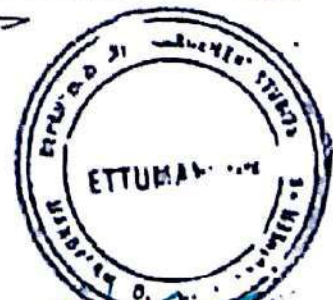

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DEPARTMENT OF MANAGEMENT STUDIES
MANGALAM COLLEGE OF ENGINEERING
ETTUMANOOR, KOTTAYAM



CERTIFICATE

This is to certify that major project entitled titled A STUDY ON QUALITY OF WORKLIFE IN MALAYA MANORAMA COMPANY LIMITED KOTTAYAM being submitted by SARITHA SURESH , MLM19MBA73 in partial fulfilment of the requirements for the award of the Degree of Master of Business Administration, is a bonafide record of the project work done by Saritha suresh of Department of Management Studies, Mangalam College Of Engineering, Ettumanoor, Kottayam.


Project Guide


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DEPARTMENT OF MANAGEMENT STUDIES
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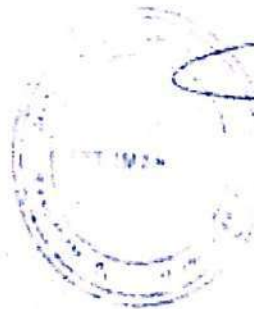


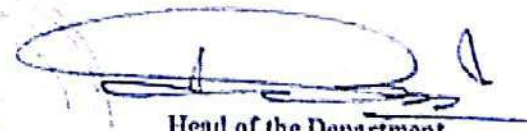
CERTIFICATE

This is to certify that this report entitled "SERVICE QUALITY AND CUSTOMER SATISFACTION UNDERTAKEN AT BIG BAZAAR FUTURE GROUP RETAIL LIMITED" being submitted by UMESH KUMAR A (Reg. No. MLMI9MBA86), sixth trimester MBA student of this institution in partial fulfilment of the requirement of the degree of master of Business Administration of A.P.J Abdul Kalam Technological University(KTU) Thiruvananthapuram is a bonafide record of project done by UMESH KUMAR A under the guidance of DR. SIBY JAMES, ASSOCIATE PROFESSOR, MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR, KOTTAYAM


Faculty Guide

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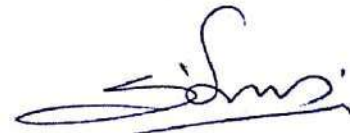
CERTIFICATE

This is to certify that the report titled "CONSUMER PERCEPTION TOWARDS SHOPPING MALL WITH SPECIAL REFERENCE TO COCHIN CITY" being submitted by Mr. ALWIN SHAJI, Reg No: MLM19MBA13, sixth Trimester student of this institution in partial fulfilment of the requirements of the award Degree of Master of Business Administration, is bonafide record of the project work done by Mr. ALWIN SHAJI of Department of Management Studies, Mangalam College of Engineering


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Dean of the Department

Prof. (Dr) JOHN T. VARUGHESE
Dean, Department of Management Studies
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Ettumanoor, Kottayam

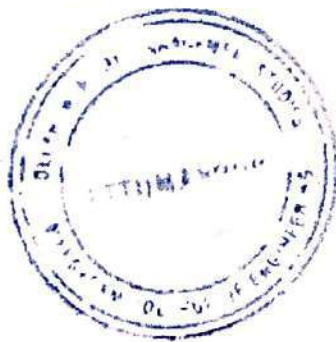


DEPARTMENT OF MANAGEMENT STUDIES
MANGALAM COLLEGE OF ENGINEERING, KOTTAYAM



CERTIFICATE

This is to certify that the Project Report is a bonafide record of the work done by ANJU ANTONY(Reg No: MLM19MBA24) as part of the project work during the sixth trimester on "A STUDY ON FINANCIAL PERFORMANCE ANALYSIS AT KERALA STATE COIR CORPORATION ALAPPUZHA", in partial fulfilment of the requirements of the degree of MASTER OF BUSINESS ADMINISTRATION of A.P.J Abdul Kalam Technological University (KTU), Thiruvananthapuram, under the guidance of Mrs.TINTA BABY, Associate Professor, Mangalam College of Engineering, Ettumanoor, Kottayam.

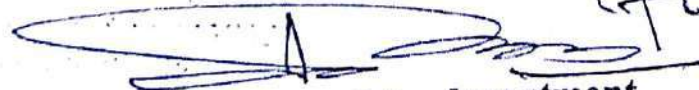



Project Guide




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MANGALAM COLLEGE OF ENGINEERING,
ETTUMANOOR



CERTIFICATE

This is to certify that this project study report entitled "A STUDY ON CUSTOMER SATISFACTION AND EXPERIENCE WITH SPECIAL REFERENCE TO FEDERAL BANK IN IDUKKI DISTRICT" is a bonafede of the work done by CELESTY SAM, (Reg, No: MLM19MBA35), as a part of the project work during the fifth trimester in partial fulfilment of the requirements of the degree of MASTER OF BUSINESS ADMINISTRATION of APJ Abdul Kalam Technological University (KTU), Thiruvananthapuram.



Project Guide

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ETTUMANOOR

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KOTTAYAM



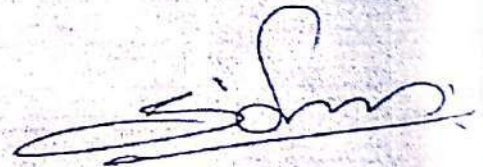
CERTIFICATE

This is to certify that the report titled "A STUDY ON CUSTOMER SATISFACTION TOWARDS RELIANCE JIO" being submitted by MR.ABIN K THOMAS, Reg No: MLM19MBA04, sixth Trimester student of this institution in partial fulfilment of the requirements of the award Degree of Master of Business Administration, is bonafide record of the project work done by MR.ABIN K THOMAS of Department of Management Studies, Mangalam College of Engineering.



Faculty Guide

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Ettumanoor, Kottayam



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MANGALAM COLLEGE OF ENGINEERING, KOTTAYAM



CERTIFICATE

This is to certify that the Project Report is a bonafide record of the work done by **ALPHIN TOMY** (Reg No: MLM19MBA11) as part of the project work during the sixth trimester on "A STUDY ON EMPLOYEE MOONLIGHTING AMOUNG IT PROFESSIONALS IN INFOPARK, KOCHI", in partial fulfilment of the requirements of the degree of **MASTER OF BUSINESS ADMINISTRATION** of A.P.J Abdul Kalam Technological University (KTU), Thiruvananthapuram, under the guidance of **Mr. BOSE TOM**, Associate Professor, Mangalam College of Engineering, Ettumanoor, Kottayam.


Project Guide

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DEPARTMENT OF MANAGEMENT STUDIES
MANGALAM COLLEGE OF ENGINEERING, KOTTAYAM



CERTIFICATE

This is to certify that this project study report entitled "A STUDY ON THE EFFECTIVENESS OF ADVERTISEMENT TOWARDS THE PURCHASE OF HYUNDAI CARS, KERALA" is bonafide record of the work done by ANANTHU SURENDRAN (MLM19MBA21) as a part of the Project work during the sixth trimester in partial fulfilment of the requirements of the degree of MASTER OF BUSINESS ADMINISTRATION of A.P.J Abdul Kalam Technological University (KTU), Thiruvananthapuram.




Project Guide


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DEPARTMENT OF MANAGEMENT STUDIES
MANGALAM COLLEGE OF ENGINEERING
ETTUMANOOR, KOTTAYAM



CERTIFICATE

This is to certify that major project entitled 'A Study on the effectiveness of Training and Development program in Travancore Cochin Chemicals Ltd, ' being submitted by Ms. Athira Ramesh (MLM19MBA31), in partial fulfilment of the requirements for the award of the Degree of Master of Business Administration, is a bonafide record of the project work done by Athira Ramesh of Department of Management Studies, Mangalam College Of Engineering, Ettumanoor, Kottayam.

Project Guide

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CERTIFICATE

This is to certify that the report titled "A STUDY ON EFFECTIVENESS OF EMPLOYEE RETENTION AT KBR TEXTILES PRIVATE LIMITED" is a bonafide record of the work done by ELIZABETH THOMAS (Reg No: MLM19MBA39) during the sixth trimester in partial fulfilment of the requirements of the degree of MASTER OF BUSINESS ADMINISTRATION of A.P.J Abdul Kalam Technological University (KTU), Thiruvananthapuram, under the guidance of Mrs. RINTA GEORGE, Assistant Professor, Mangalam College of Engineering, Ettumanoor, Kottayam.




Mrs. Rinta George
Assistant Professor
Faculty Guide


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Head of the Department


Prof. Dr. John T. Varughese
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DEPARTMENT OF MANAGEMENT STUDIES
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CERTIFICATE

This is to certify that the report titled A PROJECT REPORT ON EFFECTIVENESS OF ADVERTISEMENTS IN THE MARKETING OF FOREST INDUSTRIES TRAVANCORE LIMITED, ALUVA, being submitted by MR. MIDHUN JAYAN, (Reg No: MLM19MBA57), sixth Trimester student of this institution in partial fulfilment of the requirements of the award Degree of Master of Business Administration, is a bonafide record of the project work Under the guidance of DR.SIBY JAMES, ASSOCIATE PROFESSOR ,DEPARTMENT OF MANAGEMENT STUDIES, MANGALAM COLLEGE OF ENGINEERING.


Faculty Guide

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Head of the Department


Dean of the Department

Prof. (Dr) JOHN T. VARUGHESE
Dean, Department of Management Studies
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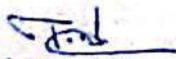
DEPARTMENT OF MANAGEMENT STUDIES

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CERTIFICATE

This is to certify that the Project Report is a bonafide record of the work done by Mr. SACHIN K KUMAR (Reg No: MLM19MBA69) as part of the project work during the sixth trimester on " A STUDY ON RECEIVABLES MANAGEMET OF TRAVANCORE SUGARS AND CHEMICALS, LTD, THIRUVALLA" , in partial fulfilment of the requirements for the award of the Degree of Master Of Business Administration of A.P.J Abdul Kalam Technological University (KTU), Thiruvananthapuram, under the guidance of Mrs. TINTA BABY, Associate Professor, Mangalam College of Engineering, Ettumanoor, Kottayam


Project guide

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ENGINEERING KOTTAYAM



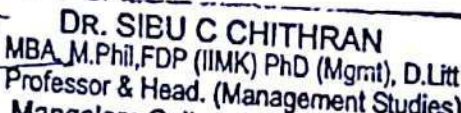
CERTIFICATE

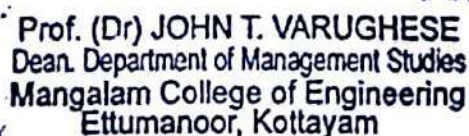
This is to certified that the report entitled **A STUDY ON FINANCIAL PERFORMANCE OF HDFC BANK** being submitted by **Mr. SOORAJ BABU (MLM19MBA79)** in partial fulfilment of the requirements for the award of the degree of the Master of Business administration, is a bonafied record of the project work done by **MR. SOORAJ BABU** of Department of Management studies, Mangalam college of engineering Kottayam.



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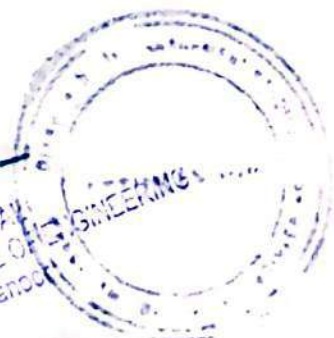

Head of the Department


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DEPARTMENT OF MANAGEMENT STUDIES
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CERTIFICATE

This is to certify that the report titled "A STUDY ON FACTORS AFFECTING CONSUMERS'S PURCHASE DECISION OF CURRY POWDER WITH SPECIAL REFERENCE TO EASTERN CONDIMENTS PVT LTD" being submitted by VISHAK HARIKUMAR, Roll No. MLM19MBA89, in partial fulfilment of the requirements for the award of the Degree of Master of Business Administration, is a bonafide record of project work done by VISHAK HARIKUMAR of Department of Management Studies, Mangalam College of Engineering.


Faculty Guide

• NEETHU K. N. CHANDRA
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Dean of the Department

Prof. (Dr) JOHN T. VARUGHESE
Dean, Department of Management Studies
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Ettumanoor, Kottayam

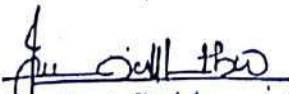
DEPARTMENT OF MANAGEMENT STUDIES

MANGALAM COLLEGE OF ENGINEERING ETTUMANOOR,
KOTTAYAM

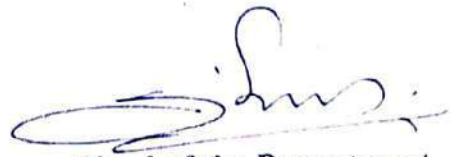


CERTIFICATE

This is to certify that this project study report entitled "A COMPARATIVE STUDY OF EXPENDITURE AND INCOME GENERATED BY AIR INDIA, BANGALORE" is a bona fide record of the work done by Ms. AISWARYA.S as a Project Work during the sixth trimester in partial fulfillment of the requirement for the award of the Degree of MASTER OF BUSINESS ADMINISTRATION, (MBA) of APJ Abdul Kalam Technological University, Trivandrum.


Project Guide





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DEPARTMENT OF MANAGEMENT STUDIES


MANGALAM COLLEGE OF ENGINEERING

ETTUMANOOR, KOTTAYAM



CERTIFICATE


This is to certify that the report entitled A STUDY ON WORKING CAPITAL ON THE TOLINS TYRES Pvt.Ltd is being submitted by ALVIN ANTONY, MLM19MBA12 in partial fulfillment of the requirement for the award of the Degree of Master of Business Administration, isa bonafide record of the project work done by Mr.ALVIN ANTONY MLM19MBA12 Department of Management Studies Mangalam College of Engineering Ettumanoor.


Faculty Guide

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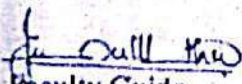

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MANGALAM COLLEGE OF ENGINEERING, KOTTAYAM



CERTIFICATE

This is to certify that this Internship Report is a bonafide record of the work done by Ms. ANILA. R (Reg.No: MLM19MBA22) as a part of the Project work during the Sixth trimester at, KOTAK SECURITIES in partial fulfilment of the requirements for the award of the degree of MASTER OF BUSINESS ADMINISTRATION (MBA) of Abdul Kalam Technical University, Thiruvananthapuram under the guidance of Ms. JEENU MATHEW, Assistant Professor, Mangalam College of Engineering, Ettumanoor, Kottayam.


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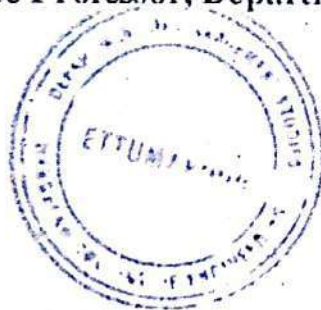


CERTIFICATE

This is to certify that the Project Report is a bonafide record of the work done by ATHIRA S (Reg No: MLM19MBA32) as part of the project work during the sixth trimester on "A STUDY ON THE ORGANIZATIONAL CULTURE AND ITS IMPACT ON EMPLOYEE PERFORMANCE IN KITEX LIMITED", in partial fulfilment of the requirements of the degree of MASTER OF BUSINESS ADMINISTRATION of A.P.J Abdul Kalam Technological University (KTU), Thiruvananthapuram, under the guidance of Mr. BOSE TOM, Associate Professor, Department of Management Studies, Ettumanoor, Kottayam.


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DEPARTMENT OF MANAGEMENT STUDIES
MANGALAM COLLEGE OF ENGINEERING
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CERTIFICATE


This is to certify that major project entitled 'A Study On Financial Performance Evaluation Of Selected Debt And Equity Under Uti Ame' being submitted by Ms. JESLINE JOSEPH (MLM19MBA45), in partial fulfilment of the requirements for the award of the Degree of Master of Business Administration, is a bonafide record of the project work done by JESLINE JOSEPH of Department of Management Studies, Mangalam College Of Engineering, Ettumanoor, Kottayam.


Project Guide

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Dean of the Department

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Dean, Department of Management Studies,
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Head of the Department

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DEPARTMENT OF MANAGEMENT STUDIES
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR
KOTTAYAM



CERTIFICATE

This is to certify that the Project report is a bonafide record of the work done by NIDHIN JOSE PJ (Reg. no: MLM19MBA62), as a part of the Project work during the sixth trimester at " A STUDY ON THE EFFECTIVENESS OF MARKETING COMMUNICATION STRATEGIES ADOPTED BY AUTOMOBILE COMPANIES WITH SPECIAL REFERENCE TO HYUNDAI MOTOR COMPANY" in partial fulfilment of the requirements for the award of the degree of MASTER OF BUSINESS ADMINISTRATION of APJ Abdul Kalam Technological University (KTU), Thiruvananthapuram, under guidance of Mr. BOSE TOM, Associate Professor, Mangalam College of Engineering, Ettumanoor, Kottayam.


Faculty Guide




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Dean of the Department

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Ettumanoor

DEPARTMENT OF MANAGEMENT STUDIES
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR
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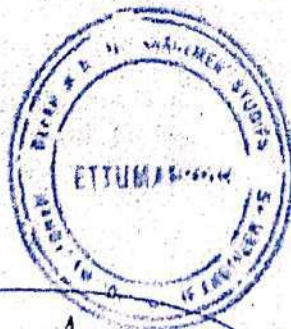
CERTIFICATE

This is to certify that the report titled "A study on Financial performance Analysis at Royal Enfield Ltd" being submitted by Sandhya Rajan vrMLM19MBA72, in partial fulfilment of the requirements for the award of the Degree of Master of Business Administration, is a bonafide record of the project work done by Sandhya Rajan VR of Mangalam Management Studies, Mangalam College of Engineering

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Project Guide

Ms. JEEVI MATHEW
Assistant Professor

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Ettumanoor, Kottayam



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Dean of the Department

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Head of the Department

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[Signature]
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DEPARTMENT OF MANAGEMENT STUDIES

MANGALAM COLLEGE OF ENGINEERING, KOTTAYAM



CERTIFICATE


This is to certify that the report titled "A STUDY ON RECRUITMENT AND SELECTION PROCESS OF EY (ERNST & YOUNG)" being submitted by SURYA PRABHAKARAN (MLM19MBA82) in partial fulfilment of the requirements for the award of the Degree of Master of Business Administration, is a bonafide record of the project work done by SURYA PRABHAKARAN of Department of Management Studies, Mangalam College of Engineering, Ettumanoor.


Project Guide




Head of the department

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Prof. JOHN T. VARUGHESSE
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DEPARTMENT OF MANAGEMENT STUDIES
MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR



CERTIFICATE

This is to certify that the report titled "A STUDY ON PERFORMANCE EVALUATION OF EQUITY IN MUTUAL FUND WITH GEOJIT FINANCIAL SOLUTIONS LTD, ERNAKULAM" being submitted by Vyshakh P B, MEM19MBA90 in partial fulfilment of the requirements for the award of the Degree of Master of Business Administration, is a bonafide record of the project work done by Vyshakh P B of Department of Management Studies, Mangalam College of Engineering, Ettumanoor.


Project Guide




Head of The Department

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Dean, Dept of Management studies

Prof. (Dr) JOHN T. VARUGHESE
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Ettumanoor

DEPARTMENT OF MANAGEMENT STUDIES
MANGALAM COLLEGE OF ENGINEERING,
ETTUMANOOR, KOTTAYAM



CERTIFICATE

This is to certify that the report titled "A STUDY ON FINANCIAL PERFORMANCE ANALYSIS AT FACT LIMITED, ELOOR" being submitted to RINTA GEORGE in partial fulfillment of the requirements for the award of the Degree of Master of Business Administration, is abona fide record of the project work done by AMALUMOL MADHUJOJ Department of Management Studies, Mangalam College of Engineering, Ettumanoor Kottayam.


Project Guide

Ms. RINTA GEORGE
Assistant
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Ettumanoor, Kottayam


Dean of the Department

Prof. (Dr) JOHN T. VARUGHESE
Dean, Department of Management Studies
Mangalam College of Engineering
Ettumanoor, Kottayam


Head of the Department


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ETTUMANOOR



CERTIFICATE

This is to certify that this project study report entitled "A PROJECT REPORT ON CUSTOMER SATISFACTION AND SERVICEQUALITY UNDERTAKEN AT TATA MOTORS " is a bonafide of the work done by ASHIK VJAY, (Reg. No: MLM19MBA27), as apart ofthe project work during the sixth trimester in partial fulfilment of the requirements of the degree of MASTER OF BUSINESS ADMINISTRATION Of APJ Abdul Kalam Technological University (KTU) Thiruvananthapuram


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CERTIFICATE


This is to certify that the report titled "A STUDY ON DEALERS PERCEPTION TOWARDS MILMA PRODUCTS WITH SPECIAL REFERENCES TO PATHANAMTHITTA DISTRICT" being submitted by Ms. DIVYA PRADEEP, Reg No: MLM19MBA38, sixth Trimester student of this institution in partial fulfilment of the requirements of the award Degree of Master of Business Administration, is bonafide record of the project work done by Ms. DIVYA PRADEEP of Department of Management Studies, Mangalam College of Engineering


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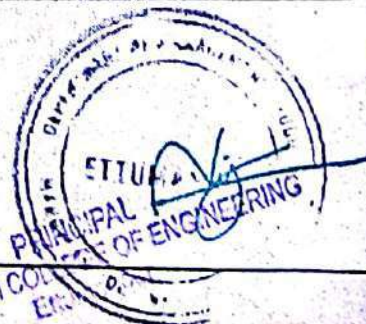
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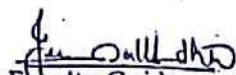
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KOTTAYAM




CERTIFICATE


This is to certify that the report titled "A STUDY ON FINANCIAL ANALYSIS OF SELECTED POWER SECTOR SECURITIES LISTED IN NATIONAL STOCK EXCHANGE" being submitted by Mr. JERIN JACOB JOHN, Reg No: MLM19MBA44, Sixth Trimester student of this institution in partial fulfilment of the requirements of the award Degree of Master of Business Administration, is bonafide record of the project work done by Mr. JERIN JACOB JOHN of Department of Management Studies, Mangalam College of Engineering


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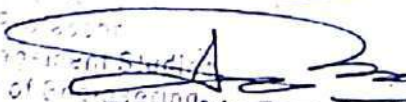
CERTIFICATE

This is to certify that the Project report is a bonafide record of the work done by KRISHNAKUMAR M R (Reg. no: MLM19MBA51), as a part of thei Project work during the sixth trimester at "FINANCIAL STATEMENT ANALYSIS AT KERALA AGRO MACHINERY CORPORATION LIMITED" in partial fulfilment of the requirements for the award of the degree of MASTER OF BUSINESS ADMINISTRATION of APJ Abdul Kalam Technological University (KTU), Thiruvananthapuram, under guidance of Mrs.TINTA BABY, Associate Professor, Mangalam College of Engineering, Ettumanoor, Kottayam.


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This is to certify that this Project Report is a bonafide record of the work done by **Mr. MUHAMMED ALFAS CS, MLM19MBA59** as a part of project work during the 6th Trimester project titled "A STUDY ON EFFECTIVENESS OF THE PRODUCT POSITIONING STRATEGIES AMONG THE CUSTOMERS OF DHANWANTHARI VAIDYASHALA, IDUKKI" in partial fulfilment of the requirements for the award of the degree of MASTER OF BUSINESS ADMINISTRATION of the Abdul Kalam Technological University (KTU), Thiruvanthapuram.

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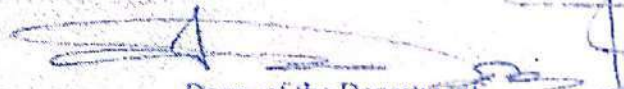
This is to certify that the report titled A STUDY ON FINANCIAL PERFORMANCE OF HINDUSTAN PETROLEUM CORPORATION Ltd. MUMBAI being submitted by Mr SHONE CHACKO EAPEN, Reg No. MLM19MBA75, sixth Trimester student of this Institute in partial fulfilment of the requirements of the award Degree of Master of Business Administration, is a bonafide record of the project work done by Mr SHONE CHACKO EAPEN of Department of Management Studies, Mangalam College of Engineering.


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CERTIFICATE

This is to certify that the report titled AN EXPLANATORY STUDY OF CUSTOMER SATISFACTION AT VOLKSWAGEN being submitted by Mr. THOMAS C ALPHONS, Reg No: MLM19MBA85, sixth Trimester student of this institution in partial fulfilment of the requirements of the award Degree of Master of Business Administration, is a bonafide record of the project work done by Mr. THOMAS C ALPHONS of Department of Management Studies, Mangalam College of Engineering.


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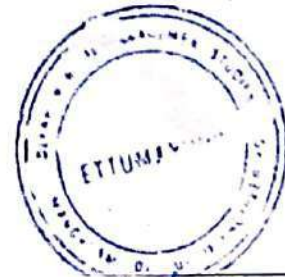
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CERTIFICATE

This is to certify that mini project entitled 'A Study On Financial Performance Analysis of Toyota motor Corporation' being submitted by Ms. Vidhya M Gopinath (MLM19MBA87), in partial fulfilment of the requirements for the award of the Degree of Master of Business Administration, is a bona fide record of the project work done by Vidhya M Gopinath of Department of Management Studies, Mangalam College of Engineering, Ettumanoor, Kottayam.


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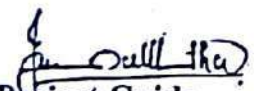

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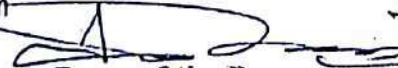
This is to certify that project entitled 'A Study On Financial Performance Analysis At Hindustan Coca-Cola Beverages Private Limited Bangalore' being submitted by Mr. Aswin P S(MLM19MBA29), in partial fulfilment of the requirements for the award of the Degree of MASTER OF BUSINESS ADMINISTRATION, is a bona fide record of the project work done by Aswin P S of Department of Management Studies, Mangalam College Of Engineering, Ettumanoor, Kottayam.



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CERTIFICATE

This is to certify that the report entitled "Financial Performance Analysis of ICICI Bank, Thiruvananthapuram" being submitted by Ms. MEENU BIJU, MLM19MBA54, in partial fulfilment of the requirements for the award of the Degree of Master of Business Administration is a bonafide record of the project work done by MEENU BIJU, Department of Management studies, Mangalam College of Engineering, Kottayam.

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This is to certify that "A STUDY ON THE EFFECTS OF BRAND ASSOCIATION OF AVT TEA AMONG HOME MAKERS AT AVT NPL, ALUVA" being submitted by ABIJITH ASHOK MAGAR (MLM19MBA03) as a part of the project work done during Sixth trimester in partial fulfilment of the requirements for the award of the Degree of Master of Business Administration, is a bonafied record of the project work done ABIJITH ASHOK MAGAR of DEPARTMENT OF MANAGEMENT STUDIES, MANGALAM COLLEGE OF ENGINEERING.

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CERTIFICATE

This is to certify that the report titled "EFFECTIVE MEANS OF CASH MANAGEMENT AT IDS NEXT BUSINESS SOLUTION BANGALORE" being submitted by Ms. AMINA ALI, Reg No: MLM19MBA16, sixth Trimester student of this institution in partial fulfilment of the requirements of the award Degree of Master of Business Administration, is bonafide record of the project work done by Ms. AMINA ALI of Department of Management Studies, Mangalam College of Engineering

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CERTIFICATE

This is to certify that the report titled "BRAND LOYALTY & MARKET PREFRANCE OF ABTEC M/S AGRO BIOTECH RESEARCH CENTRE LTD" is a bonafide record of the work done by Mr. AKSHAY KUMAR P R as a part of the Project work during the Sixth Trimester in partial fulfilment of the requirements for the award of the Degree of MASTER OF BUSINESS ADMINISTRATION (MBA) of Dr A P J Abdul Kalam Technological University.

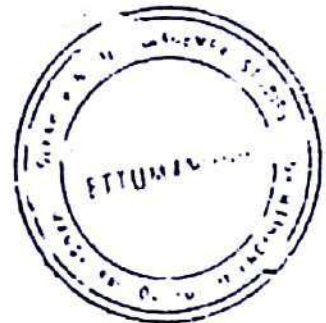
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CERTIFICATE

This is to certify that the report titled "A STUDY ON ADVERTISING EFFECTIVENESS OF PRINT MEDIA AMONG YOUTH" being submitted by Ms. DEEPA DILEEP, Reg No. MAM19M1636, sixth Trimester student of this institution in partial fulfillment of the requirements of the award Degree of Master of Business Administration, is a bonafide record of the project work done by Ms. DEEPA DILEEP of Department of Management Studies, Mangalam College of Engineering.

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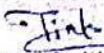


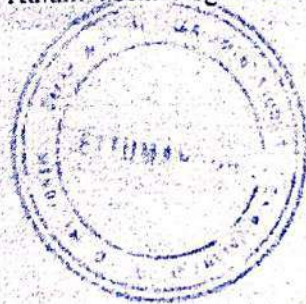
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This is to certify that the project report on "A STUDY ON WORKING CAPITAL MANAGEMENT OF NICE CHEMICALS PVT.LTD,EDAPPALLY" is a bonafide work done by SHINNU JOHNSON (Reg. No. MLM19MBA74) submitted in partial fulfillment of the requirement for the award of the Master's Degree in Business Administration of APJ Abdul Kalam Technological University, Thiruvananthapuram during the year 2021.



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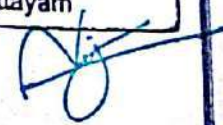



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CERTIFICATE

This is to certify that the report entitled **A STUDY ON LIQUIDITY AND PROFITABILITY ANALYSIS OF KSE LTD, IRINJALAKUDA, KERALA** is being submitted by **Ms.A.THASNY MOL MLM19MBA30** in partial fulfillment of the requirement for the award of the Degree of Master of Business Administration, is a bonafide record of the project work done by **Ms.A.THASNY MOL**, Department of Management Studies Mangalam College of Engineering Ettumanoor.



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CERTIFICATE

This is to certify that the Project Report is a bonafide record of the work done by **AKHIL K S (Reg No: MLM19MBA07)** as part of the project work during the sixth trimester on "**A STUDY ON WORKING CAPITAL MANAGEMENT AT MALABAR CEMENTS LIMITED**", in partial fulfilment of the requirements of the degree of **MASTER OF BUSINESS ADMINISTRATION** of **A.P.J Abdul Kalam Technological University (KTU)**, Thiruvananthapuram, under the guidance of **Mrs. TINTA BABY**, Associate Professor, **Mangalam College of Engineering, Ettumanoor, Kottayam.**



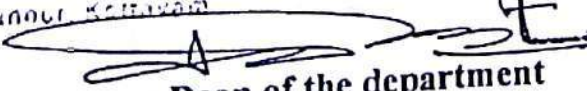

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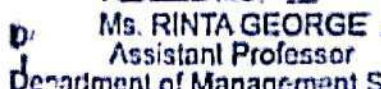
CERTIFICATE


This is to certify that the report titled "A STUDY ON EMPLOYEE WELFARE SCHEMES IN MRF PRIVATE LIMITED, KOTTAYAM" is a bonafide record of the work done by AMBILY K.G (Reg No: MLM19MBA15) during the sixth trimester in partial fulfilment of the requirements of the degree of MASTER OF BUSINESS ADMINISTRATION of A.P.J Abdul Kalam Technological University (KTU), Thiruvananthapuram, under the guidance of Mrs.RINTA GEORGE, Assistant Professor, Mangalam College of Engineering, Ettumanoor, Kottayam.


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CERTIFICATE

This is to certify that the report titled "A STUDY TO UNDERSTAND THE EFFECTIVENESS OF ADVERTISEMENTS OF INDIGO PAINTS AMONG THE DEALERS IN PATHANAMTHITTA REGION" being submitted by Ms ANJALI S KANNAN, Reg No: MLM19MBA23, sixth Trimester student of this institution in partial fulfilment of the requirements of the award Degree of Master of Business Administration, is bonafide record of the project work done by Ms. ANJALI S KANNAN of Department of Management Studies, Mangalam College of Engineering

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This is to certify that the report titled "A STUDY ON EFFECTIVENESS OF SALES PROMOTIONAL ACTIVITIES OF VESTA ICE CREAM" being submitted by ATHUL DON JACOB in partial fulfilment of the requirements for the award of the Degree of Master of Business Administration, is a bonafide record of the project work done by ATHUL DON JACOB Department of M.B.A, Mangalam College of Engineering, Ettumanoor, Kottayam.

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CERTIFICATE

This is to certify that the report titled "A study on the effectiveness of the marketing strategies adopted by Johnson and Johnson Pvt. Ltd." being submitted by **MR. JESTIN KUNJAPPI**, Reg No: MLM19MBA46, sixth Trimester student of this institution in partial fulfilment of the requirements of the award Degree of Master of Business Administration, is bonafide record of the project work done by **MR. JESTIN KUNJAPPI** of Department of Management Studies, Mangalam College of Engineering.

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Head of the Department

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MANGALAM COLLEGE OF ENGINEERING, KOTTAYAM



CERTIFICATE

This is to certify that the Project Report is a bonafide record of the work done by NIKHIL JOSEPH (Reg No: MLM19MBA63) as part of the project work during the sixth trimester on "A STUDY ON CUSTOMER SATISFACTION OF FIFA OIL MILLS PVT.LTD", in partial fulfillment of the requirements of the degree of MASTER OF BUSINESS ADMINISTRATION of A.P.J Abdul Kalam Technological University (KTU), Thiruvananthapuram, Under the guidance of Dr. SIBU C CHITHRAN, Mangalam College of Engineering, Ettumanoor , Kottayam.

Project Guide

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DEPARTMENT OF MANAGEMENT STUDIES

MANGALAM COLLEGE OF ENGINEERING, KOTTAYAM




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CERTIFICATE

This is to certify that the Report titled "A Study on the Effectiveness of Working Capital Management of Synthite Industries Private Ltd" being submitted by Ms. SILPA SIVANANDAN (Reg.No: MLM19MBA77), in partial fulfilment of the requirement for the award of the Degree of Master of Business Administration, is a bonafide record of the Project work done by Ms. SILPA SIVANANDAN of Department of Management Studies, Mangalam College of Engineering, Ettumanoor, Kottayam.




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This is to certify that this project study report entitled "A STUDY ON THE EFFECTIVENESS OF INTERNET ADVERTISING ON CONSUMER BEHAVIOUR WITH SPECIAL REFERENCE TO CREATIVE MINDS TECHNOLOGIES, BANGALORE" is a bonafide of the work done by SWATHI KRISHNA, (Reg. No: MLM19MBA83), as a part of the project work during the sixth trimester in partial fulfillment of the requirements of the degree of MASTER OF BUSINESS ADMINISTRATION OF APJ Abdul Kalam Technological University (KTU) Thiruvananthapuram.



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CERTIFICATE

This is to certify that this project study report entitled "A STUDY ON THE BRAND LOYALTY OF VKC PRIVATE LIMITED" is bonafide record of the work done by ABHIJITH SATHEESAN (MLM19MB101) as a part of the Project work during the sixth trimester in partial fulfilment of the requirements of the degree of MASTER OF BUSINESS ADMINISTRATION of A.P.J. Abdul Kalam Technological University (KTU), Thrissur, Kerala.



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CERTIFICATE

This is to certify that the Project Report is a bonafide record of the work done by Mr. ANANDHAKRISHNAN, J (Reg. No: MLAM19MDA18) as a part of the Project work during the Sixth semester at RELIANCE JIO in partial fulfillment of the requirements for the award of the degree of MASTER OF BUSINESS ADMINISTRATION (MBA) of Abdul Kalam Technical University, Thiruvananthapuram under the guidance of Dr. SHY JAMES, Associate Professor, Mangalam College of Engineering, Ettimamoor, Kottayam.


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CERTIFICATE

This is to certify that the Project Report entitled "A STUDY ON COST VOLUME PROFITABILITY ANALYSIS AT HINDUSTAN INSECTICIDES LTD, UDYOGAMANDAL" being submitted by MS ASWATHY SIBY (REG NO:MLM19MBA28) as a part of the project work done during the sixth semester in partial fulfillment of the requirement for the award of the degree of MASTER OF BUSINESS ADMINISTRATION(MBA) is a bonafied report of project work done by Department of Management Studies, Mangalam College of Engineering, Ettumanoor


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CERTIFICATE

This is to certify that the report entitled A STUDY ON CASH MANAGEMENT AT AUTOKAST LTD CHERTHALA is being submitted by Ms.FARSA AZIZ MLM19MBA40 in partial fulfillment of the requirement for the award of the Degree of Master of Business Administration, is a bonafide record of the project work done by Ms.FARSA AZIZ Department of Management Studies Mangalam College of Engineering Ettumanoor.

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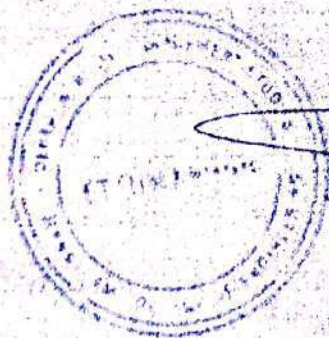
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MANGALAM COLLEGE OF ENGINEERING,
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CERTIFICATE

This is to certify that the report titled "A study on inventory management at Alleppey corporative spinning mill, Kayamkulam" being submitted by Jiji Raj (MLM19MBA48), in partial fulfilment of the requirements for the award of the Degree of Master of Business Administration, is a bonafide record of the project work done by Jiji Raj of Department of management studies, Mangalam college of engineering, Ettumanoor.


Project guide




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CERTIFICATE

This is to certify that the report entitled "A Study On Quality Work Life of People at THE REGIONAL AGRO INDUSTRIAL DEVELOPMENT CO-OPERATIVE OF KERALA LIMITED [RAIDCO]" being submitted by Mr. LOUSAN T JOSEPH, MLM19MBA53, in partial fulfilment of the requirements for the award of the Degree of Master of Business Administration is a bonafied record of the project work done by Mr. LOUSAN T JOSEPH, Department of Management studies, Mangalam college of engineering, Kottayam.


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MANGALAM COLLEGE OF ENGINEERING

DEPARTMENT OF MANAGEMENT STUDIES MANGALAM
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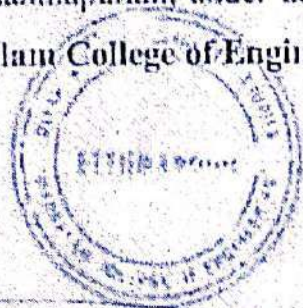


CERTIFICATE

This is to certify that the Project Report is a bonafide record of the work done by **NANDHANA NANDHAKUMAR** (Reg No: MLM19MBA60) as part of the project work during the sixth trimester on "A STUDY ON WORKING CAPITAL ASSESSMENT" in partial fulfilment of the requirements of the degree of **MASTER OF BUSINESS ADMINISTRATION** of A.P.J Abdul Kalam Technological University (KTU), Thiruvananthapuram, under the guidance of Ms. **TINTA BABY**, Associate Professor, Mangalam College of Engineering, Ettumanoor, Kottayam.


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CERTIFICATE

This is to certify that major project entitle "titled Impact Of Technology On Payment, Clearing And Settlement -A Study On Block chain Technology being submitted by PRIYANKA S, MLM19MBA68, in partial fulfilment of the requirements for the award of the Degree of Master of Business Administration, is a bonafide record of the project work done PRIYANKA S of Department of Management Studies, Mangalam College Of Engineering, Ettumanoor, Kottayam.


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CERTIFICATE

This is to certify that this project study report entitled "A PROJECT REPORT ON ADVERTISEMENT EFFECTIVENESS AND BUYING PREFERENCE WITH SPECIAL REFERENCE TO SAMSUNG MOBILES" is a bonafide of the work done by SNEHA MARIAM IYPE, (Reg. No: MLM19MBA78), as a part of the project work during the sixth trimester in partial fulfilment of the requirements of the degree of MASTER OF BUSINESS ADMINISTRATION of APJ Abdul Kalam Technological University (KTU), Thruvananthapuram.


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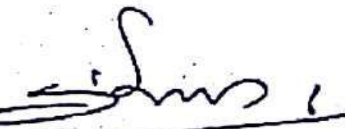



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CERTIFICATE

This is to certify that this project Report is a bonafide record of the work done by THASNI S (Reg. no: MLMI9MBA84), during the sixth trimester at "RELIANCE SMART (RELIANCE RETAIL LTD), COCHIN in partial fulfilment of the requirements for the award of the degree of MASTER OF BUSINESS ADMINISTRATION of APJ Abdul Kalam Technological University (KTU), Thiruvananthapuram under guidance of DR.SIBU C CHITRAN , Head of the Department, Mangalam College of Engineering, Ettumanoor, Kottayam.




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