Mangalam Campus Mangalam Hills, Vettimukal P.O Ettumanoor, Kottayam Kerala-686631





Ph :+91-481-2710120, +91-481-2537053 +91-481-2533711, Fax: +91-481-2533700 Web : www.mangalam.ac.in E-mail: info@mangalam.in

-(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 IANGALAM COLLEGE OF ENGINEERING EttuPrincipal

Program name	Program code	Name of the Course that include experiential learning through project work/field work/internship	Course co
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
012011		COMPUTER PROGRAMMING AND	
B TECH	CE	COMPUTATIONAL TECHNIQUES	CE 306
B TECH	CE	CONSTRUCTION TECHNOLOGY	CE 204
BTECH	CE	DESIGN OF CONCRETE STRUCTURES	CE 301
BTECH	CE	DESIGN OF CONCRETE STRUCTURES I	CE 301
BTECH	CE	DESIGN OF CONCRETE STRUCTURES II	CE 304
BTECH	CE	DESIGN OF HYDRAULIC STRUCTURES	CE 302
B TECH	CE	DESIGN OF STEEL STRUCTURES	CE 401
B TECH	CE	DESIGN PROJECT	CE 341
BTECH	CE	ENGINEERING MECHANICS	BE 100
BTECH	CE	ENVIRONMENT & POLLUTION	CE 371
BTECH	CE	ENVIRONMENTAL ENGINEERING I	CE 402
BTECH	CE	ENVIRONMENTAL ENGINEERING I	CE 402
BTECH	CE	ENVIRONMENTAL ENGINEERING LAB	CE 431
BTECH	CE	ENVIRONMENTAL IMPACT ASSESSMENT	CE 469
BTECH	CE	FLUID MECHANICS LAB	CE 234
BTECH	CE	FLUID MECHANICS LAB	CE 203
BTECH	CE	FLUID MECHANICS I	CE 206
B TECH	CE	GEO ENVIRONMENTAL ENGINEERING	CE 465
BTECH	CE	GEOMATICS	CE 307
BTECH	CE	GEOTECHNICAL ENGINEERING I	CE 208
BTECH	CE	GEOTECHNICAL ENGINEERING II	CE 305
BTECH	CE	GEOTECHNICAL ENGINEERING LAB	CE 333
BTECH	CE	GROUND IMPROVEMENT TECHNIQUES	CE 362
BTECH	CE	INTRODUCTION TO CIVIL ENGINEERING	BE101-01
B TECH		INTRODUCTION TO SUSTAINABLE ENGINEERING	BE 103
в тесн	CE	INTRODUCTION TO SUSTAINABLE ENGINEERING	BE 103
B TECH	CE	MATERIAL TESTING LAB	CE 232
3 TECH	CE	MATERIAL TESTING LAB II	CE 331
3 TECH	CE	MECHANICS OF SOLIDS	CE 201
3 TECH	CE	MUNICIPAL SOLID WASTE MANAGEMENT	CE 474
TECH	CE F	ROJECT	CE 492
TECH	CE C	QUANTITY SURVEYING AND VALUATION	CE 409
TECH	CE S	EMINAR & PROJECT PRELIMINARY	CE 451
TECH	CE S	TRUCTURAL ANALYSIS I	CE 202
TECH	CE S	TRUCTURAL ANALYSIS II	CE 303
TECH	CE S	TRUCTURAL ANALYSIS III	CE 403
TECH	CE SI	JRVEY LAB	CE 233
TECH	CE SI	JRVEYING	CE 207
TECH	CE TH	RAFFIC ENGINEERING AND MANAGEMENT	CE 366

PRINCIPAL) IANGALAM COLLEGE OF ENGINEERING Ettumanoor

Program name	Program code	e Name of the Course that include experiential learning through project work/field work/internship	Course coo
B TECH	CE	TRANSPORTATION ENGINEERING I	CE 308
B TECH	CE	TRANSPORTATION ENGINEERING II	CE 407
B TECH	CE	TRANSPORTATION ENGINEERING LAB	CE 332
BTECH	CE	WATER RESOURCE ENGINEERING	CE 309
BTECH	CSE	THEORY OF COMPUTATION	CS 301
	CSE	DESIGN AND ANALYSIS OF ALGORITHMS	CS 302
B TECH	CSE	SYSTEM SOFTWARE	CS 303
BTECH	The books		CS 304
B TECH	CSE		CS 306
B TECH	CSE		CS 307
B TECH	CSE	DATA COMMUNICATION	0000
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 DEVOLOPMENT 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
BTECH	CSE	COMPUTER SYSTEM ARCHITECTURE	CS 405
BTECH	CSE	DISTRIBUTED COMPUTING	CS 407
BTECH	CSE	CRYPTOGRAPHY AND NETWORK SECURITY	CS 409
BTECH	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
BTECH	CSE	EMBEDDED SYSTEMS	CS 402
BTECH	CSE	DATA STRUCTURES LAB	CSL 201
BTECH	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		COMPUTER ORGANIZATION AND ARCHITECTURE	CST 202
	CSE	LOGIC SYSTEM DESIGN	CST 203
B TECH		OBJECT ORIENTED PROGRAMMING IN JAVA	CST 203
BTECH		DATABASE MANAGEMENT SYSTEM	CST 204
B TECH B TECH	CSE	COMPUTATIONAL FUNDAMENTALS FOR MACHINE	CST 294

PRINCIPAL ANGALAM COLLEGE OF ENGINEERING Ettumancor

Program name	Program code	Name of the Course that include experiential learning through project work/field work/internship	Course cod
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	CSE BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING	
B TECH	CSE	DESIGN & ENGINEERING	EST 200
BTECH	CSE	BASICS OF ROBOTICS	RAT 281
BTECH			RAT 282
M TECH	CSE	COMPUTATIONAL INTELLIGENCE	04 CS 6101
M TECH	CSE	ADVANCED DATA STRUCTUREE AND ALGORITHMS	04 CS 6103
MITCH	CSE	AUTOMATA THEORY AND COMPUTABILITY	04 CS 6104
M TECH			04 CS 6105
MITCOL	CSE	MODERN COMPUTER NETWORKS	04 CS 6107
M TECH	CSE	WEB SERVICES	04 CS 6109
M TECH		WEB SECURITY	04 CS 6114
M TECH	CSE	SOCIAL NETWORK ANALYTICS	04 CS 6115
MTECH	CSE	BIOINFORMATICS	04 CS 6118
M TECH	CSE	OPERATING SYSTEM DESIGN CONCEPTS	04 CS 6124
M TECH	CSE 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		WIRELESS SENSOR NETWORKS	04 CS 7105
M TECH	CSE	BIG DATA PROCESSING	04 CS7109
M TECH	CSE	RESEARCH METHODOLOGY	04 GN 6001
M TECH	ECE	ADVANCED COMMUNICATION SYSTEMS	EC404
B TECH	ECE	ANALOG COMMUNICATION ENGINEERING	EC208
B TECH	ECE	ANALOG INTEGRATED CIRCUITS	EC204
BTECH	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		BASICS OF ELECTRICAL ENGG	EE100
B TECH	ECE	BASICS OF MECHANICAL ENGINEERING	ME100
B TECH		BIOMEDICAL ENGINEERING	EC365
B TECH		CALCULUS	MA101
B TECH			CE110
B TECH	ECE	COMMUNICATION ENGINEERING LAB(ANALOG & DIGITAL)	EC332
		COMMUNICATION SYSTEMS LAB	EC431
B TECH B TECH			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
BTECH	ECE	DIGITAL SIGNAL PROCESSING LAB	EC333
BTECH	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
BTECH	ECE	LOGIC CIRCUIT DESIGN	EC207
BTECH	ECE	LOGIC CIRCUIT DESIGN	EC230
BTECH			EC334
BTECH		ECE MICROCNTROLLER LAB	
B TECH	ECE	MICROPROCESSORS AND MICROCONTROLLERS	EC305
B TECH	ECE	NETWORK THEORY	EC201
B TECH	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
BTECH	ECE	PROJECT PRELIMINARY	EC 451
BTECH	ECE	REAL TIME OPERATING SYSTEMS	EC366
BTECH	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
М.ТЕСН	ECE-VLSI & ES	ADVANCED DIGITAL DESIGN	04 EC 6503
M.TECH		ANALOG INTEGRATED CIRCUITS	04 EC 6502
M.TECH		CMOS VLSI DESIGN	04 EC 6505
M.TECH		COMPUTER APPLICATION LAB	04 CE 6493
		CONSTRUCTION METHODS & EQUIPMENTS	
M.TECH		DESIGN LAB 1	04 CE 6416 04 EC 6593
V.TECH			

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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	ECE-VLSI & ES	The second se	04 EC 6507
M.TECH	ECE-VLSI & ES		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
BTECH	EEE	BIOMEDICAL INSTRUMENTATION	EE372
BTECH	EEE	CIRCUITS & NETWORKS	EET201
BTECH	EEE	CIRCUITS AND MEASUREMENTS LAB COURSE PROJECT	EEL201
B TECH	EEE	DESIGN & ENGINEERING	EST 200
BTECH	EEE	DESIGN PROJECT	EE341
	EEE	DIGITAL ELECTRONICS	EET 206
BTECH	EEE	DIGITAL ELECTRONICS	EEL204
B TECH B TECH	EEE	DIGITAL SIGNAL PROCESSING	EE407
BTECH	EEE	DISTRIBUTED GENERATION AND SMART GRIDS	EE403
B TECH	EEE	ELECTRICAL & ELECTRONICS WORKSHOP	ESL 130
B TECH	EEE	ELECTRICAL MACHINE DESIGN	EE409
BTECH	EEE	ELECTRICAL MACHINES LAB II	EE333
BTECH	EEE	ELECTRICAL SYSTEM DESIGN	EE405
BTECH	EEE	ELECTROMAGNETICS	EE302
B TECH	EEE	ENGINEERING PHYSICS	PHT 100
BTECH	EEE	ENGINEERING PHYSISCS LAB	PHL 120
BTECH	EEE	LINEAR CONTROL SYSTEMS	EE303
B TECH .	EEE	MAIN PROJECT	EE492
BTECH	EEE	MEASUREMENTS & INSTRUMENTATION	EET203
B TECH	EEE	MICROPROCESSOR AND EMBEDDED SYSTEMS	EE309
B TECH		NEW AND RENEWABLE ENERGY SYSTEMS	EE367
B TECH		POWER ELECTRONICS	EE305
BTECH		POWER ELECTRONICS AND DRIVES LAB	EE334
втесн	FFF	POWER GENERATION, TRANSMISSION AND	EE301
DITECH		POWER SYSTEM LAB	EE431
BTECH		PROGRAMMING IN C	EST 102
BTECH		EMINAR & PROJECT PRELIMINARY	EE451
BTECH		SYSTEMS AND CONTROL LAB	EE332
BTECH		MAIN PROJECT	04EE7592
M.TECH		RESEARCH METHODOLOGY	04 GN 6001
M.TECH		ROJECT PHASE 1	04 GIV 0001 04EE7493

ANGALAM COLLEGE OF ENGINEERING

Program name	Program code	Name of the Course that include experiential learning through project work/field work/internship	Course cod
В ТЕСН	ME	PROBABILITY, STATISTICS AND NUMERICAL METHODS	MAT202
B TECH	ME	INDUSTRIAL ENGINEERING	ME 404
BTECH	ME	MECHANICS OF MACHINERY	ME301
BTECH	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
D TECH	ME	ADVANCED MANUFACTURING TECHNOLOGY	ME306
B TECH	ME	COMPUTER AIDED DESIGN AND ANALYSIS	ME308
B TECH	100,000,000,000,000	METROLOGY AND INSTRUMENTATION	ME312
B TECH	ME	MANUFACTURING TECHNOLOGY LAB I	ME331
B TECH ME COMPUTER AIDED DESIGN AND ANALYSIS LAB		ME332	
		MANUFACTURING TECHNOLOGY LAB II	ME334
B TECH	ME		ME341
B TECH	ME	DESIGN PROJECT	ME367
B TECH	ME	NON-DESTRUCTIVE TESTING	ME368
B TECH	ME	MARKETING MANAGAEMENT	ME401
B TECH	ME	DESIGN OF MACHINE ELEMENTS I	ME402
B TECH	ME	DESIGN OF MACHINE ELEMENTS II	ME403
B TECH	ME	ADVANCED ENERGY ENGINEERING	ME404
B TECH	ME	INDUSTRIAL ENGINEERING	ME405
B TECH	ME	REFRIGERATION & AIR CONDITIONING	ME407
B TECH	ME	MECHATRONICS	ME409
B TECH	ME	COMPRESSIBLE FLUID FLOW	ME431
B TECH	ME	MECHANICAL ENGINEERING LAB	ME451
B TECH	ME	SEMINAR AND PRELIMINARY	ME463
B TECH	ME	AUTOMOBILE ENGINEERING	
B TECH	ME	MATERIAL HANDLING & FACILITIES PLANNING	ME476 ME492
B TECH	ME	PROJECT	MEL201
BTECH	ME	COMPUTER AIDED MACHINE DRAWING	MEL201
BTECH	ME	FM & HM LAB	MEL202
BTECH	ME	MATERIALS TESTING LAB	MEL203
BTECH	ME	MACHINE TOOLS LAB-I	MET201
BTECH	ME	MECHANICS OF SOLIDS	
BTECH	ME	ENGINEERING THERMODYNAMICS	MET202
BTECH	ME	MECHANICS OF FLUIDS	MET203
B TECH	MF	MANUFACTURING PROCESS	MET204
	ME	METALLURGY & MATERIAL SCIENCE	MET205
B TECH	ME	FLUID MACHINERY	MET206
BTECH		METROLOGY AND INSTRUMENTATION	MET312
BTECH		ENGINEERING PHYSICS LAB	PHL120
BTECH		ENGINEERING PHYSICS B	PHT110
B TECH M.TECH		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	04 EE 6602
M.TECH	PEPS	RENEWABLE ENERGY SYSTEMS	04 EE 7503
M.TECH			04EE6492
M.TECH	PEPS MINI PROJECT 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
В ТЕСН	ME	BASICS OF ELECTRICAL & ELECTRONICS ENGINEERING	EST130
B TECH	ME	DESIGN AND ENGINEERING	EST200
BTECH	ME	PRINCIPLES OF MANAGEMENT	HS300
BTECH	ME	LINEAR ALGEBRA AND CALCULUS	MAT101
в тесн	ME	VECTOR CALCULUS, DIFFERENTIAL EQUATIONS	MAT102
в тесн	ME	PARTIAL DIFFERENTIAL EQUATION AND COMPLEX	MAT201

PRINCIPAL IANGALAM COLLEGE OF ENGINEERING Ettumanoor



KERALA TECHNOLOGICAL UNIVERSITY

Curriculum for Semesters I and II

2015

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

MANGALAM COLLEGE OF ENGINEERING Ettumanoor

SEMESTER I

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

Page 2 of 6

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.
- 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

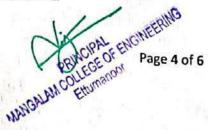
3. The six basic engineering workshops will be connected with the Introductory or Basics of Engineering courses offered. The students should attend two workshops in Semester 1 and two in Semester 2.

For example, students opting Introduction to <u>Civil Engineering</u> or Basics of Civil Engineering should attend the <u>Civil Engineering</u> Workshop, students opting Introduction to <u>Mechanical</u> Engineering or Basics of Mechanical Engineering should attend the <u>Mechanical Engineering</u> Workshop, students opting Introduction to <u>Chemical Engineering</u> should attend the <u>Chemical</u> Engineering Workshop and students opting Introduction to <u>Computing and Problem Solving</u> should attend the <u>Computer Science</u> 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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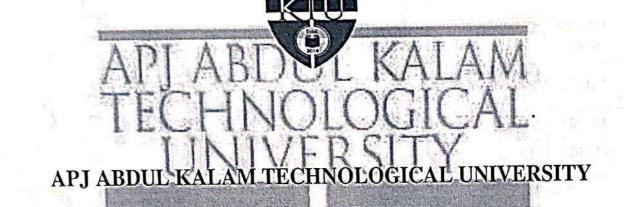
Page 5 of 6

SEMESTER II

Slot	Course No.	Subject	L	-T-P	Hours	Credi
A	MA102	Differential Equations		1-0	4	4
В	PH100	Engineering Physics	3-	1-0.	4	4
(1/2)	CY100	Engineering Chemistry	3-1	1-0	4	4
С	BE100	Engineering Mechanics	3-1	-0	4	4
(1/2)	BE110	Engineering Graphics	1-1	-2	4	3
D	BE102	Design & Engineering	2-0-		4	3
	CE 100	Basics of Civil Engineering	2-1-	0	3	3
E, F	ME 100	Basics of Mechanical Engineering	2-1-	0	3	3
(2/4)	EE 100	Basics of Electrical Engineering	2-1-(3	3
	EC 100	Basics of Electronics Engineering	2-1-0		3	3
S	PH110	Engineering Physics Lab	0-0-2		2	1
(1/2)	CY110	Engineering Chemistry Lab	0-0-2	2		1
T (2/4)	CE110/ME110/ EE110/EC110	Basic Engineering Workshops	0-0-2 +	2		1
U		U100 Language lab / Bridge courses/	0-0-2	2		1
		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	Activ	

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.

NANGALAM COLLEGE OF ENGINEERING



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

Phone +91 471 2598122, 2598422 Fax +91 471 2598522 Web: ktu.edu.in Email: university@ktu.edu.in

RINCIPAL MANGALAM COLLECE OF ENGINEERING Ettumanoor

SEMESTER - 3

Course Code	ADI ADDI	L-T-P	Credits	Exam Slot
MA201	Linear Algebra & Complex Analysis	3-1-0	KA-	LAA
ME201	Mechanics of Solids	3-1-0-	1 Juli	
ME203	Mechanics of Fluids	3-1-0	CIT	N ^B
ME205	Thermodynamics	3-1-0	341	TC
ME210	Metallurgy & Materials Engineering	3-0-0	4	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	A A A A A A A A A A A A A A A A A A A
otal Crec	lits = 24 Hours: 28/29	- AND ADDREEDER	tive Cred	T its= 71

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SEMESTER - 4

Course Code	Course Name	L-T-P	Credits	Exam Slot
MA202	Probability Distributions, Transforms and Numerical Methods	td.	4	A
ME202	Advanced Mechanics of Solids	3-1-0	1000	The state of the s
ME204	Thermal Engineering	3-1-0	4	В
ME206	Fluid Machinery	ALC: SUPERIOR	4	C
ME220	Manufacturing Technology 20	2-1-0	/3	D
HS210/ HS200	Life Skills/Business Economics	3-0-0	3	F
ME232	Thermal Engineering Lab	3-0-0 0-0-3	1	S
ME230	Fluid Mechanics & Machines Lab	0-0-3	1	
Total Cred	dite = 22	Score in a constraint	ve Credit	T s= 94 Portorpal Fortore of en GRUAN COLLEGE OF EN
	2			A CULEGE OF E
	a feither and a second s		tan	Galan Eu
	and the second		1 1 1 1	

SEMESTER - 5

Course	Course Name	L-T-P	Credits	Exam	-
Code	APT ARDI	TT	KA	T SIOT	A
ME301	Mechanics of Machinery	3-1-0		(ČAĂ	
ME303	Machine Tools and Digital Manufacturing	3-0-0	C PT	YB .	TE:
ME305	Computer Programming & Numerical Methods	2-0-1	3	C	
EE311	Electrical Drives &Control for Automation	3-0-0	3	D	alert well
HS300	Principles of Management	. 3-0-0	3	Е	ALL IN
	Elective 1	3-0-0	- 3	F	Service Se
ME341	Design Project	0-1-2	2	S	
EE335	Electrical and Electronics Lab	0-0-3	1	Ţ	
ME331	Manufacturing Technology Lab I	0-0-3	1	U	
Total Cr	edits = 23 Hours: 28	Cumu	lative Cre	dits= 117	

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

MANGALAM COLLEGE OF ENGINEERING Etiumanper

SEMESTER - 6

Course Code	A DCourse Name DI	L-T-P	Credits	Exam Slot
ME302	Heat & Mass Transfer	3-1-0	C4I	C AL
ME304	Dynamics of Machinery	2-1-0-	13-1	7 B
ME306	Advanced Manufacturing Technology	3-0-0	3	l 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

credits= 140

Estd.

NANGALAN COLLEGE OF ENGINEERING

Elective 2:-

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

SEMESTER - 7

Course Code	A DI A R DI T	E-T-P	Credits	Exam Slo
ME401	Design of Machine Elements	3-1-0	411	- Ai
ME403	Advanced Energy Engineering	3-0-0	-3	7B1
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
ž.	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.

Elective 3:-

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

PRINCIPAL MANGALAM COLLEGE OF ENGINEERING Ettumaneer

SEMESTER - 8 Course Course Name Code Exam Slot Credits Design of Machine Elements ME402 3-0-0 3 Industrial Engineering ME404 3-0-0 3 В Elective 4 3-0-0 3 С Elective 5 (Non Departmental) 3-0-0 3 D ME492 Project Total Credits = 18 6 S 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 Micro and Nano Manufacturing 6. ME474 7. ME476 Material Handling & Facilities Planning 2014 WANGALANI COLLEGE OF ENCINEERING

BRANCH: Mechanical Engineering

ELECTIVE 5 (NON DEPARTMENTAL ELECTIVE COURSES)

(Note: - If a student has studied or chosen the elective course given within the brackets then the

Note: - If a	I sindent has sindled of chosen the creative course great
	API ABDULKALAM
1. AO482	FEIGHT AGAIST-GRAVITY OLOGICAL
2. AE482	INDUSTRIAL INSTRUMENTATION R SITU
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 2014
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

PRINCIPAL MANGALAM COLLEGE OF ENGINEERING Ettumanoor

23. EE488	INDUSTRIAL AUTOMATION (ME464/ ROBOTICS AND AUTOMATION)
24. EE494	INSTRUMENTATION SYSTEMS
25. EC482	BIOMEDICAL ENGINEERING
26. FT482	FOOD PROCESS ENGINEERING
27. FT484	EOOD STORAGE ENGINEERING
28. FT486	FOOD ADDITIVES AND FLAVOURING
29.IE482	FINANCIAL MANAGEMENT FD CITY
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





KERALA TECHNOLOGICAL UNIVERSITY

Curriculum for Semesters I and II

2015

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

MANGALAM COLLEGE OF ENGINEERING Ettumanoor

SEMESTER I

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Slot	Course No.	Subject	L-T-P	Hours	Credit
Α	MA101	Calculus	3-1-0	4	4
в	PH100	Engineering Physics	3-1-0	4	4
(1/2)	CY100	Engineering Chemistry	3-1-0	4	4
С	BE100	Engineering Mechanics	3-1-0	4	4
(1/2)	BE110	Engineering Graphics	1-1-2	4	3
D	BE101-0X	Introduction to Engineering	2-1-0	3	3
Ε	BE103	Introduction to Sustainable Engineering	2-0-1	3	3
13	CE100	Basics of Civil Engineering	2-1-0	3	3
F	ME100	Basics of Mechanical Engineering	2-1-0	3	3
(1/4)	EE100	Basics of Electrical Engineering	2-1-0	3	3
	EC100	Basics of Electronics Engineering	2-1-0	3	3
S	PH110	Engineering Physics Lab	0-0-2	2	1
(1/2)	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	1
U		U100 Language lab/ Bridge courses/ Remedial programmes/Micro Projects etc	0-0-3	3	1
	98. C.			30	24/23
v	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	V100 Entrepreneurship/TBI/NCC/NSS/ Physical Edn. etc	0-0-2	2	Activity points

Page 2 of 6

WANGALAM COLLEGE OF ENGINEERING Ethumanoor

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
- 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
 Buffding 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

Page 3 of 6 MANBALAM COLLEGE OF 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 <u>Civil Engineering</u> or Basics of Civil Engineering should attend the *Civil Engineering Workshop*, students opting Introduction to <u>Mechanical</u> Engineering or Basics of Mechanical Engineering should attend the Mechanical Engineering Workshop, students opting Introduction to <u>Chemical Engineering</u> should attend the Chemical Engineering Workshop and students opting Introduction to <u>Computing and Problem Solving</u> 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.

Page 4 of 6 WANGALAM COLLEGE OF ENGINEERING

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.

MANGALAM COLLEGE OF ENGINEERING

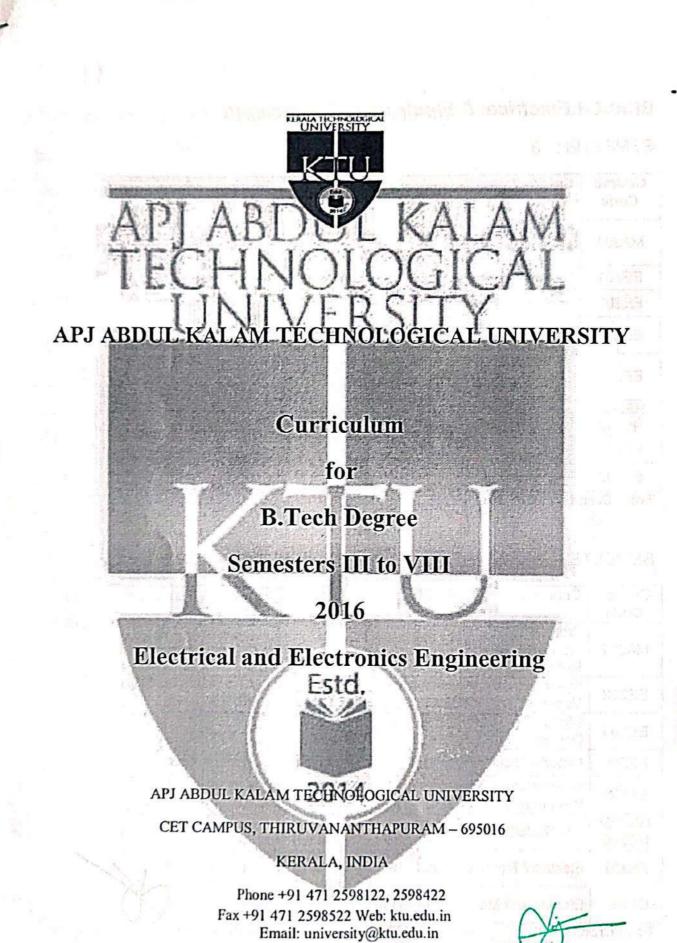
SEMESTER II

Slot	Course No.	Subject	L-T	'-P	Hours	Credi
Α	MA102	Differential Equations	3-1-	.0	4	4
В	PH100	Engineering Physics	3-1-		4	
(1/2)	CY100	Engineering Chemistry	3-1-	_	4	4
С	BE100	Engineering Mechanics	3-1-0		4	4
(1/2)	BE110	Engineering Graphics	1-1-2		4	3
D	BE102	Design & Engineering	2-0-2		4	3
	CE 100	Basics of Civil Engineering	2-1-0		3	3.
E, F	ME 100	Basics of Mechanical Engineering	2-1-0	1 17.3	3	3
(2/4)	EE 100	Basics of Electrical Engineering	2-1-0	3		3
	EC 100	Basics of Electronics Engineering	2-1-0	3		3
S	PH110	Engineering Physics Lab	0-0-2	2		1
(1/2)	CY110	Engineering Chemistry Lab	0-0-2	2		1
T (2/4)	CE110/ME110/ EE110/EC110	Basic Engineering Workshops	0-0-2 + 0-0-2	2		1
U		U100 Language lab / Bridge courses/ Remedial programmes/Micro Projects etc	0-0-2	2	2	
				30	24/	23
v		V100 Entrepreneurship /TBI/NCC/NSS/ Physical Edn. etc	0-0-2	2	Activ poin	

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.

Page 6 of 6

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MANGALAM COLLEGE OF ENGINEERING

SEMESTER - 3

Course	Course Name	L-T-P	Credits	Exam
Code	ADI ARDI	TT	VA	T Slot
MA201	Linear Algebra & Complex Analysis	3-1-0-	4-	A
EE201	Circuits and, Networks	3-1-0-	/41	В
EE203	Analog Electronic Circuits	. 311-0	4	Vc
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 T

SEMESTER - 4

Course Name	L-T-P	Credits	Exam Slot
Probability Distributions, Transforms and Numerical Methods	3-1-0	4	A
Synchronous and Induction	10 3-1-0	4	В
Digital Electronics and Logic Design	2-1-0	3	C
Material Science	3-0-0	3	/ D
Measurements and 20 Instrumentation	18-4-0	4	E
Life Skills/Business Economics	2-0-2/ 3-0-0	3	F
Electrical Machines Lab I	0-0-3	1	S
Circuits and Measurements Lab	0-0-3	1	T
dits = 23 Hours 28/27	Cumula	tive Cred	its= 94
	2		its= 94
	Probability Distributions, Transforms and Numerical Methods Synchronous and Induction Machines Digital Electronics and Logic Design Material Science Measurements and Instrumentation Life Skills/Business Economics Electrical Machines Lab I Circuits and Measurements Lab dits = 23 Hours 28/27	Probability Distributions, Transforms and Numerical Methods3-1-0Synchronous and Induction Machines5-1-0Digital Electronics and Logic Design2-1-0Material Science3-0-0Material Science3-0-0Measurements and Instrumentation20Life Skills/Business Economics2-0-2/ 3-0-0Electrical Machines Lab I0-0-3Circuits and Measurements Lab0-0-3	Probability Distributions, Transforms and Numerical Methods3-1-04Synchronous and Induction MachinesESTCI 3-1-04Digital Electronics and Logic Design2-1-03Material Science3-0-03Material Science3-0-03Material Science3-0-03Life Skills/Business Economics2-0-2/ 3-0-03Electrical Machines Lab L0.0.34

SEMESTER - 5

Course	Course Name	L-T-P	Credits	Exam	1202
Code	ADI ARDI	TT	KΔ	T SIGt	1
EE301	Power Generation, Transmission and Protection	3-1-0-		ICA A	Y.Y
EE303	Linear Control Systems	217-0	C PT	YB	A.
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	E	
EE341	Design Project	0-1-2	2	S	
EE331	Digital Circuits and Embedded Systems Lab	0-0-3		Т	E States
EE333	Electrical Machines Lab II	0-0-3	1	U	3.20

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

3

5.EE369 High Voltage Engineering

PRINCIPAL MANGALAM COLLEGE OF ENGINEERING Ettumanoor

SEMESTER - 6

Course	Course Name	L-T-P	Credits	Exam Slo
Code	APLABDI	TT	KA	IΑΛ
EE302	Electromagnetics	2-1-0	C3.	CAI
EE304	Advanced Control Theory	3-1-0	14	Гв
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	Ē
	Elective 2	3-0-0	3	F
EE332	Systems and Control Lab	-0-0-3		S
EE334	Power Electronics and Drives Lab	0-0-3	1-1-1-1	T
EE352	Comprehensive Exam	0-1-1	2	U

Estd Cumulative Credits= 140

Elective 2:-

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

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SEMESTER - 7

Electronic communication Distributed generation and smart grids Electrical system design Digital Signal Processing	2-1-0 3-0-0 3-1-0		
Distributed generation and smart grids Electrical system design	3-1-0		
grids Electrical system design	3-1-0		C C
	and the second second	4)	С
Digital Signal Processing	State State	Surgitude Area and	alles all quette part of a set
Digital Signal Tocessing	3-0-0	3	D
Electrical Machine Design	3-0-0	3	E
Elective 3	3-0-0	3	F
Seminar & Project Preliminary	0-1-4	2	S
Power system Lab	0-0-3	1	Τ
	Elective 3 Seminar & Project Preliminary Power system Lab	Elective 3 3-0-0 Seminar & Project Preliminary 0-1-4 Power system Lab 0-0-3	Elective 33-0-03Seminar & Project Preliminary0-1-42Power system Lab0-0-31

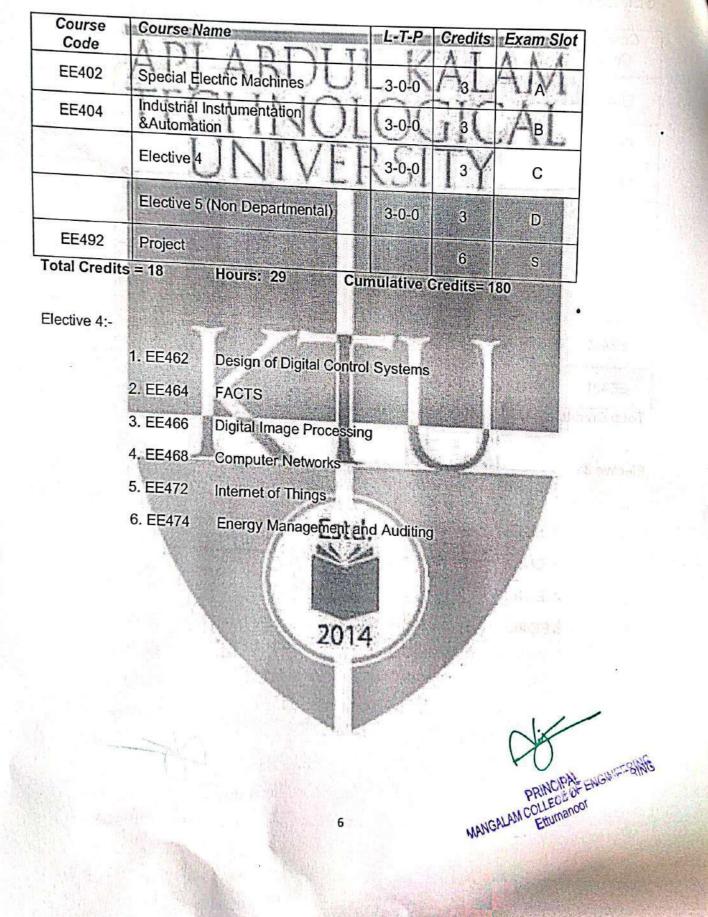
Elective 3:-

1. EE461	Modern Operating Systems
0 55400	O
2. EE463	Computer Aided Power Systems Analysis

- Power Quality 3. EE465
- Nonlinear Control Systems 4. EE467
- Electric and Hybrid Vehicles 5.EE469

MANGALAM COLLEGE OF ENGINEERING Ettumanoor

SEMESTER - 8



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)

FLIGHT AGAIST GRAV 1. AO482 INSTRUMENTATION SYSTEM DESIGN 2. AE484 NOISE, VIBRATION AND HARSHNESS 3. AU486 BIOMEDICAL INSTRUMENTATION(EE 372 BIOMEDICAL 4. BM482 INSTRUMENTATION) MEDICAL IMAGING & IMAGE PROCESSING TECHNIQUES 5. BM484 DESIGN OF BIOLOGICAL WASTEWATER SYSTEMS 6. BT461 SUSTAINABLE ENERGY PROCESSES 7. BT362 PROCESS UTILITIES AND PIPE LINE DESIGN 8. CH482 FUEL CELL TECHNOLOGY 9 CH484 ENVIRONMENTAL IMPACT ASSESSMENT 10. CE482 APPLIED EARTH SYSTEMS 11.CE484 GEO INFORMATICS FOR INFRASTRUCTURE MANAGEMENT 12.CE486 DISASTER MANAGEMENT 13.CE488 ENVIRONMENT HEALTH AND SAFETY 14. CE494 DATA STRUCTURES (EE 362 DATA STRUCTURES AND ALGORITHMS) 15.CS482 COMPUTER GRAPHICS 16.CS484 OBJECT ORIENTED PROGRAMMING (EE 3610BJECT ORIENTED 17.CS486 PROGRAMMING) C # AND .NET PROGRAMMING 18.CS488 **BIOMEDICAL ENGINEERING** 19. EC482 FOOD PROCESS ENGINEERING 20. FT482 MANGALAM COL FOOD STORAGE ENGINEERING 21. FT484

GE OF ENGINEERING

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22. FT486	FOOD ADDITIVES AND FLAVOURING
23.IE482	FINANCIAL MANAGEMENT
24. IE484	INTRODUCTION TO BUSINESS ANALYTICS
25.IE486	DESIGN AND ANALYSIS OF EXPERIMENTS AT ANA
26. IE488	TOTAL QUALITY MANAGEMENT.
27.IC482	BIOMEDICAL SIGNAL PROCESSING UICAL
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 Estd.
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

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

MANGALAM COLLEGE OF ENGINEERING Ettumanoor

SEMESTER I

Slot	Course No.	Subject	L-T-P	Hours	Credits
Α.	MA101	Calculus	3-1-0	4	4
в	PH100	Engineering Physics	3-1-0	4	4
(1/2)	CY100	Engineering Chemistry	3-1-0	4	4
С	BE100	Engineering Mechanics	3-1-0	4	4
(1/2)	BE110	Engineering Graphics	1-1-2	4	3
D	BE101-0X	Introduction to Engineering	2-1-0	3	3
Ε	BE103	Introduction to Sustainable Engineering	2-0-1	3	3
	CE100	Basics of Civil Engineering	2-1-0	3	3
F	ME100	Basics of Mechanical Engineering	2-1-0	3	14940.
(1/4)	EE100	Basics of Electrical Engineering	2-1-0	3	3
	EC100	Basics of Electronics Engineering	2-1-0	3	3
s	PH110	Engineering Physics Lab	0-0-2	2	3
(1/2)	CY110	Engineering Chemistry Lab	0-0-2	2	1
T (2/4)	CE110/ME110/ EE110/EC110/	Basic Engineering Workshops (CS110 for CS and related branches and	0-0-2	2	1
(CS110/CH110	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

MANGALAM COLLEGE OF ENGINEERING Etiumanoor Page 2 of 6

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.
- 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

Page 3 of 6 MANGALAM CO OF ENGINEERING Ettumanoor

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 <u>Critl</u> Engineering or Basics of Groll Engineering should attend the *Grol Engineering Workshop*, students opting Introduction to <u>Mechanical</u> Engineering or Basics of Mechanical Engineering should attend the Mechanical Engineering Workshop, students opting Introduction to <u>Chemical Engineering</u> should attend the *Chemical* Engineering Workshop and students opting Introduction to <u>Compating and Problem Solving</u> should attend the *Compater 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 Chemisury and Chemisury 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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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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MANGALAMCO ENGINEERING

Page 5 of 6

Slot	IESTER II Course No.	Subject	L-T-P	Hours	Credits
5101			3-1-0	4	4
Α	MA102	Differential Equations	3-1-0	4	4
В	РН100 •	Engineering Physics		4	4
(1/2)	CY100	Engineering Chemistry	3-1-0	15	
С	BE100	Engineering Mechanics	3-1-0	4	4
(1/2)	BE110	Engineering Graphics	1-1-2	4	3
D	BE102	Design & Engineering	2-0-2	4	3
	CE 100	Basics of Civil Engineering	2-1-0	3	3
E, F	• ME 100	Basics of Mechanical Engineering	2-1-0	3	3
(2/4)	EE 100	Basics of Electrical Engineering	2-1-0	3	3
(2/4)	EC 100	Basics of Electronics Engineering	2-1-0	3	3
S	PH110	Engineering Physics Lab	0-0-2	2	1
(1/2)	CY110	Engineering Chemistry Lab	0-0-2	2	1
	0001100		0-0-2	2	1
T	CE110/ME110/ EE110/EC110	Basic Engineering Workshops	+		
(2/4)	EE110/EC110		0-0-2	2	1
U		U100 Language lab / Bridge courses/ Remedial programmes/Micro Projects etc	0-0-2	2	
			P - 1	30	24/23
v	a.	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.

ENG Page 6 of 6 MANGALAM COLLEGA OF



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

KERALA, INDIA

Phone +91 471 2598122, 2598422 Fax +91 471 2598522 Web: ktu.edu.in Email: university@ktu.edu.in

MANGALAM COLLENE OF ENGINEERING

BRANCH:*Electronics* & *Communication Engineering*

SEMESTER - 3

Course Name	L-T-P	Credits	Exam
ADT ADDT	TT	VA	T Slot
Linear Algebra & Complex Analysis	3-1-0-	X	AN
Network Theory	3-1-0_	Ma	LBA
Solid State Devices	- 3-1-0	41	Vc
Electronic Circuits	3-1-0	4	D
Logic Circuit Design	3-0-0	3	E
Business Economics/Life Skills	3-0-0/ 2-0-2	3	F
Electronic Devices & Circuits Lab	0-0-3	1	S
Electronic Design Automation Lab	0-0-3	1	T
Ele	ctronic Design Automation	ctronic Design Automation 0-0-3	ctronic Design Automation 0-0-3 1

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	В
EC204	Analog Integrated Circuits	4-0-0	4	С
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	Т

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

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PRINCIPAL WANGALAM COLLEGE OF ENGINEERING Ettumanoor

BRANCH!

BRANCH: Electronics & Communication Engineering

SEMESTER - 5

Course	Course Name	L-T-P	Credits	Exam	-
Code	ADIARDI	TT	VA	ISION	1
EC301	Digital Signal Processing	3-1-0-	NAT.	AA	Y
EC303	Applied Electromagnetic Theory	-3-0-0	CPT	YB	
EC305	Microprocessors & Microcontrollers	3-0-0	3	C	and and a second
EC307	Power Electronics & Instrumentation	3-0-0	3	D	「「
HS300	Principles of Management	3-0-0	3	E	
10th	Elective 1	3-0-0	3	E	
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 ative Cred	U	

Total Credits

Elective 1:-	1	EC361	Den D	iai	ital
		YSTEME			5.220

- Optimization Techniques 2. EC363
- Biomedical Engineering 3. EC365
- Soft Computing 2014 4. EC360

3

System Design

PRINCIPAL MANGALAM COLLEGE OF ENGINEERING Ettumanoor

BRANCH: Electronics & Communication Engineering

BRANCHERESTE

SEMESTER - 6

A series a state	L-T-P	Credits	Exam Slot
APLARDU	TI	CA	A No
Digital Communication	4-0-0	Č41	A Y
VLSI UNIVE	3-0-0		V B
	A News	1. 1	L
Antenna & Wave Propagation	3-0-0	3	С
Embedded System		And And And	
	3-0-0	3	D
Object Oriented Programming	3-0-0	3	^{av} E
Elective 2	ANGERSA DES		0 0 0 0 0
Communication	3-0-0	3	F
(Analog& Digital)	-0-0-3	1	and the market of the second
and the second se	4	A Contraction	S
And a second	0-0-3	1-	T
lits = 23 Hours: 27	0-1-1	2	U
	VLSI UNIVE Antenna & Wave Propagation Embedded System Object Oriented Programming Elective 2 Communication Engg Lab (Analog& Digital) Microcontroller Lab Comprehensive Exam	VLSI Jie Constraints Antenna & Wave Propagation 3-0-0 Antenna & Wave Propagation 3-0-0 Embedded System 3-0-0 Object Oriented Programming 3-0-0 Elective 2 3-0-0 Communication Engg Lab 0-0-3 Microcontroller Lab 0-0-3 Comprehensive Exam 0-1-1	VLSIUNIVE3-0-03Antenna & Wave Propagation3-0-03Embedded System3-0-03Object Oriented Programming3-0-03Elective 23-0-03Communication Engg Lab0-0-31Microcontroller Lab0-0-31Comprehensive Exam0-1-12

Elective 2:-

1. EC362 Modelling & Simulation of Communication Systems

MANGALAM COLLEGE OF ENGINEERING

- 2. EC366 Real Time Operating Systems
- 3. EC368 Robotics

4. EC370 Digital Image Processing

BRANCH: Electronics & Communication Engineering

SEMESTER - 7

Course	Course Name	L-T-P	Gredits	Exam Slo
Code	ADI ABDI	TF W	AT	AKJ
EC401	Information Theory & Coding	公支		F X Y
EC403	Microwave & Racar Engg	14300	Jall	C'AL
EC405	Optical Communication	- 16-3-1	co.	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	Т
Fotal Cred	its = 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 2014

PRINCIPAL MANGALAM COLLEGE OF ENGINEERING Ettumanoer

- 24. FT484 FOOD STORAGE ENGINEERING
- 25. FT486 FOOD ADDITIVES AND FLAVOURING
- 26.IE482 FINANCIAL MANAGEMENT
- 27. IE484 INTRODUCTION TO BUSINESS ANALYTICS ALAA 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)

Estd.

8

- 39.MP482 PRODUCT DEVELOPMENT AND DESIGN
- 40. MP469 INDUSTRIAL PSYCHOLOGY & ORGANIZATIONAL BEHAVIOUR
- 41. MP484 PROJECT MANAGEMENT
- 42. MT482 INDUSTRIAL SAFETY
- 43. MR482 MECHATRONICS
- 44. FS482 RESPONSIBLE ENGINEERING
- 45. SB482 DREDGERS AND HARBOUR CRAFTS
- 46. HS482 PROFESSIONAL ETHICS

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KERALA TECHNOLOGICAL UNIVERSITY

Curriculum for Semesters I and II

2015

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

MANGALAM COLLEGE OF ENGINEERING

SEMESTER I

Slot	Course No.	Subject	L-T-P	Hours	Credit
A	MA101	Calculus	3-1-0	4	4
B	PH100	Engineering Physics	3-1-0	4	4
(1/2)	CY100	Engineering Chemistry	3-1-0	4	4
C	BE100	Engineering Mechanics	3-1-0	4	4
(1/2)	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
r	CE100	Basics of Civil Engineering	2-1-0	3	3
F	ME100	Basics of Mechanical Engineering	2-1-0	3	3
(1/4)	EE100	Basics of Electrical Engineering	2-1-0	3	3
	EC100	Basics of Electronics Engineering	2-1-0	3	3
S	PH110	Engineering Physics Lab	0-0-2	2	1
(1/2)	CY110	Engineering Chemistry Lab	0-0-2	2	1
T (244)	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 +	2	1
υ		U100 Language lab/ Bridge courses/ Remedial programmes/Micro Projects etc	0-0-2 0-0-3	2 3	1
				30	24/23
v		V100 Entrepreneurship/TBI/NCC/NSS/ Physical Edn. etc	0-0-2	2	Activity points

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Notes:

 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.
- 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

Page 3 of 6 OF ENGINEERING MANGALAM COL Ettumanoor

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 <u>Ciril</u> Engineering or Basics of Civil Engineering should attend the *Ciril Engineering Workshop*, students opting Introduction to <u>Mechanical</u> Engineering or Basics of Mechanical Engineering should attend the Mechanical Engineering Workshop, students opting Introduction to <u>Chemical</u> Engineering should attend the *Chemical Engineering Workshop* and students opting Introduction to <u>Chemical Engineering and Problem Solving</u> should attend the *Chemical Engineering Workshop* and students opting Introduction to <u>Computing and Problem Solving</u> should attend the *Chemical Engineering Workshop* and students opting Introduction to <u>Computing and Problem Solving</u> 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.

Page 4 of 6 NANGALAM COLLE

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.

Page 5 of 6 MANGALAM COLLEGE OF ENGINEERING

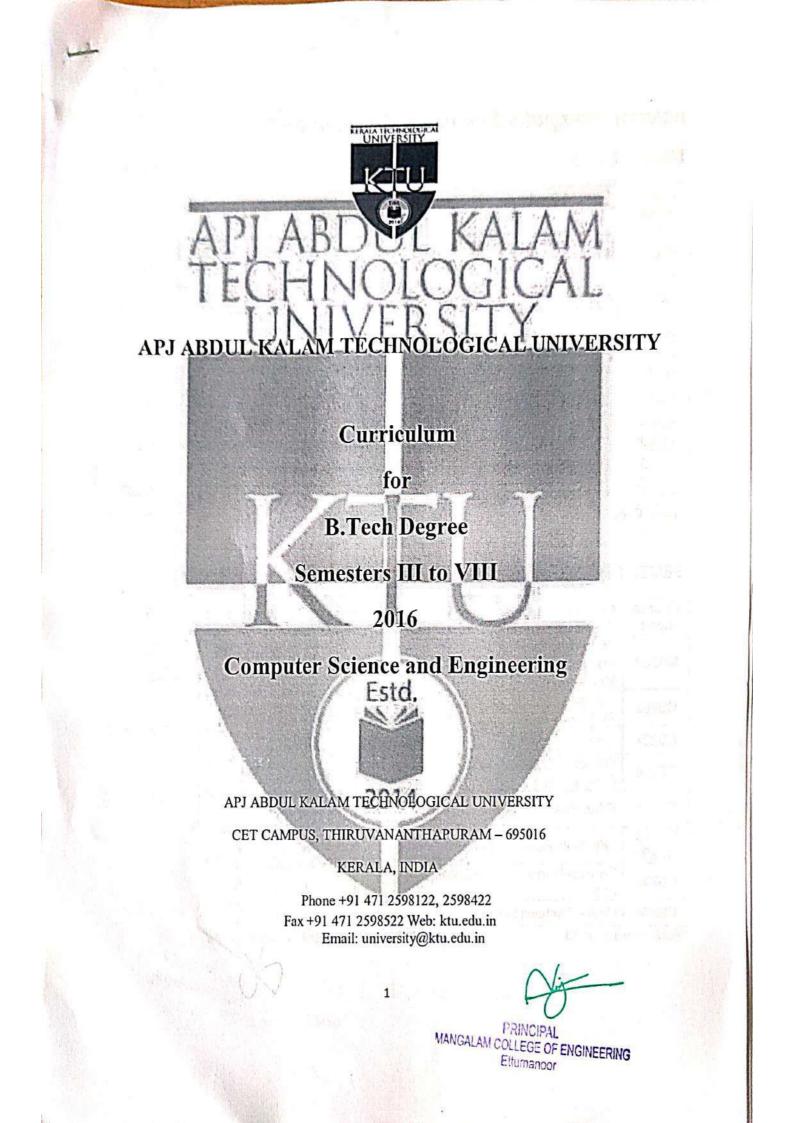
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SEMESTER II

Slot	Course No.	Subject	L-T-P	Hours	Credi
A	MA102	Differential Equations	3-1-0	4	4
в	PH100	Engineering Physics	3-1-0	4	4
(1/2)	CY100	Engineering Chemistry	3-1-0	4	4
С	BE100	Engineering Mechanics	3-1-0	4	4
(1/2)	BE110	Engineering Graphics	1-1-2	4	3
D	BE102	Design & Engineering	2-0-2	4	3
	CE 100	Basics of Civil Engineering	2-1-0	3	3
E, F	ME 100	Basics of Mechanical Engineering	2-1-0	3	3
(2/4)	EE 100	Basics of Electrical Engineering	2-1-0	3	3
	EC 100	Basics of Electronics Engineering	2-1-0	3	3
S	PH110	Engineering Physics Lab	0-0-2	2	1
(1/2)	CY110	Engineering Chemistry Lab	0-0-2	2	1
T (2/4)	CE110/ME110/ EE110/EC110	Basic Engineering Workshops	0-0-2 +	2	1
U	· · · · · · · · · · · · · · · · · · ·	U100 Language lab / Bridge courses/ Remedial programmes/Micro Projects etc	0-0-2	2	1
	decen .			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.

NANGALAM COLLEGE OF ENOTHERENNG



SEMESTER - 3

Course Code	Course Name	L-T-P	Credits	Exam
oode	API ARI)		K A	A
MA201	Linear Algebra & Complex Analysis	3-1-0	147	TAA
CS201	Discrete Computational Structures	1-3-1-0	EAT	VB
CS203	Switching Theory and Logic V Design	3-1-0		<u> </u>
CS205	Data Structures	3-1-0	4	D
CS207	Electronics Devices & Circuits	ALL	and the second	
HS210/	and the second	3-0-0	3	E
HS200	Life Skills/Business Economics	2-0-2/	3	F
CS231	A STATE OF A	3-0-0		Carl & Same Contract
	Data Structures Lab	0-0-3	1	S
CS233	Electronics Circuits Lab	0-0-3	1	The second se
otal Cred	lits = 24 Hours: 28/29	0-0-5		

SEMESTER - 4

Course Code	e Course Name	L-T-P	Credits	Exam Slot
MA202	Methods	3-1-0	4	A
CS202	Computer Organization and Architecture	3-1-0	4	B
CS204	Operating Systems	3-1-0		And
CS206	Object Oriented Design and Programming	2-1-0	4	C 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	0-0-3	1	S
CS234	Digital Systems Lab	0-0-3	1	Т
otal Cred	lits = 23 Hours 28/27	Contraction of the second	ulative Cr	edits= 94

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MANGALAN COLLEGE OF ENGINEERING Ettumancor

BMGMEERING

Course Code	Course Name ADD	110	Gredits	Exam Slot
C\$301	Theory of Computation	-371,0	七十	YA.
CS303	System Software	2-1-0-	$\frac{3}{211}$	- в
CS305	Microprocessors and Microcontrollers	2-1-0	3	С
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	Jr
CS333	Application Software Development Lab	0-0-3	1	U
otal Cred	its = 23 Hours: 29 Es	Cumulat td.	ive Credi	s= 117

Signals and Systems 2. CS363

- Optimization Techniques 3. CS365
- 4. CS367 Logic for Computer Science

5. CS369 Digital System Testing & Testable Design

MANGALAM COLLEGE OF ENGINEERING

3

SEMESTER - 6

Course	Course Name	L-T-P	Credits	Exam Slo
Code	API ABDI	II I	KA	AN
CS302	Design and Analysis of Algorithms	3-1-0	GI	CAI
CS304	Compiler Design	3.0-05	13	Ýв
CS306	Computer Networks	3-0-0	3	С
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	Transie
CS352	Comprehensive Exam	0-1-1	2	U

Elective 2:-

1. CS362	Computer Vi	sion
	And the second second second second	

- 2. CS364 Mobile Computing 2014
- 3. CS366 Natural Language Processing
- 4. CS368 Web Technologies
- 5. CS372 High Performance Computing

WANGALAN COLLEGE OF ENGINEERING

SEMESTER - 7

Course	Course Name	L-T-P	Credits	Exam Slo
Code	API ARINI	K	Δ	AN
CS401	Gomputer Graphics	4-0-0	41	A
CS403	Programming Paradigms	3-0-0,	131	FBL
CS405	Computer System Architecture	3-0-0	3	С
CS407	Distributed Computing	3-0-0	-3	D
CS409	Cryptography and Network Security	3-0-0	3	Е
	Elective 3	3-0-0	3	F
CS451	Seminar & Project Preliminary	0-1-4	2	S
CS431	Compiler Design Lab	0-0-3	1	Т
Total Cre	dits = 22 Hours: 27	Cumul	ative Cre	dits= 162

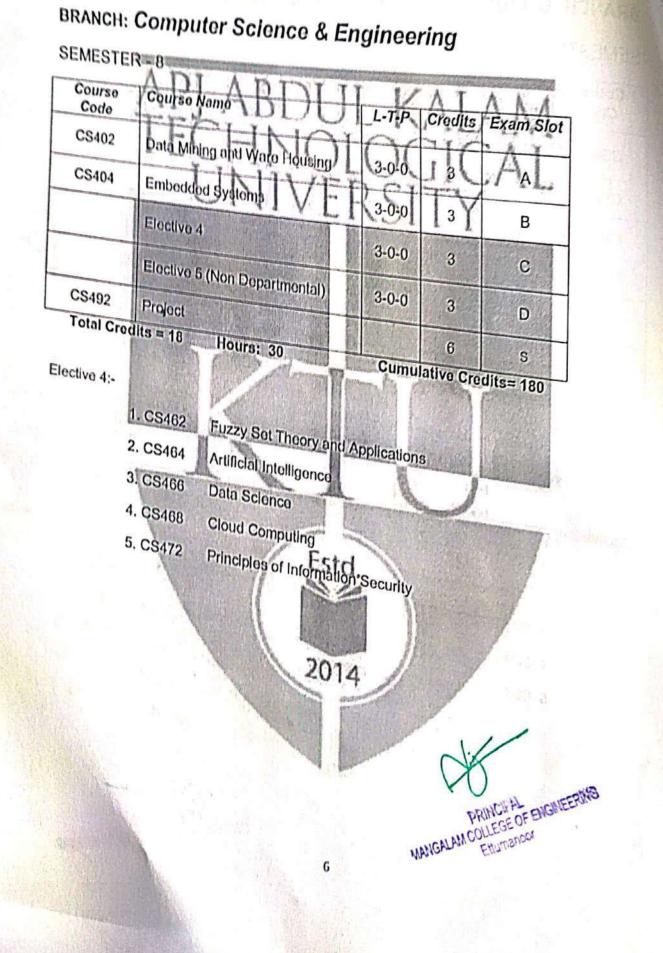
Elective 3:-

1. CS461	Computational Geometry
2. CS463	Digital Image Processing
3. CS465	Bio Informatics
No. a la la	And a second

- 4. CS467 Machine Learning
- 5. CS469 Computational complexity

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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)

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

MANGALAM COLI GE OF ENGINEERING



KERALA TECHNOLOGICAL UNIVERSITY

Curriculum for Semesters I and II

2015

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

GE OF ENGINEERING MANGALAM C Ettumanoor

SEMESTER I

Slot	Course No.	Subject	1T-P	Heans	Orelits
A	MAI01	Calculus	3-1-0	3-1-0 4	
в	PH100	Elgennering Physics	3-1-0	1	4
(1/2)	CY100	Electronity Chemister	3-1-0	4	1
с	BE100	Eleptineering Meethanits	3-1-0	4	4
(1/2)	BE110	Elpenneerige Orgethis	1-1-2	4	3
D	BE101-0X	international international	24.4	3	3
E	BE103	adversion of Administra of a minerater rand	240-1	3	3
	CE100	Resits of Civil Elgeneering	21.0	3	3
F	ME100	Basics of Merchanical Electrority	240	3	3
(1/4)	EE100	Basics of Electrical Electricality	24.0	3	3
	EC100	Basics of Electronics Elgencerity	2-1-0	3	3
S	PH110	Engineering Physics Lab	0.02	2	1
(1/2)	CY110	Engineering Chemistry Lab	0.02	2	1
T (2/4)	CE110/ME110/ EE110/EC110/	Basic Engineering Workshops (CS110 for CS and related branches and	0.02	2	1
(2.4)	CS110/CH110	CH110 for CH and related branches only)	0.02	2	1
U	Q Å	U100 Language lab/ Bridge courses/ Remedial programmes/Micro Projects etc	0.0.3	3	
57			Construction of the second	30	N/23
v		V100 Entrepreneurship/TBI/NCC/NSS/ Physical Edn. etc	0.0.2		etivity vints

HANGALAN COLLEGE OF CHENNEPRIND

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

- 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

Page 3 of 6

MANGALAM COLLEGE OF ENGINEERING Elismanoor

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 <u>Civil Engineering</u> 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.

MANGALAM COLLEGE OF ENGINEERIND

Page 4 of 6

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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.

CURRICULUM I TO VIII: B.TECH CIVIL ENGINEERING

SI.	se of B. Tech. Program shall be placed in one of the nine categories Category	Code	Crean
No	ADLARDIN KA	AA	s A V L 8
1	Humanities and Social Sciences including Management	BSG	26
2	Basic Science courses	Manager & B	. Inna
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	J	162
10	Value Added Course (Optional)	VAC	20

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

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		20	114		50		-
Credits for Activity				-2			and the second se		2
G.Total	-		Tadi i			and the second second			102

MANGALAM COLLEGE OF ENGINEERING

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					
Т	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.)					
Ν	Non-credit courses					
D	Project based courses (Major, Mini Projects)					
Q	Seminar Courses					

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





Departments

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

Table 2: Departments and their codes Course SL. ourse Prefix Departmen SL Department NO Prefix NO FT Food Technology 20 AO, Aeronautical Engg 1 1 HU Humanities Applied Electronics & 21 AE 2 Instrumentation IE Industrial Engg 22 AI Artificial Intelligence 3 IT Information Technology Artificial Intelligence & Data 23 AD 4 Science IC Instrumentation & Control 24 AU Automobile 5 MC Mandatory Courses 25 BM Biomedical Engg 6 MA Mathematics 26 BT Biotechnology 7 ME Mechanical Engg 27 CH Chemical Engg 8 MR 28 Mechatronics CY Chemistry 9 MT Metallurgy 29 CE Civil Engg 10 MU Mechanical (Auto) 30 CS Computer Science 11 Computer Science (Artificial MP Mechanical (Prod) CAF 31 12 Intelligence) Computer Science (Artificial Naval & Ship Building SB CM Intelligence & Machine 13 Learning) PH Computer Science (Data 33 Physics CD 14 Science) 34 PO Polymer Engg Computer Science CC 15 Cyber Security



PE

RA

FS

Production Engg

Safety & Fire Engg

Robotics and Automation

35

36

37

EB

EC

EO

EE

Electronics & Biomedical

Electrical and Computer

Electrical & Electronics

Electronics &

Engineering

Communication

16

17

18

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CIVIL ENGINEERING

MESTE		COURSES	L-T-P	HOUR	CREDI
SLO	COURSE		3-1-0	4	4
Т	NO. MAT 101	LINEAR ALGEBRA AND	5-1-0		
A	MAT IOT	CALCULUS	3-1-0	4	4
В	PHT 110	ENGINEERING PHYSICS B	TAT	A 1.	4
1/2	CY1 100	ENGINEERING CHEMISTRY	3-1-0	HAW	1 4
	THI.	A hard hard here has been	2-1-0	3,1	3
С	EST 100"	ENGINEERINGMECHANICS	TL	44	- 3
1/2	EST 110	ENGINEERING GRAPHICS	2-0-2	4	5
		INNIN/LIV	4-0-0	4	4
D	EST 120	BASICS OF CIVIL & MECHANICAL ENGINEERING		- TON AND THE	4
1/2	EST 130	BASICS OF FLECTRICAL &	4-0-0	4	4
	Lot iou	ELECTRONICS ENGINEERING	2-0-2	4	- N
E	HUN 101	LIFE SKILLS	派情報公子		
0	PHL 120	ENGINEERING PHYSICS LAB	0-0-2	2	<mark>ہ</mark> 1
S 1/2			0-0-2	2	1
	CYL 120	ENGINEERING CHEMISTRY LAB			
-	ESL 120	CIVIL & MECHANICAL	0-0-2	2	1
T 1/2	E3L 120	MORKSHOP	0-0-2	2	1
	ESL 130	ELECTRICAL & ELECTRONICS			
		WORKSHOP TOTAL		23/24 *	17
	A Charles				

*Minimum hours per week

NOTE:

To make up for the hours lost due to induction of geram, one extra hour may be 1.00 each course

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allotted to

SEMESTER II

SLO	COURSE NO.	COURSES	L-T-P	HOUR S	CRED T
	NAT 402	VECTOR CALCULUS,	3-1-0	4	4
A	MAT 102	DIEEERENTIAI			£
		EQUATIONS AND TRANSFORMS	3-1-0	入私人	4
B 1/2	PHT 110	ADLOW IN	3-1-0	LI V.	4
1.2	CYT 100	ENGINEERINGCHEMISTRY		A	
С	EST 100	ENGINEERING MECHANICS	2-1-0	1.1° 31. 1.	- 3
1/2	EST 110	ENGINEERING GRAPHICS	2-0-2	4	3
	Environment	There are an	4-0-0	4	4
D	EST 120	BASICS OF CIVIL & MECHANICAL ENGINEERING	a starter	1. 当城。	
1/2	EST 130	BASICS OF ELECTRICAL &	4-0-0	4	4
F	HUN 102	ELECTRONICS ENGINEERING PROFESSIONAL	2-0-2	4	-
Е	HUN 102	COMMUNICATION			
F	EST 102	PROGRAMMING IN C	2-1-2	5	4
S	PHL 120	ENGINEERING PHYSICS LAB	0-0-2	2	1
1/2		A DECEMBER OF THE PROPERTY OF	0-0-2	2	1
	CYL 120	ENGINEERING CHEMISTRY LAB		1	
Т	ESL 120	CIVIL & MECHANICAL WORKSHOP	0-0-2	2	1
1/2	ESL 130	ELECTRICAL & ELECTRONICS	0-0-2	2	1
	1997 B 2129	TOTAL		28/29	21

NOTE:

Estd.

- 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 SI 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 SI 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.

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CIVIL ENGINEERING

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

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

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





SEMESTER III

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	MAT201	PARTIAL DIFFERENTIAL EQUATION AND COMPLEX ANALYSIS	3-1-0	4	4
В	CET201	MECHANICS OF SOLIDS	3-1-0	N4	4
с	CET203	FLUID MECHANICS& HYDRAULICS	3-1-0	Дł	4
D	CET205	SURVEYING & GEOMATICS	4-0-0	4	4
E	EST200	DESIGN & ENGINEERING	2-0-0	2	2
1/2	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
т	CEL203	SURVEY LAB	0-0-3	3	2
R/N	I VAC	Remedial/Minor course	3-1-0	4*	4
		TOTAL		26/30	22/20

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 coes not opt for minor programme, he/she can be given remedial class.



MANGALAM COLLEGE OF ENGINEERING

SEMESTER IV

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDI
A	MAT202	PROBABILITY, STATISTICS AND NUMERICAL METHODS	3-1-0	4	4
В	EFT202	ENGINEERING GEOLOGY	3-0-1	Mal	4
С	CET204	GEOTECHNICAL ENGINEERING - I	4-0-0	4	4
D	CET206	TRANSPORTATION ENGINEERING	4-0-0	4	4
E	EST200	DESIGN & ENGINEERING	2-0-0	2	2
1/2	HUT200	PROFESSIONAL ETHICS	2-0-0	2	2
F	MCN202 •	CONSTITUTION OF INDIA	2-0-0	2	9 4 .
S	CEL202	MATERIAL TESTING LAB- I	0-0-3	3	2
т	CEL204	FLUID MECHANICS LAB	0-0-3	3	2
R/M/H	VAC	Remedial/Minor/Honours course	3-1-0	4*	4
1		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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SCIVI	231	· · · ·	-

COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
		3-1-0	4	4
CE1301	A COMPACT OF STREET, ST	Jack	h 14	4
CET303)	DESIGN OF CONCRETE STRUCTURES	3-1-0	W1	
CET305 2	GEOTECHNICAL ENGINEERING - IT	4-0-0-	A 1	4
ttt	HYDROLOGY & WATER RESOURCES	4-0-0	14	4
CET307	ENGINEERING	200	3	3
CET309	& MANAGEMENT	3-0-0		
MCN301	DISASTER MANAGEMENT	2-0-0	2	-
CEL331	MATERIAL TESTING LAB - II	0-0-3	3	2
	GEOTECHNICAL ENGINEERING LAB	0-0-3	3	2
	Remedial/Minor/Honours course	3-1-0	4*	4
	TOTAL		27/31	23/2
	СЕТ305 СЕТ307 СЕТ309 МСN301 СЕL331 СЕL333	CET301STRUCTURAL ANALYSIS - 1CET303DESIGN OF CONCRETE STRUCTURESCET305GEOTECHNICAL ENGINEERING - IICET307HYDROLOGY & WATER RESOURCESENGINEERING/CONSTRUCTION TECHNOLOGYCET309& MANAGEMENTMCN301DISASTER MANAGEMENTCEL331MATERIAL TESTING LAB - IICEL333GEOTECHNICAL ENGINEERING LABVACRemedial/Minor/Honours course	COURSE NO.COURSESCOURSESCET301STRUCTURAL ANALYSIS – I3-1-0CET303PESIGN OF CONCRETE STRUCTURES31-0CET305GEOTECHNICAL ENGINEERING – II4-0-0CET307HYDROLOGY & WATER RESOURCES ENGINEERING/4-0-0CET309& MANAGEMENT3-0-0MCN301DISASTER MANAGEMENT2-0-0CEL331MATERIAL TESTING LAB – II0-0-3CEL333GEOTECHNICAL ENGINEERING LAB0-0-3HVACRemedial/Minor/Honours course3-1-0	COURSE NO.COURSESL · · · · · · · · · · · · · · · · · · ·

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.



MANGALAM COLLEGE OF ENGINEERING Ettumanoor

SEMESTER VI

CLOT	COURSE NO.	COURSES	L-T-F	» нои	RS CRED
SLOT	COURSE NO.		3-1-0) 4	4
Α	CET302	STRUCTURAL ANALYSIS – II			
в	CET304	ENVIRONMENTAL ENGINEERING	4-0-0	A-A 31	4
С	СБТЗО6	DESIGN OF HYDRAULIC STRUCTURE	5 4-0-0		4
D	CETXXX	PROGRAM ELECTIVE	3-0-0	-M3L	- 3
E	НUТ300	INDUSTRIAL ECONOMICS &	3-0-0	3	3
F	CET308	COMREHENSIVE 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
/м/н	VAC	Remedial/Minor/Honours course	3-1-0	4*	4
	The same starts	TOTAL		25/29	23/27

PROGRAM ELECTIVE I

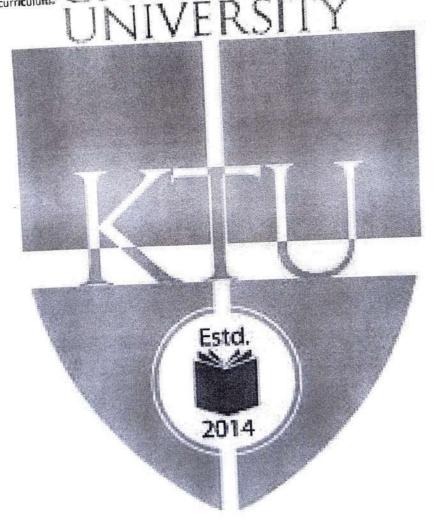
SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
	CET312	ADVANCED COMPUTATIONAL METHODS	3-0-0	T	
	CET322	GEOTECHNICAL INVESTIGATION	3-0-0	3	3
	CET332	TRAFFIC ENGINEERING & MANAGEMENT	3-0-0		
	CET342	MECHANICS OF FLUID FLOW	3-0-0 3-0-0		
C	CET352	ADVANCED CONCRETE TECHNOLOGY	5-0-0		
	ET362	ENVIRONMENTAL IMPACT ASSESSMENT	3-0-0		
c	ET372	FUNCTIONAL DESIGN OF BUILDINGS	3-0-0		



1. **All Institutions should keep 4 hours exclusively for Remedial class/Minor/Honours course NOTE: (Tuesdays from 2 to 4 PM and Wednesdays from 2 to 4 PM). If a student does not opt for

minor/honors programme, he/she can be given remedial class. 2. Comprehensive Course Work: The comprehensive course work in the sixth semester of study shall

have a written test of 50 marks. The written examination will be of objective type similar to the GATE examination and will be conducted online by the University. Syllabus for comprehensive examination shall be prepared by the respective BoS choosing any 5 core courses studied from semester 3 to 5. The pass minimum for this course is 25. The course should be mapped with a faculty and classes shall be arranged for practising questions based on the core courses listed in the curriculum.



OF ENGINEERING MANGALAM COLLEGE Ettumanoor

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SEMESTER VII

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDI
A	CET401	DESIGN OF STEEL STRUCTURES	3-0-0	3	3
В	CETXXX	PROGRAM ELECTIVE II	3 ₁ 0-0	1, ³ ,	3
с	CETXXX	OPENELECTIVE UL KA	3-0-0	IVI	3
D	MCN401	INDUSTRIAL SAFETY ENGINEERING	2-1-0	41	
S	CEL411	ENVIRONMENTAL ENGGLAB	0-0-3	3	2
т	CEQ413	SEMINAR VLIX.011	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	1.505	24/28	15/19

PROGRAM ELECTIVE II

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
	CET413	PRESTRESSED CONCRETE	3-0-0		
	CET423	GROUND IMPROVEMENT	3-0-0		
	CET433	HIGHWAY MATERIALS AND DESIGN	3-0-0	3	3
	CET443	APPLIED HYDROLOGY	3-0-0		
D	CET453	CONSTRUCTION PLANNING & MANAGEMENT	3-0-0		
В	CET463	ADVANCED ENVIRONMENTAL ENGINEERING	3-0-0		
	CET473	OPTIMISATION TECHNIQUES IN CIVIL ENGINEERING 2014	3-0-0		

OPEN ELECTIVE

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

SLOT	COURSE NO.	COURSES	L-T-P	HOUR S	CREDIT
	CET415	ENVIRONMENTAL IMPACT ASSESSMENT	2-1-0		e cint
С	CET425 CET435 CET445 CET445	APPLIED EARTH SYSTEMS INFORMATICS FOR INFRASTRUCTURE MANAGEMENT NATURAL DISASTERS AND MITIGATION ENVIRONMENTAL HEALTH AND	2-1-0 2-1-0 12-1-0 2-1-0	AN A	∧ ₃ L
	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 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

Technical Content of the Report

Estd.

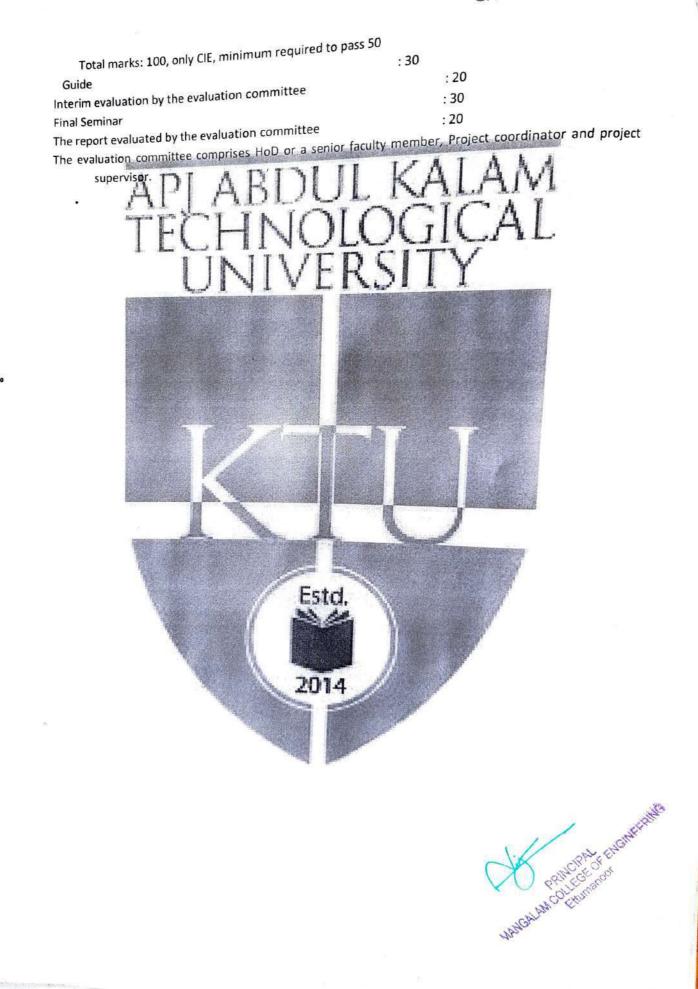
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: 40

- Presentation 1:40
 3. Project Phase I: A Project topic must be selected either from research literature or the students themselves may propose suitable topics in consultation with their guides. The object of Project Work I is to enable the student to take up investigative study in the broad field of Civil Engineering, either fully theoretical/practical or involving both theoretical and practical work to be assigned by the Department on a group of three/four students, under the guidance of a Supervisor. This is expected to provide a good initiation for the student(s) in R&D work. The assignment to normally include:
 - Survey and study of published literature on the assigned topic;
 - Preparing an Action Plan for conducting the investigation, including team work;
 - Working out a preliminary Approach to the Problem relating to the assigned topic;
 - > Block level design documentation
 - Conducting preliminary Analysis/ Modelling/ Simulation/ Experiment/ Design/ Feasibility;
 - Preparing a Written Report on the Study conducted for presentation to the Department;
 - Final Seminar, as oral Presentation before the evaluation committee.

MANGALAM COLLEGE OF ENGINEERING Ettumanoor



SEMESTER VIII

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	CET402	QUANTITY SURVEYING & VALUATION	3-0-0	3	3
В	CETXXX)		3-0-0	134	3
с	CETXXX	PROGRAM ELECTIVE IV	3-0-0-	AI	3
D	CETXXX	PROGRAM ELECTIVE	3-0-0	11	3
E	СЕТ404	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
	CET414	ADVANCED STRUCTURAL DESIGN	3-0-0		3
	CET424	GEOENVIRONMENTAL ENGINEERING	3-0-0	10000000000	
	CET434	RAILWAY AND TUNNEL ENGINEERING	3-0-0		
	CET444	IRRIGATION & DRAINAGE	3-0-0	3	
В	CET454	CONSTRUCTION METHODS &	3-0-0		
	CET464	AIRQUALITY MANAGEMENT	3-0-0	1	
	CET474	URBAN PLANNING & ARCHITECTURE	3-0-0	1	

PROGRAM ELECTIVE IV

OGRA	M ELECTIVE IV	2014	and the second second		
SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
	CET416	BRIDGE ENGINEERING	3-0-0		3
	CET426	ADVANCED FOUNDATION DESIGN	3-0-0	- 3	
	CET436	TRANSPORTATION PLANNING	3-0-0		
	CET446	INFORMATICS FOR INFRASTRUCTURE MANAGEMENT	3-0-0		
С	CET456	REPAIR AND REHABILITATION OF BUILDINGS	3-0-0		
	CET466	ENVIRONMENTAL REMOTESENSING	3-0-0	1	
	CET476	BULDING SERVICES	3-0-0		

MANGALAM COLLEGE OF ENGINEERING Ettumanoor

CLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
SLOT	COOKSE NO.		3-0-0		
	CET418	EARTHQUAKERESISTANT DESIGN	3-0-0	to an	
1	CET428	SOIL STRUCTURE INTERACTION			
	CET438)	AIBPORT, SEAPORT AND HARBOUR ENGINEERING	3-0-0	M	3
	CET448	HYDROELIMATOLOGY	3-0-0	AT	2
D	CET458	SUSTAINABLE CONSTRUCTION	1 1	3	
	CET468	CLIMATE CHANGE & SUSTAINABILITY	3-0-0	1	
	CET478	BUILDING INFORMATION MODELLING	3-0-0		

PROGRAM ELECTIVE V

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.
- 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	33
Interim evaluation, 2 times in the semester by the evaluation committee	: 50	ONL ENGINEERING
Quality of the report evaluated by the above committee	: 30	CIME .
Final evaluation by a three member committee	: 40	OPT EN
(The final evaluation committee comprises Project coordinator, expert fro	Industry/respare	Colles name

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

(ii) Registration is permitted for Minor at the beginning of third semester. Total credits required is 182

(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:

MANGALAM COLLEGE OF ENGINEERING Ehumanoor

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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 at 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.

SI. No	API AB Category IL KAL	- Çode	Credit
1	Humanities and Social Sciences including Management	нмс	5
2	Basic Science courses V C K S I Y	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:

	900.62	1.1.1.1.1.1.1	10	111、144	1	N. Br	_
1 2	3	4	5	6	7	8	Total
17 21	22	22	23	23	15	17	160
5	0 -	11.4	1		50		
	A La	antination of the	2		r		2
				NASA.			162
		1 2 3		1 2 3 4 5 17 21 22 22 23	1 2 3 4 5 6 17 21 22 22 23 23	1 2 3 4 5 6 7 17 21 22 22 23 23 15	1 2 3 4 5 6 7 8 17 21 22 22 23 23 15 17

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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MESTE	RI			HOURS	CREDI
SLOT	COURSE NO.	COURSES	L-T-P		
A		LINEAR ALGEBRA AND CALCULUS	3-1-0. 3-1-0	AA	
B 1/2	РНТ 100 СҮТ 100	ENGINEERING PHYSICS A	3-1-0 3-1-0	A	4
C 1/2	EST 100	ENGINEERING MECHANICS ENGINEERING GRAPHICS	2-1-0 2-0-2	3	3
D .	EST 110 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	0-0-2	2	1
1/2	CYL 120	ENGINEÈRING CHEMISTRY	0-0-2	2	1
т	ESL 120	CIVIL & MECHANICAL WORKSHOP E5td.	0-0-2	2	1
1/2	ESL 130	ELECTRICAL & ELECTRONICS WORKSHOP	0-0-2	2	1
		TOTAL		23/24	17

Departments

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

1100000000 Course SI Departmen SL Prefix Department Prefix NO FT Food Technology 20 Aeronautical Engg 0 1 HU Applied Electronics & Humanities 21 2 Instrumentation IE Industrial Engg Al 22 Artificial Intelligence 3 Artificial Intelligence & Data IT Information Technology 23 AD 4 Science IC Instrumentation & Control 24 AU Automobile 5 MC Mandatory Courses 25 BM **Biomedical Engg** 6 MA Mathematics 26 BT Biotechnology . 7 ME Mechanical Engg 27 CH Chemical Engg 8 MR Mechatronics 28 CY Chemistry 9 MT 29 Metallurgy CE Civil Engg 10 MU Mechanical (Auto) 30 CS. Computer Science 11 Computer Science (Artificial MP Mechanical (Prod) CA 31 12 Intelligence) Computer Science (Artificial SB Naval & Ship Building 32 CM Intelligence & Machine 13 Learning) PH Physics Computer Science (Data 33 CD 14 Science) 34 PO Polymer Engg Computer Science CC 15 Cyber Security PE Production Engg 35 Electronics & Biomedical EB 16 Robotics and Automation RA Electronics & 36 EC 17 Communication FS Safety & Fire Engg Electrical and Computer 37 EO 18 Engineering EE Electrical & Electronics 19

Table 2: Departments and their codes

)F ENGINEERING MANGALAM CO Ettumanoor

SEMESTER I

LNIESTE				HOURS	CREDIT
SLOT	COURSE NO.	COURSES	L-T-P	HUUKS	CREDIT
A ^B	MATION	LINEAR ALGEBRA AND	3-1-0	A h	
B 1/2	РНТ 100 СУТ 100	ENGINEERING PHYSICS A	3-1-0 3-1-0	A	ء 4
C 1/2	EST 100	ENGINEERING MECHANICS ENGINEERING GRAPHICS	2-1-0 2-0-2	3	3
D	EST 110 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
Е	HUN 101	LIFE SKILLS	2-0-2	4	
S	PHL 120	ENGINEERING PHYSICS	0-0-2	2	1
1/2	Atom Volameter of Atom and	ENGINEERING CHEMISTRY LAB	0-0-2	2	1
т	ESE 120	WORKSHOP ESICI.	0-0-2	2	1
1/2	ESL 130 I	ELECTRICAL -&	0-0-2	2	L I
		TOTAL	23	/24 1	7

RANGALAM COLINITY

SEMESTER II

SLOT	COURSE NO.	ARCOURSESIK	1-T-P	HOURS	CREDIT
A	MET (02	VECTOR CALCULUS , DIFFERENTIAL EQUATIONS AND TRANSFORMS	3-1-0	ÇÃ	4
В	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 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
Т	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

MANGALAM COLLEGE OF ENGINEERING

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 should attend Engineering Chemistry Lab in the same Chemistry in one sent

- 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 Electronics Engineering in a semester should attend Electrical & Electronies 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 vices 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 NANGALAM COLLEGUMANOS

ENGINEERING

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

ار Meste	A PI Fiife	HNOLO	Ğİ	ÇĂ	L
SLOT	COURSE NO.	IN ICOURSES KS	L-T-P	HOURS	CRED
A	MAT 203	DISCRETE MATHEMATICAL STRUCTURES	3-1-0	4	4
в	CST 201	DATA STRUCTURES	3-1-0	4	4
С	CST 203	LOGIC SYSTEM DESIGN	3-1-0	4	4
D	CST 205	OBJECT ORIENTED PROGRAMMING USING JAVA	3-1-0	4	4
	EST 200	DESIGN & ENGINEERING	2-0-0	2	2
E (1/2)	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
Т	CSL 203	OBJECT ORIENTED PROGRAMMING LAB (IN JAVA) 2014	0-0-3	3	2
R/M	VAC	Remedial/Minor course	3-1-0	4	4
		TOTAL		26*	22/26

MANGALAM COLLEGE OF ENGINEERING

EMESTI	ER IV		L-T-P	HOURS	CREDIT
SLOT	COURSE	COURSES			4
	MAT 206	GRAPH THEORY	3-1-0	AA	A
A	MAT 200	COMPLETR	A	AP	(1 4
В	CST 202	ORGANIZATION AND ARGHITECTURE	3-1-0 T	<u> </u>	
С	CST 204	DATABASE MANAGEMENT	3-1-0	Y. 4	4
E		OPERATING SYSTEMS	3-1-0	4	4
D	CST 206 EST 200	DESIGN & ENGINEERING	2-0-0	2	2
E (1/2)	EST 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
т	CSL204	OPERATING SYSTEMS LAB	0-0-3	3	2
R/M/ H	VAC	Remedial/Minot/Honors course	3-1-0	4	4
		TOTAL	2415 2415	26*	22/26
Exclud	ing Hours to	be engaged for Remedial/Minor/H	onors cour	se.	

NOTE:

1. Design & Engineering and Professional Ethics shall be offered in both S3 and S4. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Design & Engineering in S3 and Professional Ethics in S4 & 2014 vice versa.

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2 *All Institutions should keep 4 hours exclusively for Remedial class/Minor course (Thursdays from 3 to 5 PM and Fridays from 2 to 4 PM). If a student does not opt for minor programme, he/she can be given remedial class.

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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	AN	4
в	CST_303_	COMPUTER NETWORKS	-3-1-0	-A	4
С	CST 305	SYSTEM SOFTWARE	3-1-0	I 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
Т	-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
* Exc	luding Hours	to be engaged for Remedial/Minor	/Honors	course.	8

NOTE:

2014

1. *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.

MANGALAM COLLEGE OF ENGINEERING Ettumanoor

SEMESTER VI

ST 302 ST 304 ST 306 CST	COMPILER DESIGN COMPUTER GRAPHICS AND IMAGE PROCESSING ALGORITHM ANA LYSIS AND DESIGN PROGRAM ELECTIVE I INDUSTRIAL ECONOMICS	1 3-1- 3-1-(3-1-0 2-1-0	1ª	
CST 306	IMAGE PROCESSING ALGORITHM ANA LYSIS AND DESIGN PROGRAM ELECTIVE I	3- r-0	TY ⁴	
CST	AND DESIGN		Y	4 3
		2-1-0	3	3
UT 300	INDUSTRIAL ECONOMICS	100 Carlos - 100	States - A state -	7
01 300	& FOREIGN TRADE	3-0-0	3	3
ST 308	COMPREHENSIVE COURSE WORK	1-0-0	1	1
SL 332	NETWORKING LAB	0-0-3	3	
SD 334	MINIPROJECT	0-0-3		2
VAC	Remedial/Minor/Honors course*	3-1-0		2
House	TOTAL		and a second second	23/27
COURT TO CALL THE COURT OF THE COURT	SL 332 SD 334 /AC Hours to	ST 308 *COMPREHENSIVE COURSE SL 332 NETWORKING-LAB SD 334 MINIPROJECT /AC Remedial/Minor/Honors course* TOTAL Hours to be engaged for Remedial/Minor/Himor/Honors	ST 308 *COMPREHENSIVE COURSE WORK 1-0-0 SL 332 NETWORKING LAB 0-0-3 3D 334 MINIPROJECT 0-0-3 /AC Remedial/Minor/Honors course* 3-1-0 TOTAL Hours to be engaged for Remedial/Minor/Honors course 3-1-0	ST 308 *COMPREHENSIVE COURSE WORK 1-0-0 1 SL 332 NETWORKING-LAB 0-0-3 3 SD 334 MINIPROJECT 0-0-3 3 /AC Remedial/Minor/Honors course* 3-1-0 4

Note:

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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-II in S6, Machine Learning from Elective-III 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.

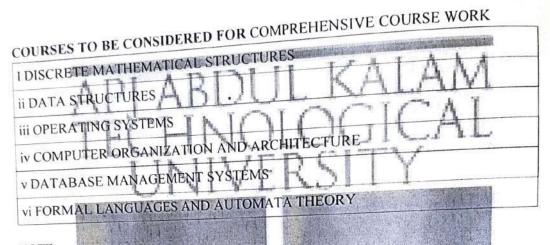
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Bucke			Semester					
t	Specialisation	So So	\$7	58				
l	A PARA Machine Learning A	FOUNDATIONS OF MACHINE LEARNING (E-I)	MACHINE LEARNING (E-11)	DEER LEARNING (F-III)				
2	Data Science	BATA INACYTICS	CEOGD J	BLOCK CHAR TECHNOLOGIES (E-V)				
3	Security in Computing	FOUNDATIONS OF SECURITY IN COMPUTING (E-I)		CRYPTOGRAPHY (E-III)				
4	Formal Methods in Software Engineering	A U TO MATED VERIFICATION (E- U	MODEL BASED SOFTWARE DEVELOPMENT (E-II)	S O F T W A R E TESTING (E-V)				

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SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
	CST 312	i FOUNDATIONS OF MACHINE LEARNING	2-1-0		
SLOT	CST 322	ii DATA ANALYTICS	2-1-0		
	CST 332	iii FOUNDATIONS OF SECURITY IN COMPUTING	2-1-0		
	CST 342	iv AUTOMATED 14	2-1-0	3	3
	CST 362	vi PROGRAMMING IN PYTHON	2-1-0		
	CST 372	vii DATA AND COMPUTER COMMUNICATION	2-1-0		

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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.
- 2. Comprehensive Course Work: The comprehensive course work in the sixth semester of study shall have a written test of 50 marks. The written examination will be of objective type similar to the GATE examination and will be conducted by the University. Syllabus for comprehensive examination shall be prepared by the respective BoS choosing the above listed 6 core courses studied from semesters 3 to 5. The pass minimum for this course is 25. The course should be mapped with a faculty and classes shall be arranged for practicing questions based on the core courses listed in the curriculum.

Estd.

3. Mini project: It is introduced in the sixth semester with a specific objective to strengthen the understanding of student's fundamentals through effective application of theoretical concepts. Mini project can help to boost their skills and widen the horizon of their thinking. The ultimate aim of an engineering student is to resolve a problem by applying theoretical knowledge Doing more projects increases problemsolving 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 the project report is required at the end of the semester.

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

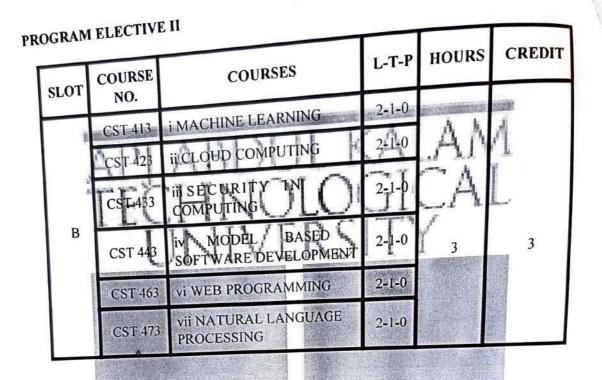
coordinator for that program and project guide. Total marks: 150 - CIE 75 marks and ESE 75 mar Split up for CIE Attendance Project Guide 10 Project Report

SEMESTER VII

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

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	CST 401	ARTIFICIAL INTELLIGENCE	2-1-0	3	3
в	CST -	PROGRAM ELECTIVE II	2-1-0		3
С	CST	OPEN ELECTIVE	2-1-0	3	3
D	MCN 401	INDUSTRIAE SAFETY ENGINEERING	2-1-0	3	1
S	CSL 411	COMPILER LAB	0-0-3	3	2
Т	CSQ 413	SEMINAR	0-0-3	3	2
U	CSD 415	PROJECT PHASE T	0-0-6	6	2
R/M/ H	VAC	Remedial/Minor/Honors course*	3-1-0	4	4
	and the second	TOTAL		24*	15/19

MANGALAN FENGINEERING



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
	CST 415	i INTRODUCTION TO MOBILE COMPUTING	2-1-0		
	CST 425	ii INTRODUCTION TO DEEP. LEARNING	2-1-0		
в	CST 435	iii COMPUTER GRAPHICS	2-1-0	3	3
	CST 445	iv PYTHON FOR	2-1-0		
	CST 455	V OBJECT ORIENTED CONCEPTS	2-1-0		H

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NOTE:

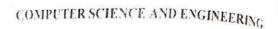
- 1. All Institutions should keep 4 hours exclusively for Remedial class/Minor/Honors course (Mondays from 10 to 12 and Wednesdays from 10 to 12 Noon). If a student does not opt for minor/honors programme, he/she can be given remedial class.
- 2. Seminar: To encourage and motivate the students to read 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[]terature 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

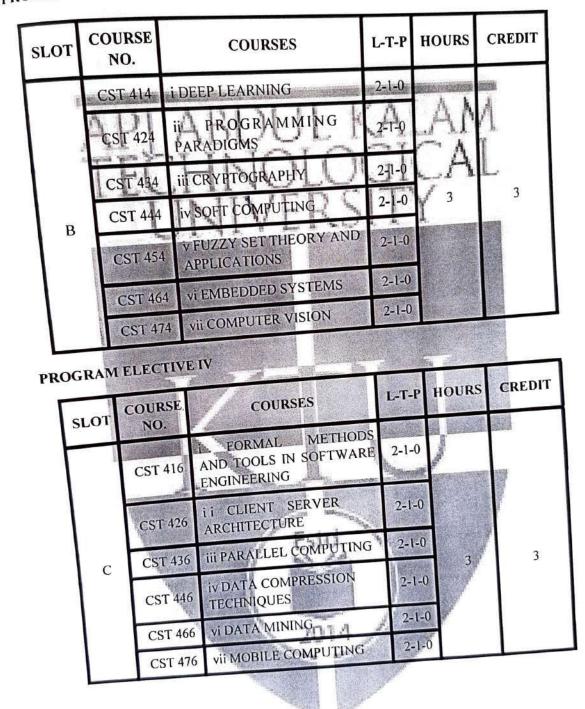


The evaluation committee comprises HoD or a senior faculty member. Project coordinator and project guide(s).

SEMESTER VIII

SLOT	COURSE NO.	COURSES	L-T-	P HOUR	s CREDI
A	CST 402	DISTRIBUTED COMPUTING	2-1-0	a a si si a	
в	CST —	PROGRAM ELECTIVE III	2-1-0		3
C	CST —	PROGRAM ELECTIVE IV	2-1-0	3	3
D	CST	PROGRAM ELECTIVE V	2-1-0	3	118 19
т	CST 404	COMPREHENSIVE FOURSE	1-0-0	3	3
U	CSD 416	PROJECT PHASE II	0-0-12	12	
VM/ H		Remedial/Minor/Honors course	3-1-0	12	4
- I. I.	the second s	TOTAL be engaged for Remedial/Minor/Ho	Jar -	25*	17/21

PROGRAM ELECTIVE III



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PROGRAM ELECTIVE V

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
D	CST 418 CST 428 CST 438	i HIGH PERFORMANCE COMPUTING n BLOCK CHAIN- TECHNOLOGIES iii IMAGE PROCESSING TECHNIQUE	2-1-0 2-1-0 2-1-0	AA CA	1 L
	CST 448	iv INTERNET OF THINGS	2-1-0		3
	CST 458	v SOFTWARE TESTING	2-1-0	1. 推制	
	CST 468	vi BIOINFORMATICS	2-1-0	產業	
	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.
- 2 Comprehensive Viva Voce: The comprehensive viva voce in the eighth semester of study shall have a viva voce for 50 marks. The viva voce shall be conducted based on the core subjects studied from third to eighth semester. The viva voce will be conducted by the same three member committee assigned for final project phase II evaluation towards the end of the semesters. The pass minimum for this course is 25. The course should be mapped with a faculty and classes shall be arranged for practicing questions based on the core courses listed in the curriculum. The mark will be treated as internal and should be upleaded along with internal marks of other courses.
- 3. Project Phase II: The objective of Project Work Phase II & Dissertation is to enable the student to extend further the investigative study taken up in Project Phase I, either fully theoretical/practical or involving both theoretical and practical work, under the mentoring of a Project Guide from the Department alone or jointly with a Supervisor drawn from R&D laboratory/Industry. This is expected to provide a good training for the student(s) in R&D work and technical leadership. The assignment shall normally include:

- In depth study of the topic assigned in the light of the Report prepared in P Phase 1:
- > Review and finalization of the Approach to the Problem relating to the assigned topic;
- Detailed Analysis/Modeling/Simulation/Design/Problem Solving/Experiment >

conclusions and future Final develop irections; ion/Publication in Journals, if Preparing a

possible; rd format for being evaluated by the Preparing a Department

Final Presentation before the concerned evaluation committee

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

Project Guide

as needed;

Interim evaluation, twice in the semester by the evaluation committee 70 10

Quality of the report evaluated by the above committee

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

Final evaluation by a three member committee

(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 piston 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 additional learning in a student to customize their Engineering degree to suit their specific objective is to permit a student to customize their Engineering degree to suit their specific objective is to permit their specific objective 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 the 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

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30

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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:

_		-			MIN	OF	R BUCKETS		-				٦
s		-	BUCKET-1			BUCKET-2	Т	BUCKET-3					
E M	S	pecia	lization - Software Engineering	Sŗ	eci	alization - Machir Learning	ne		Speci	alization - Network	cing		
E S T E R	CO UR SE NO	A T	PLA DESENANCE	HOURDIT	CO URS E NO	interest of the second	COURSE	H O U R S	CREDIT	CO URS E NO	AM course Mame	H O U R S	C R E D I T
S3	CST 281	_0	BJECT RIENTED ROGRAMMING	4 4	CS1 283		PYTHON FOR MACHINE LEARNING	CONTRACT OF	4	CST 285	DATA COMMUNICAT ION	4	4
S4	CS ⁷ 282	N	ROGRAMMING METHODOLOGIE	4	4 CS 284	100207-1-12	MATHEMATIC S FOR MACHINE LEARNING	4	Allen 4 march	CST 286	INTRODUCTIO N TO COMPUTER NETWORKS	4	4
S:	5 CS 38		CONCEPTS IN SOFTWARE ENGINEERING	4	4 CS 38	APC TO I	CONCEPTS IN MACHINE LEARNING	4	4	CST 385	CLIENT SERVER SYSTEMS	4	4
5	6	ST 82	INTRODUCTION TO SOFTWARE TESTING	4		ST 34	CONCEPTS IN DEEP LEARNING	4	A state	CST 386	WIRELESS NETWORKS AND IOT APPLICATION S	4	4
ł	S7 (CSD	Miniproject	-	1004 102250	SD 81	Miniproject		4	CSD 481	Miniproject	4	
ł	+	481 CSD	A single t		4 4	SD	1 - +	a second second	4	CSD 482	winniproject	4	4
		482	The 2 Constant	ation :	shall be	me	ntioned in the Mino	or D	egre	e to be	awarded		
	Note	-2: A	ame of the specializ any B.Tech students ckets.	from 1	non-Co	mpu	nter Science/non-IT	stre	am	s can re	gister for the courses	in	ne
							2014						

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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 Christer and the programme of
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.

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 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:

2014

MANGALAM COLLEGE OF ENGINEERING PRINCIPAL

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(vi)

NAMIGALAN COLLEGE CONSIDERATIONS

					HON	ORS BUCKETS			_			
		BUCKET-I			BUCKET-2			BUCKET-3				
S E M	Spe	cialization - Security Computing	in I		Spe T N	cialization - Mach Learning	ine		SI J	pecialization - Form Methods	al	
E S T E R	CO URS E NO	COFRENAME	HOPRS	CREDIT	CO URS NO		HOURS	CREDET		AIVI Course Aname	H O U R S	
S 4	CST 292	NUMBER THEORY	4	5	CST 294	COMPUTATIO NAL FUNDAMENT ALS FOR MACHINE LEARNING	4	4	L CST 296	PRINCIPLES OF PROGRAM ANALYSIS AND VERIFICATION	4	
S5	CST 393	CRYPTOGRAPHI C ALGORITHMS	4	4	CST 395	NEURAL NETWORKS AND DEEP LEARNING	4 H MAX	4	CST 397	PRINCIPLES OF MODEL CHECKING	4	
S6	CST 394	NETWORK SECURITY	4	4	CST 396	ADVANCED TOPICS IN MACHINE LEARNING	4	4	CST 398	THEORY OF COMPUTABILI TY AND COMPLEXITY	4	,
S7	CST 495	CYBER FORENSICS	A Statistics	4	CST 497	ADVANCED TOPICS IN ARTIFICIAL INTELLIGENC E	4	4 4 4	CST 499	LOGIC FOR COMPUTER SCIENCE	4	
S 8	CSD 496	Miniproject	4	4	CSD 496	Miniproject	4	4	CSD 496	Miniproject	4	ŀ

2014

INDUCTION PROGRAM

There will be three weeks induction program for first semester students. It is a unique threeweek 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 frogramme 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 at as concerned citizens of the world.
- Physical Activities & Sports: Engage students in sports and physical activity to ensure healthy physical and mental growth.



MANGALAM COLLEGE OF ENGINEERING Ettumanger

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

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	Total Mandatory Credits	791
6	(F)	z ds
8	Mandatory Non-credit Courses (P/F) with grade	DN
۷	Project work and Seminar	T SM
9	Open Elective Courses	E DE
S	Program Elective Courses	EC J
4	Program Core Courses	در ک
8	Engineering Science Courses	z cs:
Z	Basic Science courses	ट) इ
r	Humanities and Social Sciences Including Management	1/Jul
.15 01	Category	ab Cre

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

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

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Ledits for				z		A			291
aints Activity		05			and the second s		05		<u>د</u>
Credits	٤t	TZ	22	27	م 53	53	ST	۲۱.	09T
emester-wise cre	τ	2	ε	-12	s	9	L	8	letoT

PROMPTLE ENGINEERING

Basic Science Courses: Maths, Physics, Chemistry, Biology for Engineers, Life Science etc Engineering science courses: Basic Electrical, Engineering Graphics, Programming, Workshop, Engineering science courses: Basic Electrical, Engineering Mechanics, Mechanical Engineering, Thermodynamics, Basic Electronics, Basic Civil, Engineering Mechanics, Mechanical Engineering, Thermodynamics,

Design Engineering, Materials Engineering etc. Humanities and Social Sciences including Management courses: English, Humanities, Professional Finance & Accounting, Life skills, Professional Communication, Economics

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

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

	Description
Code	
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 evolution 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.

ENGINEERING

MANGALAM COLLEGE OF ENGINEERING Ettumanoor

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 AT	Course Prefix	SL.	Department	Course Prefix
1	Aeronautical Engg	Ao -	- 20	Food Technology	FT
2	Applied Electronics & Instrumentation	IXEL	21	Humanities I	HU
3	Artificial Intelligence	Al	22	Industrial Engg	IE
4	Artificial Intelligence & Data Science	AD	23	Information Technology	ГТ
5	Automobile	AU	24	Instrumentation & Control	IC
6	Biomedical Engg	ВМ	25	Mandatory Courses	MC
7	Biotechnology	BT	26	Mathematics	MA
8	Chemical Engg	СН	27	Mechanical Engg	ME
9	Chemistry	СҮ	28	Mechatronics	MR
10	Civil Engg	CE	29	Metallurgy	MT
11	Computer Science	CS	30	Mechanical (Auto)	MU
12	Computer Science (Artificial Intelligence)	CAES	tđ!	Mechanical (Prod)	MP
13	Computer Science (Artificial Intelligence & Machine Learning)	СМ	32	Naval & Ship Building	SB
14	Computer Science (Data Science)	CD	33	Physics	PH
15	Computer Science Cyber Security	ec 2t	34	Polymer Engg	РО
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			

MESTE	RI		L-T-P	HOURS	CREDIT
SLOT	COURSE NO.	COURSES	3-1-0	4	4
Α	MAT 101	LINEAR ALGEBRA AND CALCULUS	3-1-0	4141	4
B 1/2	рант роб	ENGINEERING PHYSICS A	3-1-0	A4	4
	CYT LOO	ENGINEERING MECHANICS	2-1-0"	3	3
C 1/2	EST 100	ENGINEERING GRAPHICS	2-0-2	4	3
	EST 110	BASICS OF CIVIL & MECHANICAL	4-0-0	4	4
D 1/2	EST 120	ENGINEERING BASICS OF ELECTRICAL &	4-0-0	4	4
-	EST 130	ELECTRONICS ENGINEERING	2-0-2	4	
E S	PHL 120	ENGINEERING PHYSICS LAB	0-0-2	2	1
1/2	CYL 120	ENGINEERING CHEMISTRY LAB	0-0-2	2	1
т	ESL 120	CIVIL & MECHANICAL WORKSHOP	-0-0-2	2	1
1/2	ESL 130	ELECTRICAL & ELECTRONICS	0-0-2	2	1
	And And And	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 2014

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SEMESTER II

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CRED
A	MAT 102	VECTOR CALCULUS, DIFFERENTIAL	3-1-0	4	4
	ADI	EQUATIONS AND TRANSFORMS	ATA	h A	L
. В 1/2	лент роо	ENGINEERING PHYSICS A	3-1-0-	141	4
1/2	CYT 100	ENGINEERING CHEMISTRY	3-1-0	A1	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
0	ESL 130	ELECTRICAL & ELECTRONICS WORKSHOP	0-0-2	2	1
I,	V.	TOTAL S		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 SI 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 SI 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

CERINIC MANGALAM COLLE ENGINEERING Ettumanoor

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

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

5. PROFESSIONAL COMMUNICATION

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



Semester III

LOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	MAT201	PARTIAL DIFFERENTIAL EQUATION AND COMPLEX	3-1-0	4	4
В	101 Tect 201	ANALYSIS SOLID STATE DEVICES	3-1-0	A4L	AA
C	ECT 203		3-1-0]4	A
D	ECT 205	NETWORK THEORY	8-1-0	14Y	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
		ΤΟΤΑ	L I	26/30	22/26

NOTE:

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

MANGALAM COLLEGE OF ENGINEERING Ettumancor

Semester IV

COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
MAT 204	PROBABILITY, RANDOM PROCESS	3-1-0	4	4
and the second	AND NUMERICAL METHODS	Sitter and the	All and the second	Web studies and a series
A 202	ANALOG CIRCUITS	3-1-0	A 4	4
-EGT 204	SIGNALS AND SYSTEMS	3-1-0		5 4 7
ECT 206	COMPUTER ARCHITECTURE AND	3-1-0	<u>] [</u>	4
ECTO CO	MICROCONTROLLERS	C I	TNY	
ES1200	DESIGN AND ENGINEERING	2-0-0	1 2	
			A LAR	2
HUT200	PROFESSIONAL ETHICS	2-0-0	2	2
MCN202	CONSTITUTION			
The second second	CONSTITUTION OF INDIA	2-0-0	2	100 M
ECL 202	ANALOG			
	SIMULATION IN ATION	0-0-3	3	
ECI 204	MICROSO		1119 C	2
	WICROCONTROLLER LAB	0-0-3	2	A date
VAC			3	2
-	Remedial/Minor/Honours course	3-1-0	4**	4
			ALC: NO	George State
The ofference of the	IOTAL		26/30	22/26
	NO. MAT 204 ECT 2D2) ECT 204	NO.MAT 204PROBABILITY, RANDOM PROCESS AND NUMERICAL METHODSECT 202ANALOG CIRCUITSECT 204SIGNALS AND SYSTEMSECT 206COMPUTER ARCHITECTURE AND MICROCONTROLLERSEST200DESIGN AND ENGINEERINGHUT200PROFESSIONAL ETHICSMCN202CONSTITUTION OF INDIAECL 202ANALOG CIRCUITS AND SIMULATION LABECL 204MICROCONTROLLER LABVACRemedial/Minor/Honours Course	NO.LeftMAT 204PROBABILITY, RANDOM PROCESS AND NUMERICAL METHODS3-1-0ECT 2D2ANALOG CIRCUITS3-1-0ECT 2D4SIGNALS AND SYSTEMS SIGNALS AND SYSTEMS3-1-0ECT 206COMPUTER ARCHITECTURE AND MICRDCONTROLLERS3-1-0EST200DESIGN AND ENGINEERING 	NO.L-F-FHOOKSMAT 204PROBABILITY, RANDOM PROCESS AND NUMERICAL METHODS3-1-04ECT 2D2ANALOG CIRCUITS3-1-04ECT 2D4SIGNALS AND SYSTEMS MICROCONTROLERS3-1-04ECT 206COMPUTER ARCHITECTURE AND MICROCONTROLERS3-1-04EST200DESIGN AND ENGINEERING MICROCONTROLERS2-0-02HUT200PROFESSIONAL ETHICS SIMULATION OF INDIA SIMULATION LAB2-0-02ECL 202ANALOG CIRCUITS AND SIMULATION LAB0-0-33ECL 204MICROCONTROLER LAB MICROCONTROLER LAB0-0-33VACRemedial/Minor/Honours Course3-1-04**

NOTE:

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

Semester V

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
A	ECT 301	LINEAR INTEGRATED CIRCUITS	3-1-0	4	4
В	ECT 303	DIGITAL SIGNAL PROCESSING	3-1-0/	Λ I^4 A	M
С	EGT 305) ^{3-1-0,}	IC	AL
D	ECT 307	CONTROL SYSTEMS/ E.R.	53-1-0	Y	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
т	ECL 333	DIGITAL SIGNAL PROCESSING LAB	0-0-3	3	2
R/M/H	VAC	Remedial/Minor/Honours	3-1-0	4**	4
	ALTER PERCONTRACTOR	TOTAL	The second	27/31	23/27

NOTE:

- 1. Industrial Economics & Foreign Trade and Management for Engineers shall be offered in both S5 and S6. Institutions can actise 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 anti Weddesdays from 3 to 5 PM). If a student does not opt for minor/honours programme, he/she can be given remedial class.

PRINCIPAL MANGALAM COLLEGE OF ENGINEERING Ettumanoor

Semester VI

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
Α	ECT 302	ELECTROMAGNETICS	3-1-0	4	4
В	ECT 304	VLSI CIRCUIT DESIGN	13-1-0/		M
С	=EGT 306	INFORMATION THEORY AND CODING	3-1-0-	1 A	Δ1
D	ECTXXX		2-1-0	13	d 11.31
E ½	HUT300	-INDUSTRIAL ECONOMICS AND- FOREIGN TRADE	3-0-0	3.	3
/2	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
/м/н	VAC	Remedial/Minor/Honours	3-1-0	4**	4
	- Shitting	course	ST REALE	25/20	22/27

- *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)

MANGALAM COLLEGE OF ENGINEERING Ettumanoor

Semester VII

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
Α	ECT 401	MICROWAVES AND ANTENNA	5 2-1-0	3	3
В	ECTXXX		2-1-0	A31.	AN
С	ECTXXX		2-1-0	716	7Å]
D	MCN401	INDUSTRIAL SAFETY ENGINEERING	2-1-0	130	
S	ECL 411	ELECTROMAGNETICS LAB	10-0-3	LJI	2
T	ECQ 413	SEMINAR	0-0-3	3	2
U	ECD 415	PROJECT PHASE I	0-0-6	6	2
к/м/н	VAC	Remedial/Minor/Honors Course	3-1-0	4*	4
		TOTAL		24/28	15/19

	NO.	COURSES	L-T-P	HOURS	CREDIT
	ECT 413	Optical Fiber Communication	Concernant Providence	10000000000000 00 0	CREDIT
	ECT 423	Computer Networks	2-1-0		
	ECT 433	Opto-electronic Devices	2-1-0		
В	ECT 443	Instrumentation ESTO	2-1-0	3	3
	ECT 453	Error Control Codes	2-1-0	1	3
	ECT 463 🕷	Machine Learning	2-1-0	The second	
	ECT 473	DSP Architectures	2-1-0		
			2-1-0		

OPEN ELECTIVE (OE)

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The open elective is offered in semester 7. Each program should specify the courses (maximum 5) they The open elective is offered in semester 7. Each programs 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

WANGALAW COLLEGE ENGINEERING

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
	ECT 415	Mechatronics	2-1-0		
	ECT 425	Biomedical Instrumentation	2-1-0	Section 2	
	ECT 435	Electronic Hardware for Engineers	2-1-0	A ³ I A	3
С	ECT 445	IoT and Applications	2-1-0	AN	
	ECT 455	Entertainment Electronics	2-1-0	٦Â آ	

NOTE:

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

Total marks: 100, only CIE, minimum required to pass 50 10

Attendance

: 20 Guide Technical Content of the Report

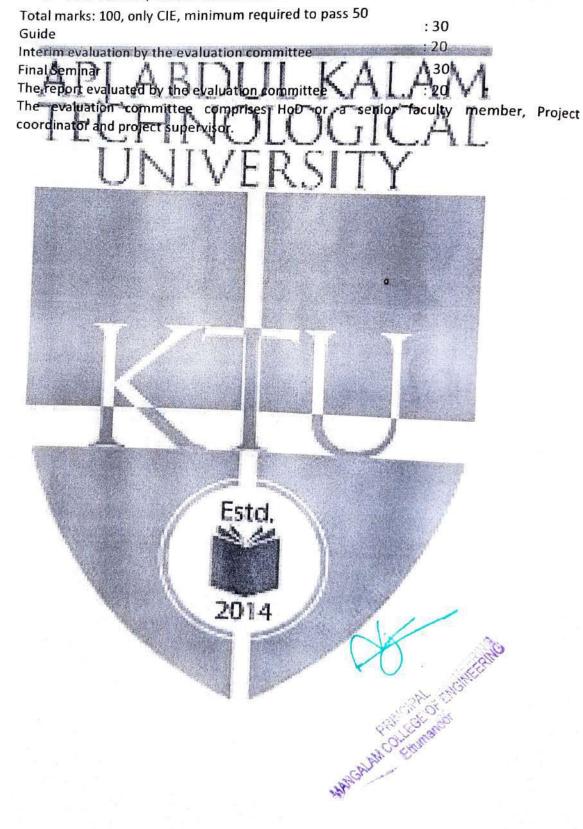
- : 40 Presentation 3. Project Phase I: A Project topic mustified selected either from research literature or the
- students themselves may propose suitable topics in consultation with their guides. The object of Project Work I is to enable the student to take up investigative study in the either fully Communication Engineering, field of Electronics and broad 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:

30

- 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;

FENGINEERING MANGALAM COL

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



Semester VIII

SLOT	NO.	COURSES	L-T-P	HOURS	CREDIT
E	CT 402	WIRELESS COMMUNICATION	2-1-0	3	3
BE	AXP	PROGRAM ELECTIVE WIT	2-1-0	AI	A٨
C	ECTXXX	PROGRAM ELECTIVE IV	(2-1-0	3.10	°Д
D	ECTXXX	PROGRAM ELECTIVE	2-1-0	TV	34 1
E	ECT 404	COMPREHENSIVE VIVA VOCE	1-0-0	14	1
U	ECD 416	PROJECT PHASE II	0-0- 12	12	4
R/M/H	VAC	Remedial/Minor/Honors	3-1-0	4*	4
		TOTAL	影響の	25/28	17/21

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDIT
	ECT 414	Biomedical Engineering	2-1-0		
	ECT 424	Satellite Communication	2-1-0		
	ECT 434	Secure Communication	2-1-0		
	ECT 444	Pattern Recognition	2-1-0	3	3
В	ECT 454	RF Circuit Design	2-1-0		
	ECT 464	Mixed Signal Circuit Design	2-1-0		
	ECT 474	Entrepreneurship 51Cl.	2-1-0		

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

MANGALAM COLLEGE OF ENGINEERING

	COURSE NO.	COURSES	I-I-P	HOURS	CREDIT
ECT 418	418	Mechatronics	2-1-0		
ECT 428	428	Optimization Techniques	2-1-0		
	ECI.438 1	Computer Vision 1 1 1 1 7	₹2-1-0	-	
DECT	448	Low Power VLS	2-1-0		ω
ECT	458	Internet of Things	2-1-0-	77.4 7	
ECT	468-	Renewable Energy Systems	3-1-0		
ECT	ECT 478-	2	2.1.0		

N opt for minor/honours programme, he/she can be given remedial class. course (Mondays from 10 to 12 and Wednesdays from 10 to 12), if a student does not ACIA IOI Kemedial class/Minor/Honours

- 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 the end of the semester. core subjects studied from third to eighth semester. The viva voce will be conducted by uploaded along with internal marks of other courses core courses listed in the curriculum. mapped with a faculty and classes shall be arranged for practising questions based on the same three member committee assigned for final project phase II evaluation towards The pass minimum for this course is 25. The course should be The mark will be treated as internal and should be
- w theoretical/practical or involving both theoretical and practical work, under the guidance 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
- of a Supervisor from the Departmen work and technical leadership. Th laboratory/Industry. This is expected one or jointly with a Supervisor drawn from R&D vide a good training for the student(s) in R&D ht to normally include
- V Phasel; In depth study of the top in the light of the Report prepared under
- Review and finalization of the problem relating to the assigned
- topic; Detailed Analysis/Modelling/Simulation/Design/Problem Solving/Experiment as
- needed
- directions; Final development of product/process, testing, results, conclusions and future
- Preparing a paper for Conference presentation/Publication in Journals, if possible;
- V Preparing a Dissertation in the standard format for being evaluated by the Department;
- Y Final Presentation before a Committee

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

Interim evaluation, 2 times in the semester by the evaluation committee : 50 Quality of the report evaluated by the above committee

(The evaluation committee comprises HoD or a senior faculty member, Project

Final evaluation by a three member committee (The final evaluation committee comprises 40

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,

estd.

(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.

> MANGALAM COLLEGE OF ENGINEERING Ettumanoor

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ELECTRONICS & COMMUNICATION ENGINEERING

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

the chosen area	BEAL PROPERTY		t to cti	dy the	courses in
AND COMMUNI	CATION	canop	t to sto		
13	151	14	1-1	18	

SE		BASKETI	4			No.	BASKET II	H	c	COURS	COURSE NAME	ł	1
ME STE	COURS E NO.	COURSE NAME	H O	R	1	E NO.	ERS	0 U	RE	Ϋ́́Νο.		1	
R			U R S	高	in:			R S	D I T			R S	1
\$3	ECT281	ELECTRONIC CIRCUITS	4	4	and the state of the	ECT283	ANALOG COMMUNICATI ON	° 4	4	ECT285	INTRODUCTION TO SIGNALS AND SYSTEMS	4	4
S4	ECT282	MICROCONT ROLLERS	4	4		ECT284	DIGITAL COMMUNICATI ON	4	4	ECT286	INTRODUCTION TO DIGITAL SIGNAL PROCESSING	4	4
\$5	ECT381	EMBEDDED SYSTEM DESIGN	4	4	a second	ECT383	COMMUNICATI ON SYSTEMS	4	4	ECT385	TOPICS IN DIGITAL IMAGE PROCESSING	4	4
S6	ECT382	VLSI CIRCUITS	4	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. Honourstis 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.

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

There won't be any supplementary examination for the courses chosen for honours.

- On successful accumulation of credits at the end of the programme, "Bachelor of (iv)
- Technology in xxx, with Honours" will be awarded if overall CGPA is greater than or (v) equal to 8.5, earned a grade of 'C' or better for all courses chosen for honours and without any history of 'F' Grade.
- 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 (vi) 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:

MANGALAM COLL OF ENGINEERING Ettumanoor

		GROUP I				GROUP II			[C. D. O. L. D. W.		_	_
SE ME STE R	COURS E NO.	COURSE NAME	H O U R S	- 6	COURSE NO.	COURSE NAME	H O U R S		COURSE NO.	GROUP III COURSE NAME		H O U R	T
S4	ECT292	NANOELECTRO NICS	4	1 of 1	EC1/294	STOCHASTIC PROCESSES FOR	4	т 4	A h FCT296	e och one		S 4	1
S5	ECT393	FPGA BASED SYSTEM DESIGN	-4	4	ECT395	COMMUNICATION DETECTION AND		4		SIGNAL			
S6	ECT394	ELECTRONIC		Contraction of the local distance of the loc	11V	ESTIMATION THEORY		Y		COMPUTATI ONAL TOOLS FOR SIGNAL	4		4
		DESIGN	4	4	ECT396	MIMO AND MULTIUSER COMMUNICATION	4	4	ECT398	PROCESSING DETECTION AND	4	4	•
\$7	ECT495	RF MEMS	4	4	ECT497	SYSTEMS DESIGN AND	4	4	ECT499	ESTIMATION THEORY			
				A CONTRACTOR OF A CONTRACTOR	7.7	ANALYSIS OF ANTENNAS		「日本の一方法」を見ていた。		MULTIRATE SIGNAL PROCESSING	4	4	
S8	ECD496	MINIPROJECT	4	4	ECD496	MINIPROJECT	4	4 6	A.C.A.	AND WAVELETS			
	INDU	CTION PROGRAM	ALL A	AT NO	Star Sector		4		CD496	MINIPROJECT	4	4	

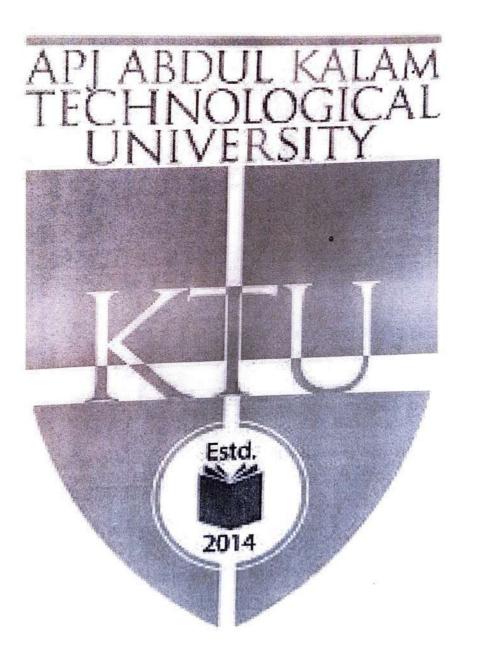
There will be three weeks induction program for first semester students. It is a unique threeweek immersion Foundation Programme designed especially for the fresher's which includes a wide range of activities right from workshops, lectures and seminars to sports tournaments, social work and much more. 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
- · Creativity: Provide channels to exhibit and develop individual creativity by expressing themselves through art, craft, music, singing, media, dramatics, and other creative
- 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 C etconeenn place in at as concerned citizens of the world.

WANGUAN COLLEGE

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





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.

SI.	Category	Code	Credits
No	tot is the ball of Management	AMO.	8
1	Humanities and Social Sciences including Management courses	HIV	
2	Basic Science courses	BSO	26
3	Engineering Science Courses	ESC .	-22
4	Program Core Courses IV E COLLI	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	1	62
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:

		The Spins when the part of a		ALL DESCRIPTION OF A DATE	CONTRACT!	A1 2500		MANAGEMENT ST.	-
Sem	1	2	3	4	5	6	7	8	Total
Credits	17	21	22	20	14 ²³	23	15	17	160
Activity Points		50	2	Y			50		
Credits fo Activity	r			2		and			2
G.Total			administer en	in the second second	ALC: NOT				162

MANGALAM COLLEGE OF ENGINEERING Ettumanoor

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, Accounting, Professional Ethics, Management, Finance &

Mandatory non-credit courses Systainable 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.

Code	Description Description
т	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. 1.52 8, 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: 1	Departmen	ts and t	heir codes	
SL NO	API AB Department	Course Prefix	SL. NO	KALAM	Course Prefix
	Aeronautical Engg	AO	20	Food Technology	FT
1	Applied Electronics &	MA	18 18 I	Humanities I	HU
2	Instrumentation	AE L	HERBITARIA		IE
3	Artificial Intelligence	Al	22	Industrial Engg	
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	вт	26	Mathematics	MA
8	Chemical Engg	CH	27	Mechanical Engg	ME
9	Chemistry	СҮ	28	Mechatronics	MR
10	Civil Engg	CE	29	Metallurgy	МТ
10	Computer Science	CS	30	Mechanical (Auto)	м
12	Computer Science (Artificial Intelligence)	CAE	stal.	Mechanical (Prod)	M
13	Computer Science (Artificial Intelligence & Machine Learning)	СМ	32	Naval & Ship Building	SE
14	Computer Science (Data Science)	CD	33	Physics	Pł
15	Computer Science Cyber Security	CC ²	34	Polymer Engg	P
16	Electronics & Biomedical	EB	35	Production Engg	
17	Electronics & Communication	EC	36		
18	Electrical and Computer Engineering	EO	37	Safety & Fire Engg	F
19		EE			

MANGALAM COLLEGE OF ENGINEERING Ettumanoor

WANGNAM COLLEGE OF ENGINEERING

SEMESTER I

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CRED
A	MAT 101	LINEAR ALGEBRA AND CALCULUS	3-1-0	4	4
В	BHT 100 T		M 3-1-0	A & A	4
1/2	CYT 100	ENGINEERING CHEMISTRY	3-1-0		4
C 1/2	EST 100	ENGINEERING MECHANICS	2-1-0	.AL	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

2014

SEMESTER II

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDI
A	MAT 102	VECTOR CALCULUS, DIFFERENTIAL	3-1-0	4	4
В	PHT 100 T	EQUATIONS AND TRANSFORMS ENGINEERING PHYSICS A	3-1-0	h ⁴ j	4
в 1/2	CYT 100	ENGINEERING CHEMISTRY	3-1-0		4
С	EST 100	ENGINEERING MECHANICS	2-1-0	A3L	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 1/2	ESL 120	CIVIL & MECHANICAL WORKSHOP	0-0-2	2	1
	ESL 130	ELECTRICAL & ELECTRONICS WORKSHOP	0-0-2	2	1
		TOTAL Estd.		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 SI 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

PRINCIPA MANGALAM COLLEGE OF EN NEERING Etiumanoor

in the Institution to opt for Engineering Mechanics in SI and Engineering Graphics in 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 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.

Estd.

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 selfexpression, 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
В	EET201	CIRCUITS AND NETWORKS KA	2-2-0	M	4
с	EET203_		3-1-0	AL	4
D	EET205	ANALOGELIEGTRONICS R STT	3-1-0	4	4
E 1/2	EST200	DESIGN & ENGINEERING	2-0-0	2	2
1/2	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
т	EEL203	ANALOG ELECTRONICS LAB	0-0-3	3	2
R/M	VAC	REMEDIAL/MINOR COURSE	3-1-0	4 *	4
		TOTAL)	26/30	22/26

NOTE:

- 1. Design & Engineering and Professional Ethics shall be offered in both S3 and S4. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Design & Engineering in S3 and Professional Ethics in S4 & vice versa.
- *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

LOT	COURSE NO	COURSES	L-T-P	HOURS	CREDI
A	MAT 204	PROBABILITY, RANDOM PROCESSES AND NUMERICAL METHODS	3-1-0	4	4
В	EET202	DC MACHINES AND TRANSFORMERS	12-2-9	N ⁴ A	4
с	EET204	ELECTROMAGNETIC THEORY	3-1-0		4
D	EET206	DIGITAL ELECTRONICS	3-1-0	44	4
E	EST200	DESIGN & ENGINEERING	1-0-0	2	2
1/2	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
Т	EEL204	DIGITAL ELECTRONICS LAB	0-0-3	3	2
R/M/H	VAC	REMEDIAL/MINOR/HONOURS	3-1-0	4*	4
		TOTAL		26/30	22/26

NOTE:

- 1. Design & Engineering and Professional Ethics shall be offered in both S3 and S4. Institutions can advise students be orging 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.

WANGALAM COLLEGE OF ENGINEERING

SEM	ESTER	v
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IESTER	COURSE NO	COURSES	L-T-P	HOURS	CREDIT
SLOT	COOKSENO		3-1-0	4	4
A	EET301	POWER SYSTEMS I	una protocologica de la constancia de la co		4
в	EET303 T	MICROPROCESSORS AND	3-1-9	NA.	4
в	APL	MICROCONTROLLERS	3-1-0	141	4
С	EET305	SIGNALS AND STATEMON	11	AL	4
D	EET30Z	SYNCHRONOUS AND INDUCTION	1 3-1-0/	14	
		MACHINES INDUSTRIALECONOMICS & FOREIGN	3-0-0	3	3
E 1/2	нитзоо	TRADE	3-0-0	3	3
1/2	HUT310	MANAGEMENT FOR ENGINEERS	3-0-0		
	NICN201	DISASTER MANAGEMENT	2-0-0	2	-
F	MCN301		0-0-3	3	2
S	EEL331	MICROPROCESSORS AND MICROCONTROLLERS LAB	005		
т	EEL333	ELECTRICAL MACHINES LAB II	0-0-3	3	2
/ I .2		ATTACK AND A DESCRIPTION OF A DESCRIPTIO	3-1-0) 4*	4
R/M/H	VAC	REMEDIAL/MINOR/HONOURS		A REALIZED	
		TOTAL		27/31	23/2

NOTE:

- Industrial Economics & Foreign Trade and Management for Engineers shall be offered in both 55 and 56. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Industrial Economics & Foreign Trade in 55 and Management for Engineers in 56 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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MESTER	VI	COURSES	L-T-P	HOURS	CRED
SLOT	COURSE NO		2-2-0	4	4
A	EET302	LINEAR CONTROL SYSTEMS		. 4	4
В	EET304	POWER SYSTEMS II II KA	3-1-9	M	4
С	EET306	POWEREEECTRONICS	3-1-0	4]	3
D	EETXXX	PROGRAM ELECTIVEL	2-1-0/		
E	НИТ300	INDUSTRIALIECONOMICS & FOREIGN	3-0-0	3	3
1/2	HUT310	MANAGEMENT FOR ENGINEERS	3-0-0	3	3
F	EET308	COMREHENSIVE 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

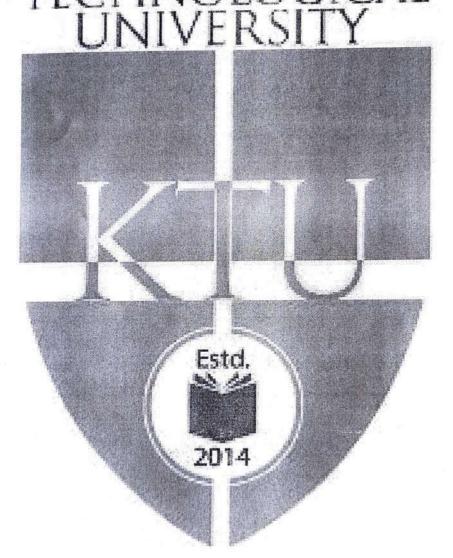
SLOT	COURSE NO	Estd.	L-T-P	HOURS	CREDIT
	EET312	BIOMEDICAL INSTRUMENTATION	2-1-0		
	EET322	RENEWABLE ENERGY SYSTEMS	2-1-0		
D	EET332	COMPUTER ORGANIZATION	2-1-0	3	3
EE	EET342	HIGH VOLTAGE ENGINEERING	2-1-0		
	EET352	OBJECT ORIENTED PROGRAMMING	2-1-0		
	EET362	MATERIAL SCIENCE	2-1-0		
	EET372	SOFT COMPUTING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

NOTE:

 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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- *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 B 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.



MANGALAM COLLEGE OF ENGINEERING Ettumanoor

MESTER	VII		L-T-P	HOURS	CREDI
SLOT	COURSE NO	COURSES			
SLUT	COUNDENIE	CONTROL SYSTEMS	2-1-0	3	3
Α	EET401	ADVANCED CONTROL SYSTEMS	and the second second	Sharee and state	3
В	EETXXX		2-1-0	NA	
Ъ	APL	ARIUNA	2-1-0		3
С	EETXXX	OPEN ELECTIVE	6	A.3.	
D	MCN401	INDUSTRIAL SAEETY ENGINEERING	2-1-0	II. Ohens'	
		CONTROL SYSTEMS LAB	0-0-3	3	2
S	EEL411	Control signation		3	2
T	EEQ413	SEMINAR	0-0-3	3	-
U	EED415	PROJECT PHASE I	0-0-6	6	2
J			3-1-0	4*	4
R/M/H	VAC	REMEDIAL/MINOR/HONOURS			
		TOTAL		24/28	15/19

PROGRAM ELECTIVE II

SLOT	COURSE NO	COURSES	L-T-P	HOURS	CREDIT
			2-1-0	CARGE STREET,	
	EET413	ELECTRIC DRIVES	- THEAT	_	
	EET423	DIGITAL CONTROL SYSTEMS	-2-1-0	A STREET	2
В	EET433	MODERN OPERATING SYSTEMS	2-1-0	3	5
	EET443	DATA STRUCTURES	2-1-0		
	EET453	DIGITAL SIGNAL PROCESSING	2-1-0		
	EET463	ILLUMINATION TECHNOLOGY	2-1-0		
	EET473	DIGITAL PROTECTION OF POWER	2-1-0		

OPEN ELECTIVES

2014

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.

WANGALAM COLLEGE CO

ELECTRICAL & ELECTRONICS ENGINEERING OUDS CREDIT

		00110055	L-T-P	HOURS	CREDIT
SLOT	COURSE NO.	COURSES			
520.		THE FUCINEERING	2-1-0		
	EET415	CONTROL SYSTEMS ENGINEERING	2-1-0		
C EET42	EET425	INTRODUCTION TO POWER PROCESSING	2-1-0	3	3
	EET435	RENEWABLE ENERGY SYSTEMS	12-1-0	h A	
	EEJ445	ELECTRIC VEHICLES	2-1-0	IM	
	FET455	ENERGYMANAGEMENT	a state of a	4 1	

NOTE: Minor/Honours course (Mondays from 10 to 12 and Wednesdays from 10 to 12 Noon). If a student 1. *All Institution does not opt for minor/honours programme, he/she can be given remedial class.

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

: 10

20

30

: 40

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

Attendance

Guide Technical Content of the Report

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

Survey and study of published literature on the assigned topic;

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

MANGALAM CULLEGE OF ENGINEERING Ettumanuor

- 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 Interim evaluation by the evaluation committee Final Seminar The report evaluated by the evaluation committee The evaluation committee comprises HoD or a senior faculty member, Project coordinator and project supervisor. Estd. 2014 JF ENGINEERING NANGALAM COLLEGE OF C

SEMESTER VIII

SLOT	COURSE NO	COURSES	L-T-P	HOURS	CREDIT
A	EET402	ELECTRICAL SYSTEM DESIGN AND ESTIMATION	2-1-0	3	3
В	Δ ^{xx} D1	A RELECTIVE III KA	2-1-0	NA	3
С	EETXXX	PROGRAM ELECTIVE IV	2-1-0	AT	3
D	EETXXX	PROGRAM ELECTIVE	2-1-0	1.3	3
т	ЕЕТ404	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	3-1-0	4*	4
		TOTAL		25/29	17/21

PROGRAM ELECTIVE III

COURSE NO	COURSES	L-T-P	HOURS	CREDIT
EET414	ROBOTICS	2-1-0		
EET424	ENERGY MANAGEMENT	2-1-0	NAME AND ADDRESS OF ADDRESS	
EET434	SMART GRID TECHNOLOGIES	2-1-0	3	3
EET444	ELECTRICAL MACHINE DESIGN	2-1-0		
EET454	SWITCHED MODE POWER CONVERTERS	2-1-0		
ЕЕТ464	COMPUTER AIDED POWER SYSTEM	2-1-0		
EET474	MACHINE LEARNING	2-1-0	P.	
	EET414 EET424 EET434 EET434 EET444 EET454 EET464	EET414 ROBOTICS EET424 ENERGY MANAGEMENT EET434 SMART GRID TECHNOLOGIES EET444 ELECTRICAL MACHINE DESIGN EET454 SWITCHED MODE POWER CONVERTERS EET464 COMPUTER AIDED POWER SYSTEM ANALYSIS	EET414ROBOTICS2-1-0EET424ENERGY MANAGEMENT2-1-0EET434SMART GRID TECHNOLOGIES2-1-0EET444ELECTRICAL MACHINE DESIGN2-1-0EET454SWITCHED MODE POWER CONVERTERS2-1-0EET464COMPUTER AIDED POWER SYSTEM2-1-0ANALYSIS2-4-0	EET414ROBOTICS2-1-0EET424ENERGY MANAGEMENT2-1-0EET434SMART GRID TECHNOLOGIES2-1-0EET444ELECTRICAL MACHINE DESIGN2-1-0EET454SWITCHED MODE POWER CONVERTERS2-1-0EET464COMPUTER AIDED POWER SYSTEM2-1-0ANALYSIS2-1-0

SLOT	COURSE NO	C2YB9F2	L-T-P	HOURS	CREDIT
	EET416	NONLINEAR SYSTEMS	2-1-0		
	EET426	SPECIAL ELECTRIC MACHINES	2-1-0		
С	EET436	POWER QUALITY	2-1-0	3	3
	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		

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RINGIERIL MANGALAM COLLEGE OF ENGINEERING Ettumanoor

PROGRAM ELECTIVE V

SLOT	COURSE NO	COURSES	L-T-P	HOURS	CREDIT
	EET418	ELECTRIC AND HYBRID VEHICLES	2-1-0		
	EET418	INTERNET OF THINGS	2-1-0		3
D	EET438	ENERGY STORAGE SYSTEMS	2-1-0 2-1-0	M	
	EET458	SOLAR PV SYSTEMS	2 <u>-1</u> -0 2-1-0	AI	
	EET468		Kind	-L	
	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.
- 2. Comprehensive Course Viva: The comprehensive course viva in the eighth semester of study shall have a viva voce for 50 marks. The viva voce shall be conducted based on the core subjects studied from third to eighth semester. The viva voce will be conducted by the same three member committee assigned for final project phase II evaluation towards the end of the semester. The pass minimum for this course is 25. The course should be mapped with a faculty and classes shall be arranged for practising questions based on the core courses listed in the curriculum. The mark will be treated as internal and should be uploaded along with internal marks of other courses.
- 3. Project Phase II: The object of Project Work II & Dissertation is to enable the student to extend further the investigative study taken up in Project 1, either fully theoretical/practical or involving both theoretical and practical work, under the guidance of a Supervisor from the Department alone or jointly with a Supervisor drawn from R&D laboratory/Industry. This is expected to provide a good training for the student(s) in R&D work and technical leadership. The assignment to normally include:
 - In depth study of the topic assigned in the light of the Report prepared under 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;

ENGINEERING

- > 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 Guide Las 50 Interim evaluation, 2 times in the semester by the evaluation comm : 30 Quality of the report evaluated by the above committee (The evaluation committee comprises HoD or a senior faculty member, Project coordinator and project supervisor). 40 Final evaluation by a three-member committee (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.

E510

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 accurrentiates 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.

GE OF ENGINEERING MANGALAM COL Ettumancor

(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 3baskets. 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	Dx -	BASKET			-	BASKET II	13-1			BASKET III		
e st er	Course No.	Course Name	H O U R S	E	Course No.	Course Name Estd.	H C U R S	RED	Course No.	Course Name		2 0
S3	EET281	ELECTRIC CIRCUITS	4	4	EET 283	INTRODUCTION TO POWER ENGINEERING	4	4	EET 285	DYNAMIC CIRCUITS AND SYSTEMS	4	
S 4	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
56	EET 382	POWER SEMICONDUCTOR DRIVES	4	4	EET 384	INSTRUMENTATION AND AUTOMATION OF POWER PLANTS	4	4	EET 386	DIGITAL CONT	4	4
S7	EED 481	MINIPROJECT	4	4	EED 481	MINIPROJECT	4	4	EED 481	MINIPROJECT	4	4
6									MANGP	PRINCIPAL PRINCIPAL LAM COLLEGE	- We	INT

										1	
58	EED 482	MINIPROJECT	4	4	EED 482	MINIPROJECT	4	4	EED 482	MINIPROJECT	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 **Fact**

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).

- 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 (iii) 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. examination for the courses chosen for There-won't be any supplementary (iv)
- 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 (v)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.
- The registration for honours program will commence from semester 4 and the all (vi) 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:

			1990	No.	The second second	AND	VID WICH	18.80	shipter Victorian and	PREPARE CARACTER CONSTR		
		GROUPI				GROUP II	100		A Series	GROUP III	_	
S e m es te r	Course No	Course Name	H O U R S	RE	Course No	Course Name E5td,	H O U R S	R E D	Course No	Course Name	H U R S) F
54	EET292	NETWORK ANALYSIS AND SYNTHESIS	4	4	EET 292	NETWORK ANALYSIS AND SYNTHESIS	4	4	EET 292	NETWORK ANALYSIS AND SYNTHESIS	4	4
S 5	EET393	DIGITAL SIMULATION	4	4	EET 393	DIGITAL	4	4	EET 393	DIGITAL SIMULATION	4	4
56	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

MANGALAM COLLEGE OF ENGINE

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 at 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 Code Credits

below.	Category	Code	Credit
SI.	and the second	НМС	- 8
No	including Management		
12	Humanities and Social Sciences including Management courses	-BSCA	V 1 1 26
	Basic Science courses	ESC	22
	Engineering Science Courses	PCC	76
4	Program Core Courses VIVLING	DEC	15
5	Program Elective Courses	PEC	
		OEC	3
6	Open Elective Courses	PWS	10
7 1	Project work and Seminar	FWS	
8 1	Mandatory Non-credit Courses (P/F) with grade	MNC	
		MSA	2
9 1	Mandatory Student Activities (P/F)		
	Total Mandatory Credits	1	62
	(Ontional)	VAC	20
10	Value Added Course (Optional)	a series de la companya	1

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
	17	21	22	22	14 23	23	15	17	160
Credits							50		
Activity Points		50	1			and the second s	50		
Credits for Activity				2					2
G.Total		k-							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.

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.

Code	Table 1: Code for the courses Description
т	Theory based courses (other the lecture hours, these courses can have tutoria 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.)
Ν	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.

PRINCIPAL MANGALAM COLLEGE OF ENGINEERING

Departments

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

	Table 2: 1	Departments	and th	icii coucs	
L 0	API AB Department LIN	AND ALL ALL AND AL	SL.	KALAM Department	Course Prefix
ı	Aeronautical Engg	AO	20	Food Technology	FT
2	Applied Electronics &	NE L	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	мс
7	Biotechnology	BT	26	Mathematics	MA
8	Chemical Engg	СН	27	Mechanical Engg	ME
9	Chemistry	СҮ	28	Mechatronics	MR
10	Civil Engg	CE	29	Metallurgy	MT
11	Computer Science	CS	-30	Mechanical (Auto)	MU
12	Computer Science (Artificial Intelligence)	CAE	stal.	Mechanical (Prod)	MP
13	Computer Science (Artificial	СМ	32	Naval & Ship Building	SB
14	Computer Science (Data	CD-		Physics	PH
15	Computer Science	CC4		Polymer Engg	PC
1	6 Electronics & Biomedical	EB	35	Production Engg	PE
1	7 Electronics & Communication	EC.	36	Robotics and Automation	R.A
	18 Electrical and Computer Engineering	EO	37	Safety & Fire Engg	FS
	19 Electrical & Electronics	EE			

MANGALAM COLLEGE OF ENGINEERING Ettumancor

SEMESTER I

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDI
A	MAT 101	LINEAR ALGEBRA AND CALCULUS	3-1-0	4	4
	AD	I ADDILL	r AT	AA	4
B 1/2	PHT 110	ENGINEERING PHYSICS B	3-40	5414	4
1/2	CYT 100		3-10	A	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
-1-	ESL 130	ELECTRICAL & ELECTRONICS	0-0-2-		ave.
	Part data	WORKSHOP		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

WANGALAM COLLEGE OF ENERNIE

SEMESTER II

	K II	20110555	L-T-P	HOURS	CREDIT
LOT	COURSE NO.	COURSES			4
		VECTOR CALCULUS, DIFFERENTIAL	3-1-0	4	· 4
A	MAT 102	EQUATIONS AND TRANSFORMS	310	AN	4
В	PHT 110	ENGINEERING	L A passa Ta T	7 1 7	
1/2	CYT 100-1	ENGINEERING CHEMISTRY	J ³¹⁰	A	4
C	EST 100	ENGINEERING MECHANICS	2-1-0	3	3
1/2		UNIVERSI	2-0-2	4	3
	EST 110	ENGINEERING GRAPHICS	The second		
D	EST 120	BASICS OF CIVIL & MECHANICAL	4-0-0	4	4
1/2	EST 130	ENGINEERING BASICS OF ELECTRICAL &	4-0-0	4	4
		ELECTRONICS ENGINEERING	2-0-2	4	N
E	HUN 102	PROFESSIONAL COMMUNICATION	2-0-2		
F	EST 102	PROGRAMMING IN C	2-1-2	5	4
S	PHL 120	ENGINEERING PHYSICS LAB	0-0-2	2	1
1/2		ENGINEERING CHEMISTRY LAB	0-0-2	2	1
	CYL 120	ENGINEERING CHEWISTAT DAG		1	9 ²
т	ESL 120	CIVIL & MECHANICAL WORKSHOP	0-0-2	2	1
1/2	ESL 130	ELECTRICAL & ELECTRONICS	0-0-2	2	1
		TOTAL		28/2	9 23

NOTE:

- 1. Engineering Physics B and Engineering Chemistry shall be offered in both semesters. Institutions can advise students belonging to about 50% of the number of branches in the Institution to opt for Engineering Physics B in SI 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 SI and Engineering Graphics in S2 & vice versa.

MANGALAM COLLEGE OF ENGINEERING

SEMESTER IV

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CRED
A MAT202		Department of the second s		4	4
В	A P MET202	NUMERICAL METHODS	A 3-1-0-	AM	4
C	MET204	MANUFACTURING PROCESS	31-0	AL	4
D	MET206	ELUID MACHINERY ERST	3-1-0	4	4
E	EST200	DESIGN AND ENGINEERING	2-0-0	2	2
1/2	HUT200	PROFESSIONAL ETHICS	2-0-0	2	2
F	MCN202	CONSTITUTION OF INDIA	2-0-0	2	8.
S	MEL202	FM & HM LAB	0-0-3	3	2
т	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 Tithics 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.

ENGINEERING WANGALAM COLLECTOR

SEMESTER V

SLOT	COURSE NO.	COURSES	L-T-P	HOURS	CRED T
A	MET301	MECHANICS OF MACHINERY	A 3-1-0 A	h 4	4
В	MET303	THERMAL ENGINEERING	3-1-0	IV4L	4
с	MET305	INDUSTRIAL & SYSTEMS ENGINEERING	TV	14.	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
т	MEL333	THERMAL ENGINEERING LAB-I	0-0-3	3	2
/м/н	VAC	REMEDIAL/MINOR/HONORS COURSE	3-1-0	4*	4
l	and the second se	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

	COURSE NO.	COURSES	L-T-P	HOURS	CREDI
LOT	COOKSE NO.		3-1-0	4	4
A	MET302	HEAT & MASS TRANSFER	3-1-0		
В	MET304)	DYNAMICS AND DESIGN OF	A3-1-0	AN	4
с	MET306.	ADVANCED MANUFACTURING	3-1-0	AL	4
D	METXXX	PROGRAMELECTIVE D	2-1-0	3	3
E	HUT300	INDUSTRIAL ECONOMICS AND FOREIGN TRADE	3-0-0	3	3
Y ₂	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
т	MEL334	THERMAL ENGINEERING LAB-II	0-0-3	3	2
R/M/ H	VAC	REMEDIAL/MINOR/HONOURS	3-1-0	4*	4
		TOTAL	T.	25/29	23/27

PROGRAM ELECTIVE I

SLOT	COURSE NO.	COURSESTO,	120		
		COURSESTOF	L-T-P	HOURS	CREDIT
	MET312	NONDESTRUCTIVE TESTING		A CARLER AND A	20
	MET322	COMPUTATIONAL FLUID DYNAMICS	2-1-0	SUSF .	
	MET332	ADVANCED MECHANICS OF SOLIDS	2-1-0		
D	MET342	IC ENGINE COMBUSTION AND T POLLUTION	2-1-0 2-1-0		1.1
	MET352	AUTOMOBILE ENGINEERING		3	3
NOTE:	MET362	PRODUCT DESIGN AND DEVELOPMENT	2-1-0		
	MET372	ADVANCED METAL JOINING TECHNIQUES	2-1-0 2-1-0	li Ki	

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. MANGALAM COLLEGE OF ENGINFERING

- **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.



MANGALAM COLLEGE OF ENGINEERING

SEMESTER VII

ENTLUT		COURSES	L-T-P	HOURS	CREDIT
SLOT	COURSE NO.	COURSES	4		2
A	MET401	DESIGN OF MACHINE ELEMENTS	2-1-0	3	3
_	METXXX	PROGRAM ELECTIVE II	2-1-0	3	3
В	AD	ARTIKA	2-1-0	Mat	3
с	MÊTXXX-	OPÉN ÉLÉCTIVE	IC.	ΔŤ_	
D	MCN401		2.1-0.	TL B.	
S	MEL411	MECHANICAL ENGINEERING LAB	0-0-3	3	2
т	MEQ413	SEMINAR	0-0-3	3	2
U	MED415	PROJECT PHASE I	0-0-6	6	2
R/M/ Н	VAC	REMEDIAL/MINOR/HONORS COURSE	3-1-0	4*	4
		TOTAL	i i i	24/28	15/19
PROGF SLOT	RAM ELECTIVE II COURSE NO.	COURSES			elle.
			L-T-P H	OURS CF	REDIT
	MET413	ADVANCED METHODS IN NONDESTRUCTIVE TESTING	2-1-0		
В	MET423	OPTIMIZATION TECHNIQUES AND APPLICATIONS	2-1-0	3	
	MET433	EINUTE FLERAFAT			3

OPEN ELECTIVE

MET433

MET443

MET453

MET463

MET473

FINITE ELEMENT METHOD

AEROSPACE ENGINEERING

AIR CONDITIONING AND

REFRIGERATION

HYBRID AND ELECTRIC VEHICLES

OPERATIONS MANAGEMENT

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.

2-1-0

2-1-0

2-1-0

2-1-0

2-1-0

GEOF ENCINEERING MANGALAM COLL Ethumancor

C -	4 7-2	ANALYTICS
	MET425	QUANTITATIVE TECHNIQUES FOR 21-0 3
	MET435	AUTOMOTIVE TECHNOLOGY
	MET445	RENEWABLE ENERGY ENGINEERING
	MET455	QUALITY ENGINEERING AND 2-1-0 MANAGEMENT 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 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

Technical Content of the Report Presentation

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:

Estr

> Survey and study of published literature on the assigned topic;

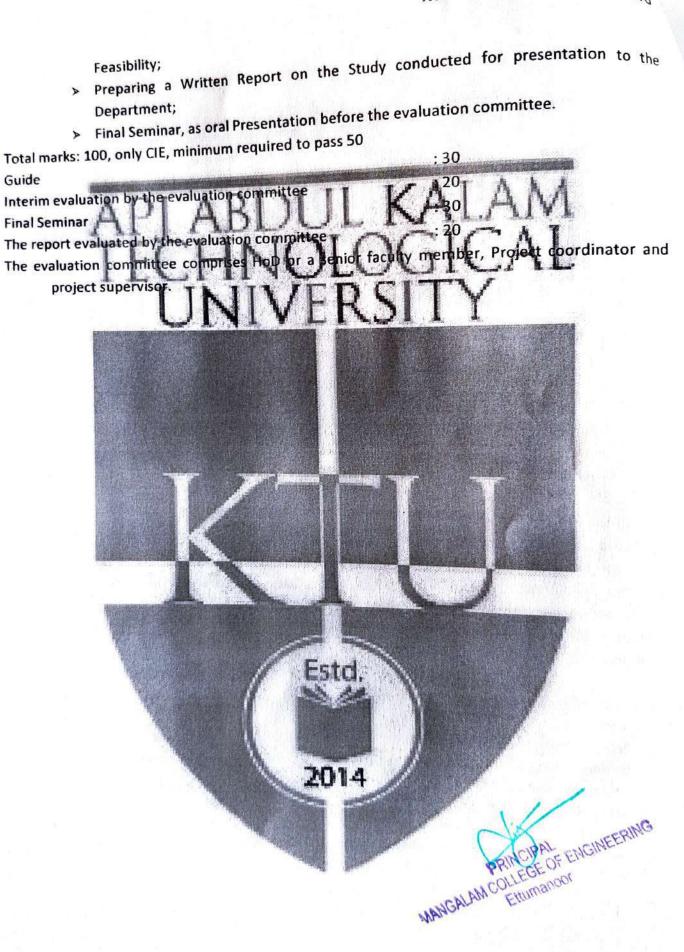
20

30

40

- 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/

MANGALANI CON NCIPAL



SEMESTER VIII

LOT	COURSE NO.	COURSES	L-T-P	HOURS	CREDI
A	MET402	MECHATRONICS	2-1-0	3	3
В	(KXX		2-1-0	AN	3
С	METXXX	PROGRAM ELECTIVE IV	211-0	141	3
D	METXXX	PROGRAMELECTIVE	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 ø	REMEDIAL/MINOR/HONORS COURSE	3-1-0	4*	4
		TOTAL	A State Street	25/28	17/21

SLOT	COURSE NO. COURSES			HOURS	CREDIT
	MET414	QUALITY MANAGEMENT	2-1-0		<u>8</u>
	MET424	DECISIONS WITH METAHEURISTICS	2-1-0		
	MET434	PRESSURE VESSEL AND PIPING DESIGN	2-1-0		
В	MET444	DATA ANALYTICS FOR ENGINEERS	2-1-0	3	3
	MET454	INDUSTRIAL TRIBOLOGY	2-1-0		
В	MET464	MICRO AND NANO MANUFACTURING	2-1-0		
	MET474	HEATING AND VENTILATION SYSTEMS	2-1-0		
PROGR	MET474	HEATING AND VENTILATION SYSTEMS	2-1-0		

PROGRAM ELECTIVE IV

SLOT	COURSE NO.	COURSES]] 4	L-T-P	HOURS	CREDIT
	MET 416	COMPOSITE MATERIALS	2-1-0		
	MET 426	ARTIFICIAL INTELLIGENCE AND MACHINE			
	MET 436	ACOUSTICS AND NOISE CONTROL	2-1-0	3	3
с	MET 446	HEAT TRANSFER EQUIPMENT DESIGN	2-1-0	1	
C	MET 456	ROBOTICS AND AUTOMATION	2-1-0	1	
	MET 466	TECHNOLOGY MANAGEMENT	2-1-0		
	MET 476	CRYOGENIC ENGINEERING	2-1-0		

MANGALAM COLLEG PAL OF ENGINEERING

PROGRAM ELECTIVE V CREDIT HOURS COURSES COURSE NO SLOT MET 418 RELIABILITY ENGINEERIN **MET 428** INDUSTRIAL INTERNE **MET438** 2-1-0 FRACTURE MECHANICS D 3 3 **MET 448** GASTURBINES AND JE 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

- *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
 - Preparing a paper for Conference presentation/Publication in Journals, if possible;

MANGALAM COLLEGE OF ENGINEERING

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

Fotal marks: 150, only CIE, minimum required to pass 75	
Guide : 30	
Interim evaluation, 2 times in the semester by the evaluation committee : 50	
Interim evaluation, 2 times in the semester by the evaluation comments	
Quality of the report evaluated by the above committee	
Final evaluation by a three member committee	/research
Devices coordinator experimentation	Londuct
(The final evaluation committee comprises, project continuous) of the institute and a senior faculty from a sister department. The same committee will	Conduct
comprehensive course viva for 50 marks)-	
INIVERNIX	
MINOR UINIVLIGAS	

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 and the consolidated in the consolidated

(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.

MANGALAM COLLEGE OF ENGINEERIN

(iv) There won't be any supplementary examination for the courses chosen for Minor. (v) There won't be any supplementary each of Technology in xxx with Minor in yyy" will be (v) On completion of the program, "Bachelor of Technology in xxx with Minor in yyy" will be

(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 cour listed below:

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s		BASKET I	L.,	1		BASKET II		1		BASKET III		_
e			H	C			H	C			H	
m	Course	Course Name	0	R	Course	Course Name	0	0.000	Course	Course Name	0	R
e	No.		U	E	No.		U	E	No.		U	E
st			R	D	The second second		R	D		ALL	R	D
er	1		S	1			S	1			S	1
				T				T	ALC: NO			Т
\$3	MET281	MECHANICS OF MATERIALS	4	4	MET283	FLUID MECHANICS & MACHINERY	4	4	MET285	MATERIAL SCIENCE &	4	4
S 4	MET282	THEORY OF MACHINES	4	4	MET284	THERMODYNAMICS	4	4	MET286	TECHNOLOGY MANUFACTURIN	4	4
S5	MET381	DYNAMICS OF MACHINES	4	4	MET383	THERMAL SCIENCE AN ENGINEERING	94	4	MET385	G TECHNOLOGY MACHINE TOOLS	4	4
S6	MET382	MACHINE DESIGN	4	4	MET384	HEAT TRANSFER	4	4	MET386	ENGINEERING		
57	MED481	MINIPROJECT	4	4	MED481	MINIPROJECT	h.			INDUSTRIAL ENGINEERING	4	4
					101	MILLI KOJECT.	4	4	MED481	MINIPROJECT	4	4
58	MED482	MINIPROJECT	4	4	MED482	MINIPROJECT	4	4	MED482	MINIPROJECT		

7 7"

TTT

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 209 4 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

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

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

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

SE ME		GROUPI				GROUP II			3/	GROUP III		
STE R	Course	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	RE
S4	MET292	CONTINUUM MECHANICS	4	4	MET294	ADVANCED MECHANICS OF FLUIDS	4	4	MET296	MATERIALS IN MANUFACTURING	4	4
S5	MET393	EXPERIMENT AL STRESS	4	4	MET395	ADVANCED THERMODYNA	4	4	MET397	FLUID POWER	4	4

MANGALAN COLLEGE OF ENGINEER/NG

	1	ANALYSIS	T	Τ	Ι	MICS				AUTOMATION		
56	MET394	ADVANCED DESIGN SYNTHESIS	4	4	MET396	COMPRESSIBL E FLUID FLOW	4	4	MET398	ADVANCED NUMERICAL CONTROLLED MACHINING	4	4
57	MET495	ADVANCED THEORY OF VIBRATIONS	4	4	BD	COMPUTATIO NAL METHODS IN FLUID FLOW & HEAT	10	4	MET499	PRECISION MACHINING	4	4
58	MED496	MINIPROJEC	4	4	MED496	TRANSFER MINIPROJECT	4	14	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 sensiors 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 at as concerned citizens of the world.



HOWERBING MANGALAMCOLLE

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

MANGALAM COLLE



APJ Abdul Kalam Technological University

Cluster 4: Kottayam

M. Tech Program Electronics and Communication Engineering

with specialization in Communication Engineering

B. Tech / B.E in Electronics and Communication engineering, or allied

branches with strong focus in electronics 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.F. in Electronics and Communication and

SEMESTER-1

Exam Slot	Course Code	Name	L-T-P	Internal Marks	End Sem. Exam		Credits
				IVIARKS	Marks	hrs	(22)
A	04 EC 6301	Analytical Foundation for Communication Engineering	4-0-0	40	60	3	4
в	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- <mark>0-</mark> 2	100	0	0	1
		TOTAL	22				21

2 APJ Abdul Kalam Technological University Cluster 4 M. Tech in Communications Engineering

SEMESTER-2

Exam Slot	Course No:	Name	L- T - P	Internal Marks	End Sem. Exam		Credits (19)
				Marks	Marks	hrs	(19)
A	04 EC 6302	Advanced Communication Networks	4-0-0	40	60	3	4
в	04 EC 6304	Multicarrier and MIMO Communication Systems	3-0-0	40	60	3	3
с	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
Slot					Marks	hrs	(0)
	04 EC 7390	Industrial Training	0-0-4				Pass/ Fail

SEMESTER-3

Exam	Course No:	Name	L- T - P	Internal	End Sem. Exam		Credits
Slot			141	Marks	Marks	hrs	(14)
Α	04 EC 73XX	Elective 4	3-0-0	40	60	3	3
в	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

3 APJ Abdul Kalam Technological University Cluster 4 M. Tech in Communications Engineering



SEMESTER-4

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

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ELECTIVE GROUP	EXAM SLOT	Course No:	Name				
	E	04 EC 6309	Advanced Optical Communication				
1	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				
	D	04 EC 6308	Advanced Wireless & Mobile Communication system				
2	D	04 EC 6312	Modern Satellite Systems				
2	D	04 EC 6314	RF Microelectronics				
	D	04 EC 6316	Multimedia compression techniques				
	E	04 EC 6318	Electromagnetic Compatibility and Interference				
3	E	04 EC 6322	Estimation and Detection				
5	E	04 EC 6324	Neural Networks and applications				
	E	04 EC 6326	Computational Electromagnetic				
	Α	04 EC 7301	Wireless ADHOC and Sensor Networks				
4	Α	04 EC 7303	Communication Switching & Multiplexing				
4	Α	04 EC 7305	Cloud Computing				
	Α	04 EC 7307	Microwave Integrated Circuits Design				
-	В	04 EC 7309	Adaptive and smart antennas				
5	В	04 EC 7311	Communication Network Security				
3	В	04 EC 7313	Computer Vision				
Γ	В	04 EC 7315	Modern trends in communications				

ELECTIVE LIST

4 APJ Abdul Kalam Technological University | Cluster 4 | M.Tech in Communications Engineering 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

ENGINEERING



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:	Course No: Name		Internal Marks	End S E	Credits	
					Marks	Dura tion (hrs)	
Α	04 CS 6101	Computational Intelligence	3-1-0	40	60	3	4
В	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		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

LEGE UP ENGINEERING

2 APJ Abdul Kalam Technological University/Cluster 4/M.Tech in Computer Science & Engg.



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
				ind its	Marks	Dura tion (hrs)	
		Advanced Database	3-0-0	40	60.	3	3
Α	04 CS 6102	Management		10	60	3	3
в		Automata Theory and	3-0-0	40	00		
	04 CS 6104	Computability	3-0-0	40	60	3	3
С		High Performance Computer Architecture	3-0-0				3
	04 CS 6106		3-0-0	40	60	3	
D	04 CS 6XXX*	Elective 2	3-0-0	40	60	3	3
E	04 CS 6XXX^	Elective 3	0-0-4	100	0	0	2
-	04 CS 6192	Mini Project	a sectore sectore sec	100	0	0	1
	04 CS 6194	Advanced Computing Lab	0-0-2	100	-		18
	04 (30134	Total	21		List of Elec		forslot

*See List of Electives -II for slot D

List of Elective - II Courses

Course	Course Name
Code	Deta Mining
04 CS 6108	Information Retrieval and Data Mining
	Web Security
	Course Code 04 CS 6108 04 CS 6112 04 CS 6114 04 CS 6116

List of Elective - III Courses

Exam	Course	Course Name
Slot	Code	
5	04 CS 6118	Bioinformatics
E		Digital Image Processing
E	04 CS 6122	a hor Decign Concepts
F	04 CS 6124	Operating system besign and
-	04 CS 6126	
E	04 05 0120	

ummer Bre	eak ourse No:	Name	L- T - P	Internal Marks	End Ser Exa		Credits
Exam Co Slot	urse No.			Marks	Marks	Dura tion (hrs)	
			0-0-4	NA	NA	NA	Pass /Fail
NA 04	CS 7190	Industrial Training					0
		Total	4				
	3 APJ Aba Engg.	lul Kalam Technological University	Cluster 4	M.Tech in	MANGA	er Scien	cea



M. Tech Program in Computer Science and Engineering

Semester 3 (Credits: 14)

Exam Slot	Course No:	Name	L- T - P	Internal Marks	End Ser Exa		Credits
					Marks	Dura tion (hrs)	
А	04 CS 7XXX*	Elective - IV	3-0-0	40	60	3	3
В	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	
Α	04 CS 7101	Cyber Forensics	
Α	04 CS 7103	Distributed Computing Systems	
Α	04 CS 7105	Wireless Sensor Networks	
А	04 CS 7107	Text Mining and Language Processing	

List of Elective - V Courses

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

Semester 4 (Credits: 12)

		Marks		22	
hase -II)	0-0-21	70	30	NA	12
Total	21				12
	hase -II) Total		hase -II) 0-0-21 70	Ma hase -II) 0-0-21 70 30	hase -II) 0-0-21 70 30 NA

Total: 67

4 APJ Abdul Kalam Technological University / Cluster 4 / M. Tech in Computer Science & MOINEEPING Engg. MANGALAM COLLEGE OFFICIAL 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





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 creditsAllotment of credits and examination scheme:-

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

Exam Slot	COURSE No.:	Name	L- T - P	Internal Marks	End Se Exar		Credits
					Marks	Hrs	(22)
A	04 ME 6101	Business Mathematics	3-1-0	40	60	3	4
В	04 ME 6103	Business Practice and Industrial Economics	3-1-0	40	60	3	4
с	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
Ε	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

SEMESTER-1

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

1 APJ Abdul Kalam Technological University|Cluster 04|M. Tech Program in Industrial Engineering & Management

SEMESTER-2

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Exam Slot	Course No:	Name	L- T - P	Internal Marks	End Se Exa	212/21/202 0	Credits
				Warks	Marks	hrs	(18)
A	04 ME 6102	Quantitative Techniques	3-0-0	40	60	3	3
В	04 ME 6104	Quality Management	3-0-0	40	60	3	3
с	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

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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
					Marks	hrs	(0)
NA	04 ME 7190	Industrial Training	0-0-4				Pass/ Fail

2 APJ Abdul Kalam Technological University|Cluster 04|M. Tech Program in Industrial Engineering & Management

SEMESTER-3

Exam	Course No:	Name	L-T-P	Internal	End Sem. Exam		Credits (14)
Slot	course wo.	, torrice		Marks	Marks	hrs	(14)
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
Α	04 ME 7107	Industrial Ergonomics

List of Elective-V Courses:

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

SEMESTER-4

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

Total: 66 Credits

3 APJ Abdul Kalam Technological University | Cluster 04 | M. Tech Program in Industrial Engineering & Management



9

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

PRINCIPAL MANGALAM COLLEGE OF ENGINEERING

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 creditsAllotment of credits and examination scheme:-

Semester 1 (Credits: 22)

Exam Slot	Course No:	ourse No: Name	L- T - P	Internal Marks	End Semester Exam		Credits (22)
	•				Marks	Dura tion (hrs)	alvest dzak
Α	04 EE 6001	Optimization Techniques for Engineering Applications	3-0-0	40	60	3	3
В	04 EE 6301	Power Electronic Devices & Circuits	4-0-0	40	60	3	4
с	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
Ε	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

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List of Elective - I Courses

Exam Slot	Course No.	Course Name	
E	04 EE 6103	System Theory	
Ε	04 EE 6200	Electric Drive Systems	_
E	04 EE 6205	Modelling and Analysis of Electrical Machines	
E	04 EE 6300	Advanced Power Semiconductor Devices	1 1

M. Tech (Power Electronics and Power Systems)

2 APJ Abdul Kalam Technological University/Cluster 04/M. Tech Program in Power Electronics and Power Systems

Semester 2 (Credits: 19)

Exam Slot	Course No:	Name	L- T - P	Internal Marks	End Semester Exam		Credits
					Marks	Dura tion (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
С	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
<u> </u>	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
	04 22 0390	Total	22		ist of Electiv		19

*See List of Electives -II for slot D

^See List of Electives -III for slot E

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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
F	04 EE 6118	Advanced Digital Signal Processing
10	04 EE 6212	Applications of Special Electrical Machines
F	04 EE 6308	Analysis, Design and Grid Integration of Photovoltaic Systems
F	04 EE 6444	FACTS and Power Quality

3 APJ Abdul Kalam Technological University | Cluster 04 | M. Tech Program in Power Electronics and Power Systems PRINCIPAL MANGALAM COLLEGE OF ENGINEERING



M. Tech (Power Electronics and Power Systems)

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Exam Slot	Course No:	e No: Name	L-T-P	internal Marks	End Semester Exam		Credits
					Marks	Dura tion (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:	o: Name	L-T-P	internal Marks	End Semester Exam		Credits
					Marits	Dura tion (hrs)	
A	04 EE 7XXX*	Elective - N	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

ASee 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
В	04 EE 7113	Industrial Control Electronics
В	04 EE 7307	Numerical Simulation of Power Electronic Systems
В	04 EE 7421	Electricity Deregulation
B	04 EE 7603	Advanced Controllers for Embedded Systems

4 APJ Abdul Kalam Technological University/Cluster 04/M. Tech Program in Power Electronics and Power Systems

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M. Tech (Power Electronics and Power Systems)

Semester 4 (Credits: 12)

Exam Slot	Course No:	Name	L-T-P	Internal Marks	Exte Evalu Ma	ation	Credits
NA	04 EE 7494	Project (Phase -II)	0-0-21	70	30	NA	12
				10			12
		Total	21				Total: 6

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5 APJ Abdul Kalam Technological University | Cluster 04 | M. Tech Program in Power Electronics and Power Systems

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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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 creditsAllotment of credits and examination scheme:-

Semester 1 (Credits: 22)

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Exam Slot	Course No:	Name	L-T-P	Internal Marks	End Se Exa		Credits
A	04 CE 6401				Marks	Dura tion (hrs)	1
		Analytical methods in Engineering	3-1-0	40	60	3	4
В	04 CE 6403	Theory of Elasticity	240				
С	04 CE 6405	Construction Management	3-1-0	40	60	3	4
D	04 CE 6407	Advanced D	3-0-0	40	60	3	3
-		Advanced Design of Concrete Structures	3-0-0	40	60	3	3
E	04 CE 6XXX*	Elective - I					
	04 GN 6001	Research Methodology	3-0-0	40	60	3	3
	04 CE 6491	Seminar - I	0-2-0	100	0	0	2
	04 CE 6493		0-0-2	100	0	0	
	04 CE 0493	Computer Application Lab	0-0-2	100	0		2
		Total	23		0	0	1
							22

*See List of Electives-I for slot E

List of Elective - I Courses

xam Course Slot	o. Course Name
E 04 CE 6	9 Construction and Contracts Management
E 04 CE 6	1 Structural Dynamics
E 04 CE 6	3 Construction Planning, Scheduling and Control
E 04 CE 6	5 Prestressed Concrete Structures

2 APJ Abdul Kalam Technological University | Cluster 4 | M. Tech in Structural Engineering & Construction Management

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Semester 2 (Credits: 18)

Exam Slot	Course No:	Name	L-T-P	Internal Marks	End Ser Exa	11000000000	Credits
					Marks	Dura tion (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
Ε	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 Ser Exa		Credits
					Marks	Dura tion (hrs)	
NA	04 EC 7590	Industrial Training	0-0-4	NA	NA	NA	Pass /Fail
		Total	4				0

3 APJ Abdul Kalam Technological University/Cluster 4/M. Tech in VLSI & Embedded Systems

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Semester 3 (Credits: 14)

Exam Slot	Course No:	Name	L- T - P	Internal Marks	End Ser Exa		Credits
					Marks	Dura tion (hrs)	
Α	04 EC 75XX	Elective - 4	3-0-0	40	60	3	3
в	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
Α	04 EC 7501	Mixed VLSI Circuits Design
Α	04 EC 7503	System On Chip
Α	04 EC 7505	Computer Architecture And Parallel Processing
Α	04 EC 7507	Electronic System Design

List of Elective - V Courses

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

Semester 4 (Credits: 12)

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

Total: 65

5 APJ Abdul Kalam Technological University/Cluster 4/M. Tech in VLSI & Embedded Systems

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:	se No: Name	L- T - P	Internal Marks	End Semester Exam		Credits
					Marks		
A	04EC6501	VLSI Technology	4-0-0	40	60	- Annester -	4
В	04EC6503	Advanced Digital Design	3-0-0	40	60	3	3
С	04EC6505	CMOS VLSI Design	3-0-0	40	60	3	3
D	04EC6507	Design with ARM Microcontrollers	3-0-0	40	60		3
Ε	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

2 APJ Abdul Kalam Technological University/Cluster 4/M. Tech in VLSI & Embedded Systems

PRINCIPAL INGALAN COLL E OF ENGINEERING



Semester 2 (Credits: 19)

Exam Slot	Course No:	Name	L- T - P	Internal Marks	End Semester Exam		Credits
					Marks	Dura tion (hrs)	
A	04 CE 6402	Project Planning and Implementation	3-1-0	40	60	3	4
B	04 CE 6404	Finite Element Analysis	3-0-0	40	60	3	3
С	04 CE 6406	Theory of Plates & Shells	3-0-0	40	60	3	3
D	04 CE 6XXX*	Elective - II	3-0-0	40	60	3	3
E	04 CE 6XXX^	Elective - III	3-0-0	40	60	3	3
	04 CE 6492	Mini Project	0-0-4	100	0	0	2
	04 CE 6494	Structural Engineering 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 CE 6408	Advanced Analysis of Structures
D	04 CE 6412	Design of Reinforced Concrete Foundations
D	04 CE 6414	Earthquake Analysis and Design of Structures
D	04 CE 6416	Construction methods and Equipments

List of Elective - Ill Courses

Exam Slot	Course Code	Course Name
E	04 CE 6418	Advanced Concrete Technology
E	04 CE 6422	Advanced Steel Structures
E	04 CE 6424	Quantitative methods in Construction
E	04 CE 6426	Project Formulation and Appraisal

Summer Break

Exam	Course No:	Name		Internal Marks	End Semester Exam	Credits	
5101					Marks	Exam arks Dura tion (hrs)	
NA	04 CE 7490	Industrial Training	0-0-4	NA	NA	NA	Pass /Fail
		Total	4				0

Semester 3 (Credits: 14)

3 APJ Abdul Kalam Technological University Cluster 4 M. Tech in Structural Engineering & Construction Management

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Exam Slot	Course No:	Name	L- T - P	Internal Marks	End Semester Exam		Credits
					Marks	Dura tion (hrs)	
Α	04 CE 7XXX*	Elective - IV	3-0-0	40	60	3	3
В	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
Α	04 CE 7401	Design of Steel – Concrete Composite Structures
А	04 CE 7403	Design of Bridges
A	04 CE 7405	Construction Economics and Finance
Α	04 CE 7407	Design of Tall Buildings

List of Elective - V Courses

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

Semester 4 (Credits: 12)

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

Total: 67

4 APJ Abdul Kalam Technological University | Cluster 4 | M. Tech in Structural Engineering & Construction Management

PRINCIPAL MANGALAM COLLEGE OF ENGINEERING

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	(hours) 3 3 3	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
	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	00	3	3
	18	Project	0-0-9	20			
		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			5
	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

MANGALAM COLLEGE OF ENGINEERING Ettumaneor

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	2	3
	45	Elective III	3-0-0	40	60	2	
	46	Elective IV	3-0-0	40	60	3	3
		TOTAL	18-0-0	240	360	3	3

TRIMESTED IV

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	1000
	57	Project	0-0-4	100	00	3	3
		TOTAL	18-0-4	340	360		4 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	2	3
	64	Comprehensive Project	0-0-6	100	100	3	3
	65	Internship	0-0-3		100		6
_				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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SI.No.	Code	HR Electives	Trimester
1	HR-T4-1	Training and Development	
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	T4
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	T5
14	HR-T6-14	HR Analytics	T6
15	HR-T6-15	HR Consulting: Profession and Practice	T6 T6

SI. 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	Тб
14	FIN-T6-14	Financial Derivatives	T6
15	FIN-T6-15	Insurance Management	T6

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

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2	MKT-T4-2	Consumer Behaviour	l-r
3	MKT-T4-3		14
4	MKT-T4-4	Social Marketing	T4
5	MKT-T4-5	Services Marketing	T4
6	MKT-T4-5	Marketing Research	T4
7	the second se	Sales and Distribution Management	T4
8	MKT-T5-7	International Marketing	T5
-	MKT-T5-8	Brand Management	
9	MKT-T5-9	Retail Management	Т5
10	MKT-T5-10	Integrated Marketing Communications	T5
11	MKT-T5-11	Customer Relationship Management	T5
12	MKT-T5-12	Digital and Social Madia	T5
13	MKT-T6-13	Digital and Social Media Marketing Customer Analytics	T5
14	MKT-T6-14		T6
15	MKT-T6-15		те
-	10-10-15	Strategic Marketing	TG

SI. No.	Code	Operations Election	
1	OM-T4-1	Operations Electives Supply Chain and Logistics Management	Trimeste
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	T4
8	OM-T5-8		T5
9	OM-T5-9	Services Operations Management	T5
10	OM-T5-10	Technology Management	T5
11	OM-T5-11	Innovation Management and New Product Development	T5
12	OM-T5-12	Green Logistics and Supply Chain Management	T5
13	OM-T6-14	Six Sigma and TQM	T5
14	OM-T6-14	Advanced Project Management	T6
15		Advanced Maintenance Management	T6
10	OM-T6-16	Business Sustainability	T6

SI. No.	Code	Systems Electives	T .1
1	SYS-T4-1	System Analysis and Design	Trimester T4
2	SYS-T4-2		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		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	тө
15	SYS-T6-15	Information Security and Risk Management	T6

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CURRICULUM FOR MBA, 2020

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Exam Slot	Course No.	Course Name	L-T-P	Internal Marks	End Semester Marks	Exam Duration (hours)	Credits
A	20MBA101	Introduction to Business ABDUL	3-0-0	/40/M	60	3	3
В	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	I 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
н	20MBA115	Legal Systems for Business	3-0-0	40	60	3	3
	20MBANC1	Employability Enhancement Programme	0-0-2				
	20110/11/02	TOTAL	27-0-2	360	480		27

SEMES Exam Slot	Course No.	Course Name	L-T-P	Internal Marks	End Semester Marks	Exam Duration (hours)	Credits
A	20MBA102	Marketing Management 2014	4-0-0	40	60	3	4
B	20MBA104	Financial Management	4-0-0	40	60	3	4
<u>с</u>	20MBA104	Human Resource Management	3-0-0	40	60	3	3
D	20MBA108	Operations Management	3-0-0	40	60	3	3
F	20MBA100	Operations Research	4-0-0	40	60	3	4

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20MBA112	Pasaarah fas Mana					
		3-0-0	40	60	2	2
20MBA114	Entrepreneurship Development	3-0-0	11.0.00		3	3
			40	60	3	3
		1-0-1				
	TOTAL	25-0-1	360	480		24
	20MBA114	20MBA114 Entrepreneurship Development	20MBA114 Entrepreneurship Development 3-0-0 20MBANC2 Integrated Disaster Management 1-0-1	20MBA114 Entrepreneurship Development 3-0-0 40 20MBANC2 Integrated Disaster Management 1-0-1	20MBA114 Entrepreneurship Development 3-0-0 40 60 20MBANC2 Integrated Disaster Management 1-0-1 1	20MBA114 Entrepreneurship Development 3-0-0 40 60 3 20MBANC2 Integrated Disaster Management 1-0-1

MBA SUMMER INTERNSHIP OUTSIDE THEROLLEGERGWEEKS to 8 WEEKS AM TECHNOLOGICAL

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
В	20MBA203	Business Analytics	4-0-0	40	60	3	4
С	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 Estd.	23-0-6	380	420		26

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PRINCIPAL MANGALAM COLLEGE OF ENGINEERING

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
В	20MBA204	Industry 4.0 and Al applications for Business	4-0-0 A [AM	60	3	4
С	20MBA	Elective VI TECLINIOI	3-0-0 (40,1	60	3	3
D	20MBA	Elective VII	3-0-0	401L	60	3	3
E	20MBA	Elective VIII UNIVER	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	\$3	с
20MBA213	Discovery of Self & Others	53	с
20MBA215	Organizational Change and Development	53	D

OMBA217	HRM Polices & Strategies	\$3	D
OMBA219	Industrial Relations and Labour Law	53	E
OMBA221	Global HRM	53	E
OMBA223	Human Resource Analytics	53	F
OMBA225	Leadership, Influence & Power INOIOCICA	S3	F
OMBA227	Reward Management	S3	G
20MBA229	Negotiations & Conflict Resolutions	53	G
20MBA212	Performance Management	S4	с
20MBA214	Management of Creativity & Innovation	S4	С
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
		/	Ant
Course No.	Finance Electives 2014	Semester	Exam Slot
	Financial Markets and Services	\$3	c

			Construction of
Course No.	Marketing Electives	Semester	Exam Slots
Co		1	
20MBA242	Financial Applications for Machine Learning	54	E
20MBA240	Insurance Management	54	E
20MBA238	Strategic Financial management Estd.	54	D
20MBA236	Financial Risk Management	54	D
20MBA234	Financial Derivatives	54	с
20MBA232	Financial Information Analysis	54	с .
20MBA249	NBFCs & Micro Finance	53	G
20MBA247	Financial Technologies	53	G
20MBA245	Statistics Methods for Financial Analytics	53	F
20MBA243	International Finance UNIVERSITY	53	F
20MBA241	Entrepreneurial Finance CHNOLOGICAL	53	E
20MBA239	Managing Banks and Financial Institutions II KALAM	53	E
OMBA237	Security Analysis and Portfolio Management	53	D
	Cost Accounting and Budget Control	53	D
OMBA235	Project Finance	\$3	C

20MBA251	Strategic Marketing Intelligence	\$3	c
20MBA253	B2B Marketing	53	c
20MBA255	Consumer Behavioura PI ARDI II KALAM	53	D
20MBA257	Services Marketing TECHNOLOGICAL	53	D
20MBA259	Integrated Marketing Communication ERSITY	\$3	E
20MBA261	Marketing Research	53	E
20MBA263	Retail Management	S 3	F
20MBA265	Sales & Distribution Management	S 3	F
20MBA267	Brand Management	S 3	G
20MBA269	Hospitality and Tourism Marketing	S 3	G
20MBA252	Social Marketing	S4	c
20MBA254	Customer Relationship Management Estd.	S 4	С
20MBA256	Rural Marketing	S 4	D
20MBA258	Strategic Marketing 2014	S 4	D
20MBA260	International Marketing	S4	E
20MBA262	Digital and Social Media Marketing	54	E

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Course No.	Operation Electives	Semester	Exam Slot
20MBA271	Supply Chain Management	53	с
20MBA273	Facilities & Location, Managemen BDUL KALA	M S3	С
20MBA275	Quality Management ECHNOLOGIC	AL S3	D
20MBA277	Six Sigma & TQM UNIVERSITY	S3	D
20MBA279	Business Process Reengineering	S3	E
20MBA281	Services & Operations Management	53	E
20MBA283	Healthcare Management	53	F
20MBA285	Decision Analysis for Management	53	F
20MBA287	Advanced Maintenance Management	53	G
20MBA289	Advanced Project Management	\$3	G
20MBA272	Technology Application and IPR Estd.	S4	C
20MBA274	Innovation and New Product Management	54	с
20MBA276	Business Planning for Small & Medium Eater Brises	S4	D
20MBA278	Managing Public Private Partnerships	S4 [0

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20MBA280	New Business Models	S4	E
20MBA282	World Class Manufacturing	\$4	E .

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Course No.	System Electives API ABDUL KALAM	Semester	Exam Slot
20MBA291	System Analysis and Design HNOLOGICAL	53	С
20MBA293	Global Information System NIVERSITY		C
20MBA295	Business Database System	53	D
20MBA297	Knowledge Management and IT/ ITES Consulting		D
20MBA299	Information Security and Risk-Management		E
20MBA301	Business Intelligence and Data warehousing	53	E
20MBA303	e-Business	S3	F
20MBA305	AI Strategies for Business		F
20MBA307	e-Governance	S3	G
20MBA309	Simulation for Managers		G
20MBA292	Business Data Mining 2014		с
OMBA294	Software Project Management	S4	С



20MBA296	Enterprise Resource Planning		D
20MBA298	Cloud Computing & Cyber Security		D
20MBA302	Enterprise Management in Digital era		E
20MBA304	Software Engineering PLABDIII KALAM	S 4	E

Course No.	General Electives UNIVERSITY	Semester	Exam Slot
20MBA311	Managing Employee Satisfaction	S3	С
20MBA313	Econometrics	53	D
20MBA315	Design Thinking	53	E
20MBA317	Social Entrepreneurship	\$3	F
20MBA319	Tourism Management	\$3	G
20MBA321	Hospitality management	S3	с
20MBA312	Management of NGOs Estd.	S4	с
20MBA314	Management of Sustainable Business	54	D
OMBA316	Family Business 2014	S4	E
OMBA318	Managing Contracts	54	с



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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 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



IANGALAM COLLEGE OF ENGINEERING



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CERTIFICATE

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0

This is to certify that

ASHIK DAS TH

Student of

MANGALALM 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

CIN:U72900KL2019PTC058909



Director TECHONE TECHNOLGIES PVT. LTD.

techonetechnologies@gmail.com

(CONTERAS) LANGELA



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CERTIFICATE

0

0

This is to certify that Dacena C Martin

Student of

Mangalam College of Engineering, Ettumanoor

Has completed 5 days internship training in ANDROFD APP DEVELOPMENT COMPLETED and since 2021 at Techcole Technologies. Proceed Weyartad During dus intern period, we found him her a sincere, horiest, hardworking-dedicated student with a protections attraide along with a very good professional knewledge. We wish you every success in all future enderstours.

Date: 14-06-2021

CIN 157290061.2019PTC058909



Director TECHONE TECHNOLGIES PVT 1.111

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PRINCIPAL IANGALAM COLLECE OF ENGINEERING Ethumanoor

Kerala State Electronics Development Corporation Ltd. (A Government of Kerela Undertaking)



ITBG - Knowledge Services Group GSTIN: 32AABCK1319E4Z5

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

KSG/60/INTP/20-01/L4258

17.01.2020

IPA! IANGALAM COLLEGE OF ENGINEERING

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.	K1960/110155
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 Kellron Knowledge Centre Municipal Shopping Complex

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



Regd Yomeen Kenren Yayase, Wellayambalam, Thiruvananthapuram, Kerala State, India. Pin:695 033, Tel: 0471-4094444 Temp No KYC/INIP/Type 1/3 02154 JULY Visit us at our website :http://www.keltron.org



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CERTIFICATE

0

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.

Date: 14-06-2021

CIN:U72900KL2019PTC058909



Dirèctor TECHONE TECHNOLGIES PVT. LTD.

techonetechnologies@gmail.com

INCINEERING TANGALAM CO



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CERTIFICATE

This is to certify that

CHANDRALEKHA.J

MANGALAM COLLEGE OF ENGINEERING

student of

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



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CERTIFICATE

This is to certify that ASHIK DAS TH Student of

MANGALALM COLLEGE OF ENGINEERING ETTUMANOOR

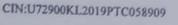
Has completed 5 days internship training in ANDROID APP DEVELOPMENT from 2nd june 2021 at Techone Technologies Pvt.Ltd, Wayanad.During this intern period, we found him/her a sincere, honest, hardworking, dedicated student with a professional attitude along with a very good professional knowledge. We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

Date: 14-06-2021

WAYANAD DT

Director TECHONE TECHNOLGIES PVT. LTD.

techonetechnologies@gmail.com



NANGALAM COL

Kerala State Electronics Development Corporation Ltd. (A Government of Kerala Undertaking)

ITBG - Knowledge Services Group GSTIN : 32AABCK1319E4Z5



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

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)

Head of Centre



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CERTIFICATE

This is to certify that

ASHIK DAS TH

Student of

MANGALALM 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

CIN:U72900K1.2019PTC058909



Director TECHONE TECHNOLGIES PVT. LTD.

techonetechnologies@gmail.com

INGRAM COLLEGE OF DISSERTABILIS

Kerala State Electronics Development Corporation Ltd. (A Government of Kerala Undertaking)

(EKE) U74999KL1972SGC002450

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/L4260

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	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, Arra Strings, Functions, Structure
	COMPLETED SUCCESSFULLY
Status	

Authorized Signatory (Knowledge Services)

Head of Centre

(SEDC LTD.

IANGALAM C

Temp No. 156/10/19/7por 1/2 01:04.2019

Keltron Knowledge Centre mbalam, Thiruvananthapuram, Kerala State, India. Pin:695 033, Tel: 0471-4094444 Municipal Shot ping Complex Regd. Office Ketton Holder Ve Visit us at our website : http://www.keltron.org

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



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CERTIFICATE

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HANGALANI COLLEGE OF ELICTIEERING

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This is to certify that

ASHIK DAS TH

Student of

MANGALALM 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.



Director

TECHONE TECHNOLGIES PVT. LTD.

techonetechnologies@gmail.com

CIN:U72900KL2019PTC058909

Date: 14-06-2021

Kerala State Electronics Development Corporation Ltd. (A Government of Kerala Undertaking)

ITBG - Knowledge Services Group GSTIN: 32AABCK1319E4Z5

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

KSG/60/INTP/20-01/L4262

17.01.2020

CIN: U74099KL1972SGC002450

CERTIFICATE

Certified that the Student has completed the Internship Program conducted at KELTRON as per the

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 5 d
Student's Registration No.	B. Tech in Computer Science & Engineering 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	05.01.2020 to 12.01.2020 (1 Week)
Area of Exposure	Programming Fundamentals, Control Statements, Arrays, Strings, Functions, Structure
Status	COMPLETED SUCCESSFULLY

Authorized Signatory (Knowledge Services)

> Head of Centre Keltron Knowledge Centre

KSEDG LTD

NGINEERING

Municipal Shopping Complex Nagampadam, Kotlayam-686 001 Regd. Office : Keltron House, Vellayambalam, Thiruvananthapuram, Kerala State, India. Pin:695 033, Tet: 0471-4094444 \$50/1W19/Ture 1/2 01 04 2019 Visit us at our website :http://www.kettron.org Doc. No : KSG/LH/07-19/007(5000)



techonetechnologies.in

CERTIFICATE

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This is to certify that ARSHAD ABOOBAKER

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

CIN:U72900KL2019PTC058909

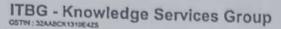
WAYANAD DT THE

Dirèctor TECHONE TECHNOLGIES PVT. LTD.

techonetechnologies@gmail.com

GIVEERING ANGAL

Kerala State Electronics Development Corporation Ltd. (A Government of Kerala Undertaking)





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

KSG/60/INTP/20-01/L4257

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	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 Common B. Tech in Common State (KTU), Kerala
Student's Registration No.	B. Tech in Computer Science & Engineering 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
Online Portal Registration No.	Pala – 686575, Kerala 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 Kettron Knowledge Centre Municipal Shooping Complex 11 complicant, Kottayam-686 001

PRINCIPAL IANGALAM COLLEGE OF ENGINEERING Ettumanoor

temp no associate/Tipe 1/2 01 04 2024

Regd. Office : Keltron House, Vellayambalam, Thiruvananthapuram, Kerala State, India. Pin:695 033, Tel:0471-4094444 Visit us at our website : http://www.keltron.org



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

NGINEERING

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3

Santhosh Kurup Chief Executive Officer

Damaria

lbssoftware





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



Santhosh Kurup Chief Executive Officer



	-	
ANGALAM (PRINCIPAL COLLEGE OF ENGINEERING	

TATA





Ibssoftware





techonetechnologies.in

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

CIN-U72900KL2019PTC058909



Director TECHONE TECHNOLGIES PVT. LTD.

techonetechnologies@gmail.com

IANGER CONTRACTOR CONTRACTOR

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techonetechnologies.in

CERTIFICATE

This is to certify that

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 Pv1Ltd. 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 TECHNOLGIES PVT. LTD.

techonetechnologies@gmail.com

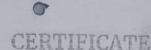
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CIN:U72900KL2019PTC058909

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ENGINEERING





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17

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 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

CIN:U72900KL2019P1C058909



flore

Director TECHONE TECHNOLGIES PVT. LTD.

techonetechnologies@gmail.com



techonetechnologies.in

CERTIFICATE

This is to certify that

HARSHA WILSON

Student of MANGALAM COLLEGE OF ENGINEERING ETTUMANOOR

Has completed 5 days internship training in ANDROID APPOEVELOPMENT 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 endersours.

Date: 14-06-2021

CIN LIT29008.1.2019/TC055909 MNGALAM



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fler

Director TECHONE TECHNOLGIES PVT. LTD.

techonetechnolognessis gnual com



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



Antony Francis Rajan

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



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



Antony Francis Rajan

Managing Partner Alphasys 3D Printing Solutions EastMarady, Muvattupuzha



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



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

CERTIFICATE OF APPRECIATION

This is to certify

Ms. Ganga P Chandran

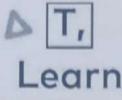
For meritoriously completing internship with Tidbeat as ASSOCIATE SOFTWARE TRAINEE starting from 13th April, 2021 to 8th July, 2021. All the best!

Date

8th JULY, 2021

Director A Achillin Kelly A. Achitha Reddy

PRINCIPAL IANGALAM COLLEGE OF ENGINEERING Ethumonoor



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



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



1ANGALAM C

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 AM

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/

HING DIRECTOR

PRINCIPAL IANGALAM COLLEGE OF ENGINEERIN Suven Consultants & Technology Pvt. Ltd.

Official member to

() HackerRank shine:

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 - TTTT 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=Y3JIYXRpdmVmZWxsb3dzcmVIMjIyQHNjdHBs

Sours.

Date of Issue: 01-02-2021 This is auto generated by our all engine

Domain Expert: Rocky Jagtiani Technical Head - SCTPL https://suvenconsultants.com Domain Expert: Nite SharmaColl UI/UX expert and Software Engineer NeoSOFT Technologies Domain Expert: Tarik Sheth MCP.HP(AIS).CSTE.CSQA.CSTM VP(in Investment Banking MNC)





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



IANGALAM C



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

JANGALAM COLL

VGINEERING

Carnino Infotech CUSAT PO Kalamassery, Kochi, Ernakulam





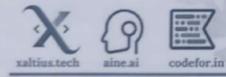
THE SPARKS FOUNDATION INSPIRE, INNOVATE, INTEGRATE

CERTIFICATE OF COMPLETION

This Certificate is presented to

Luv 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.



COLLABORATIVE PARTNERS

mana

PRANAV DUBEY

MANAGING DIRECTOR

Certificate Number: 2GQCNKNS6X Verify at www.thesparksfoundation.info/verify

acnove

Date: 26/09/2020

IO 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



IANGALAM COLLEGE O

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



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

Camino Infotech CUSAT PO Kalamassery, Kochi, Ernakulam

IANGALAM COL



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

Camino Infotech CUSAT PO Kalamassery, Kochi, Ernakulam





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.

Authorized Signatory

Camino Infotech CUSAT PO Kalamassery, Kochi, Ernakulam





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



IANGALAM COLLEGE OF ENGINEERING



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

ABHI KRISHNA H CEO



Date Signed



9001:2015



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

ABHI KRISHNA H CEO



Date Signed



11/25/21. 10:05 PM

TORC INFOTECH

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TORC INFOTECH PRIVATE LIMITED

JORC DECHER DEDITORIO KALAMANSERY KOCHERTRALA

SI NO TORTX621

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

SEAL ABHI KRISHNA H

CEO



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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

VANGALAM CO.

ABHI KRISHNA H CEO



Date Signed



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TORC INFOTECH PRIVATE LIMITED

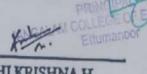
TORC INFOTECH OLD ROAD, KALAMASSERY KOCHI, KERALA

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



ABHI KRISHNA H CEO



Date Signed



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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

INGINEERING ANGALAM C

Camino Infotech CUSAT PO Kalamassery, Kochi, Ernakulam





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

Camino Infotech CUSAT PO Kalamassery, Kochi, Ernakulam

GINEERING





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.

Authorized Signatory

Camino Infotech CUSAT PO Kalamassery, Kochi, Ernakulam



ANGALAM GOLLEGE OF ENGINEERIN



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.

Authorized Signatory

ANGALAM (

Camino Infotech CUSAT PO Kalamassery, Kochi, Ernakulam

RINO(PA) DLLEGE OF ENGINEERING Ettumanoor



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.

Authorized Signatory

IANGALAM

Camino Infotech CUSAT PO Kalamassery, Kochi, Ernakulam

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

OF ENGINEERING AANGALAM COLLEGE

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



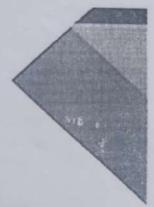
Certified that Ms. Aswathy N, student of Mangalam College of Engineering, Ettumanoor, Kerala has successfully completed 15 Days Internship programme on "Machine Learning" offered by CAMINO INFOTECH Pvt.Ltd from 24-04-2021 to 08-05-2021.

Authorized Signatory

Camino Infotech CUSAT PO Kalamassery, Kochi, Ernakulam

PRINCIPAL MANGALAM COLLEGE OF ENGINEERING Ethumshoor





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.

Authorized Signatory

ANGALAM (

Camino Infotech CUSAT PO Kalamassery, Kochi, Ernakulam



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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

Camino Infotech CUSAT PO Kalamassery, Kochi, Ernakulam



OF ENGINEERING AANGALAM C



Certified that Ms. Alswarya Saji, 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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Camino Infotech CUSAT PO Kalamassery, Kochi, Ernakulam



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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, Ernakutam



PRINCIPAL IANGALAM COLLEGE OF ENGINEERING Ettumanoor A ART / tects ARCHITECTS.PLANNERS 6 URBAN DESIGNERS NILANBUR Ph: 9946208068, \$891206068 Email: aastabre values com NRT Complex.VK Road Nilambur Pin: 679329

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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

RC

Authority Signature

ENGINEERING IANGALAM

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 curriculam.

Gandhinagar 09.07.2018



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



PUBLIC WORKS DEPARTMENT ROADS SUB DIVISION, THIRUVALLA

PIN-GENIOT

CERTIFICATE

This is to certify that Ms. Jetcy Elizabeth Philip, 2rd Semester, Civil Engineering Student of Mangalam College of Engineering, Vettimukal .P.O, Ettumanoor, Kottayam has been successfully Completed 5 days Internship Training from 92/07/2018 to 06/07/2018 under this Office.

Thiruvalla, 10-07-2018



t Executive Engineer Assis C Baguan D. (Raads) Sale Divisi

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

···· 30/08/2019



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



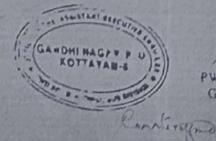
Assistant Executive Engineer Assistant Executive Engine F. W. D. (Roads) Sub Divisi Whirevelle

Office of the Asst. Executive Engineer PWD Special Buildings Sub Division Gandhinagar.P.O., Kottayam-680008 Ph: 0481 2597218 Pwdspfbldgs@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 fulfiliment of her B.Tech curriculam.

Gandhinagar 27.06.2018



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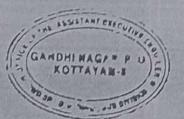
ANGALAN COLUMP OF ENDINEERING

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

CERTIFICATE

¹ Certified that Miss. Theressa 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 curriculam.

Gandhinagar 27.06.2018



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Assistation Executive Enginee PWD SPL Buildings Sub Division Gandhioans: P.O. Kottevam - *

പുകസികുട്ടില് നമ്പോനുമു പൊതുതോമതി വച്ചപ്പ കെട്ടിവിദാഗം,കോട്ടതം - 2

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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 curriculam.

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Gandhinagar 27.06.2018

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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 fulfiliment of her B.Tech curriculam.

heer Gandhinagar Ision Gandhi Kottavam 27.06.2018 എക്സിക്യൂട്ടിറ പൊതുങ്ങളാണ്ണിവകുപ്പ ດລຽງຣາມໄຮງເທດ,ເລວຽເພດ-2 GINEERING

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INDUSTRIAL TRAINING CERTIFICATE

This is to certify that Mr. Jaho Abrham James (Reg No. MLM17CE059) pursoing his 2rd somether & Tech in Civil Engineering from Mangalam College of Engineering, Ettomanoor Kottayam has completed an industrial Training at Asset Homes Pv1 Ltd from 10.07.2018 to 18.07 2018

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

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

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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 Homen Wimited OCHI-36 Seema avadevap Sr. Manager - HR & Admin

ANGALAM COLL

ASSET

Responsibly Yours

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 Hamps Rut Limited NOCAI-36 Seema Sr. Manager HR & Admin

PRINCIPAL MANGALAMACCALEOS DE ENGINEERING

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 <u>Semester B</u>, 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 SPL Buildings Sub Division 'andhinagar P.O. Kottayam - 8

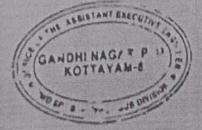
Office of the Asst. Executive Engineer PWD Special Buildings Sub Division Gandhinagar.P.O., Kottayam 686008 Ph. 0481 2597218 pwd/sptbldgs@gmail.com.

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

tulfillment of her B.Tech curriculam.

Gandhinagar 16.07.2018



Assistant Executive Engineer

Astistant Executive Engineer PWD SPL Buildings Sub Division 'iandhinagar P.O., Kottayam - 8

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

Gandhinagar 16.07.2018



TANGALAM COLLECE OF ENGINEERING

Assistant Executive Engineer Assistant Executive Engineer PWD SPL Buildings Sub Division Gandhinggar ⁵ O. Kottayam - 8



KERALA WATER AUTHORITY

Office of the Executive Engineer Project Division, Advar, Phone: - 04734-224839 e-mail-pidadoor@gmail.com DATE: 12.07.2015

No. PULLAI L'EIN/2018

TO WHOM IT MAY CONCERN

This is to certify that Miss. Merrin JosefReg. No. MLM17CE069] student of mercond atmoster Civil Engineering, Mangalam College of Engineering, Ettumanoor, Entravani has successfully completed five day internship from 05.07.2018 to 10.01 2018 and submitted a detailed report regarding the same under the supervision of this office for the partial fulfillment 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, ADDDB

24.07.2018

INDUSTRIAL TRAINING CERTIFICATE

Respondship 120

This is to certify that Mr. Yadhu Krishnan K.M (Reg No. MLM17CE103.) pursuing his 2 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 Harpesphil Demited CHI-36 Seema Sr. Manager - HR & Admin

14 A. Pasanipilly Nager, Kocht 582 036. Tel: +91-484-2324999, 7321999, Fax: +91 484 2320899 Email-mail@assethomesiat | www.assethomesia

MANGALASS

PO ID 0 102/2017 dt 09.07.2010

CERTIFICATE

This is to certify that Sri Asian Javan, Francis Joseph, <u>Nandbu Pradeep</u>, <u>Jithin</u> Somarajan, <u>R. Rojat, J. Anand Sankar and Thomas Siby</u>, 2nd semester B. Tech students of Mangalam College of Engineering has attended the construction site of building for Architecture Block at Rajar Gandhi insultate of Technology Kottayam from Duilding for Architecture Block at Rajar Gandhi insultate of Technology Kottayam from

by the students for submitting to the college authorities.



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സ്ഥികുമാർ കെ. മി. മാനിയര്, എണ്ടിതിയർ പൊതുമ്പാടത്ത് വകുർ കെട്ടിട വിന്നം തെക്ഷൻ

Antony Thomas Contracting Pvt. Ltd.

23/1883 A. (46/3607), Adabpility Road Vennala, Kochi - 682 028 Phone 0484 - 2809051 Mob 9544500820 Email atengg@gmail.com Website www.atol.co

STIN: 32AAJCAST31E1Z4

23-07-2018

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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

Office of the Asst. Executive Engineer PWD Special Buildings Sub Division Gandhinagar.P.O., Kottayaan- 686008 Ph: 0481 2597218 pwdsplbldgs agmail.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 curriculam.

> GANDHINAGI KOTTAYAGI Banana Angerika KOTTAYAGI Banana Angerika
Assistant Executive Engineer Assistant Executive Engineer PWD SPL Buildings Sub Division Tandhinagar P.O. Kottayam - 8

Gandhinagar 09.07.2018



PUBLIC WORKS DEPARTMENT ROADS SUB DIVISION, THIRUVALLA PIN-689101

CERTIFICATE

This is to certify that Ms. Sarah Mariam Abraham, 2^{ed} 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 BACCHINE ENginee MONTERING P. W. D. (Roads) Sub Diriel

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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 Assistant Executive Lagrac. F. W. D. (Roads) Sub Divid. Whiruvalla SITURE WORKS DEPARTMENT

Office of the Asst. Executive Engine PWD Special Buildings Sub Divisio Gandhinagar,P.O., Kottayam- 58608 Ph: 0481 259721 pwdspibldes diamail.com

CERTIFICATE

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

Gandhinagar 09.07.2018

DIVISIO

Assistant Executive Engineer

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

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

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 curriculam.

Gandhinagar 16.07.2018



Assistant Executive Engineer Assistant Executive Engineer PWD SPL Buildings Sub Division 'Jandhinagar P.O. Kottayam - Sl

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 curriculam.

Gandhinagar 09.07.2018



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



PUBLIC WORKS DEPARTMENT ROADS SUB DIVISION, THIRUVALLA

P36-438101

CERTIFICATE

This is to certify that Ms. Jetcy Elizabeth Philip, 2^{re} Semester, Civil Engineering Student of Mangatam 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



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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 Assistant Executive Degen F. W. D. (Roads) Sub Divisit Viruvalle

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

ANGACAU CO

DEPARTMENT OF MANAGEMENT

MANGALAM COLLEGE OF ENGINEETING, KOTTAYAM



This is to certify that this Internation Report is a bonafide record of the work done By NANDANA NANDARUMAR (Reg No - MIM19MBA60) as a part of the Internship work during the Third transster at keltran Cantrols. Lul in partial hilfillment of the requirements for the award of the degree of MASTER (if EUSINESS ADMINISTRATION of A P J Abdul Kalum Technological University, Thirusaneuthopurum Under the guidance of Ms.FATHIMA SHIRIN SHAJI, Assistant Professor, Mongalum College of Engineering, Ethamanoar,

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Faculty Guide

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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.

Prof. JOISN ANA RUTE Professor and Head **Faculty Guide** Ms. FATHIMA SHIRIN SHAJI Dawn, Department of Manah and Children Assistant Profession DR. SIBU C. CHITHBAN Mangalan elleya al manaenina WBA, M. Pot, (DP articiped) from Assistant Professor En numeral in the trol. & Head, Dout, of Management Station Deperiment of Management Studies, Mang dam College Dr Engineering Mengalam College of Engineering, Ettamenoor, Kettayam Antravam MANGALAM COLLEGE OF ENGINEERING PRINCIPAL Fitumanoor ii

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.

aculty Guide

Ms. JEENU MATHEW Anistian Professor Mineot Of Management Soudies Mgalaan College Of Englishering Ethammoor Potleyoni



Head of Department

IANGALAM COLLEGE OF ENGINEER

OR. SIBU C CHITHHAN NSA.M. Hui, TPP (HMK) PhD (Mgmt) grot. & Hoad, Dept. of Management Studies Mangalaw College Of Engineering Etymanoor, Kottavam

DEAN OF THE DEPARTMENT

Prof. JOHN T. VARUCHESE Dean, Department of Management Studies, Mangalan College of Engineering Eltumation, Fordayam

DEPARTMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR

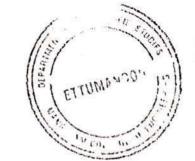


CERTIFICATE

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. DC' Y DEVASSY Assistant Professor Department of Management Studies Mangalam College of Engineering Ettumanoor, Kottayam



DR SIGU C CHITHRAN

MBA, M.Phil, FIP (IIMK) PhD (Mana) Prof. & Hoad, Dept. of Management Studier Mangalam College Of Engineering Ettumanoor, Kottayam

PRINCIPAL MANGALAM COLLEGE OF ENGINEERING

Prof. JCH11 T. V.JCOCHESE Dean, Department of Managemont Studies, Mangman Ludlege of Engineering Ethning.con, H. Jayam

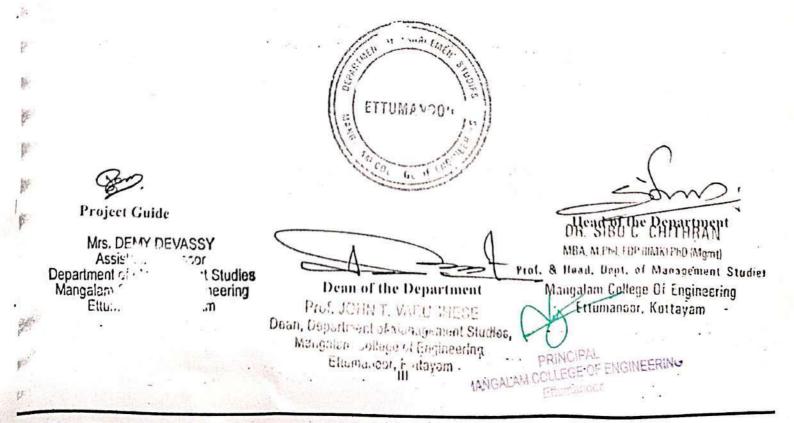
Dean of the Department

DEPARTMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE OF ENGINERRING 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.





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 is any form has not been submitted to any other University or Institute for any purpose.

NYAR BESE Internal Supervisor(s)

External Supervisor(s)

Dr. D RAMESH KUMAR HEAD OF THE DEPT

Ettomanoor

UG Coordinator



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

athy Soman

Dr.D.Rameshkumar

Assistant Professor Project Coordinator



CERTIFICATE

This is to certify that the report entitled "IMPACT OF HEAVY VEHCLES 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

Ethuma D.Ramesh Kumar

IANGALAM CO

DEPARTMENT OF CIVIL ENGINEERING

MANGALAM COLLEGE OF ENGINEERING,

ETTUMANOOR



CERTIFICATE

This is to certify that the report entitled "IDENTIFICATION OF BLACKSPOTS ON NATOINAL 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



Assistant Professor

Project Coordinator

PRIMCIPAL HANG/ esh Kumar



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

v Soman

Assistant Professor

Dr.D.Ramesh Kumar

Head Of Department

MANGALAM CO

Assistant professor

Project Coordinator

Guide

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

ENGINEERING



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.

AdhithyaVishwambaran Assistant professor

Guide

AswathySoman Assistant Professor Project Coordinator

ENGINEE shkumar



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.

R. Serlich

Dr. R Senthil Kumar Associate Professor Guide



Aswathy Soman Assistant Professor Project Coordinator

INEERIN

Head of Deparment

D Rameshkumar



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

CERINK ADNG D. Rameshkumar



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 kuman

Assistant Professor

Assistant Professor

(Project Cordinator) (H

Professor ANGALAN COLL (Head of the Department)

(Guide)

ii



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.

ATHY SOMAN

ADITHYA V

(Guide)

Assistant Professor

(Seminar Coordinator)

Assistant Professor

ENGINEERING

Dr. RAMESH KUMAR

Professor

(Head of the Department)

ii



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 Cordinator)

(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)



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



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.

Sreerench Raghavu

Sharon Treassa Biju

Dr.D Rameshkumar

Assistant professor

Assistant professor.

Head of Department

(Guide).

(Seminar Coordinator).

DEPARTMENT OF CIVIL ENGINEERING

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

MANGALAM

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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.

Vilbin Varghese Assistant Professor. (Guide)

74

Sharon Treassa Biju Assistant Professor. (Seminar Coordinator)

NGINEERING ANGALA

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) Dr.Ramesh kumar Professor (Head of the Department)

ANGALAM

ENGINEERING

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) Dr.Ramesh kumar Professor (Head of the Department)

CALORICECTIPICS



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)

ii

Dr. RAMESH KUMARGINEERING

Professor

(Head of the Department)



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)

dillet

Aswathy Soman,

Assistant Professor (Seminar Coordinator)

ENGINEERING IANGALAM C

Dr.D.Ramesh Kumar, Professor

(Head of the Department) ii



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.

Ju.

Athulya Tom, Assistant Professor (Guide)

Aswathy Soman, Assistant Professor (Seminar Coordinator)

FENGINEE Ethimaneor

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



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.

Assistant Professor Guide

Aswathy Soman

DF.D. Rameshkumar

Assistant Professor **Project Coordinator**



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



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)

ENGINEERING ANGALAM.

Dr. D. Ramesh Kumar Head of Department



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



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

Dr.D. Rameshkumar

ENGINEERING

Head of Department

Project Coordinator



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 Assistant Professor. (Project Coordinator)

Dr. D. Ramesh Kumar



CERTIFICATE

This is to certify that the report entitled "DESIN,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 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



CERTIFICATE

This is to certify that the report entitled "DESIN,MODELLING AND ESTIMATION OF POLYTECHNIC BUILDING IN MANGALAM CAMPUS" is the authentic record of the seminar presented by AGNESHIA 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. Rameshkuman



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.

R. Sul Dr. Senthil Kumar Associate Professor (Guide)

Mr. Vilbin Varghese Assistant Professor (Project Coordinator)

ANGA

Dr. D. Ramesh Kumar



CERTIFICATE

This is to certify that the report entitled "DESIN,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 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

DEPARTMENT OF CIVIL ENGINEERING

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 GUIDENCE AND SUPERVISION. This report in any form has not been submitted to any other University or Institute for any purpose.

Mr. Vilbin Varghese

Mr. Vilbin Varghese

Dr. D-Rameshkumar

IANGALAM C

Assistant Professor

Assistant Professor

Head of Department

Guide

Project Coordinator



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)

E ENGINEERING Ramesh Kumar



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**

Dr.D. Rameshkumar



CERTIFICATE

This is to certify that the report entitled "DESIN, 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 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

MGINEFRING Dr.D. Rameshkumar



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)

ENGINEERING Dr. D. Ramesh Kumar



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

mlung

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

IANGALAM COLLEGE OF ENGINEERING Ettumanoor

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

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 Engineeringtowards the partial fulfillment of the requirement for the award of the DEGREE OFBACHELOR OF TECHNOLOGY by APJ ABDUL KALAM TECHNOLOGICALUNIVERISTY, 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

ANGALAM COLLEGE OF 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 Sainudoga

Assistant Professor

Dept. of Computer Science

External Supervisor

Head of theDept. Dr.Sunitha E V Associate Professor &HOD

Dept. of Computer Science



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.

Interna

Ms. Sruthy Emmanual Assistant Professor Dept. of CSE

Head of the Dept.

Dr. Sunitha E V

Professor & HOD

Dept. of CSE

PRINCIPAL IANGALAM COLLEGE OF ENGINEERING Ettumanoor



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.

ANGALAM

Internal Supervisor Ms. Jinu P. Sainudeen

Assistant Professor

Dept. of Computer Science

UG Coordinator Ms. Jinu P Sainuded

Assistant Professor

Dept. of Computer Science

External Supervisor

Awelland CF ENGINEERING

Head of the Dept.

Dr. Sunitha E V

Associate Professor & HOD

Dept. of Computer Science

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

ANGALAM COLLEGE OF ENGINEERING Ettumanoor



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 Coordinater

Ms. Jinu P Salnudeen

Assistant Professor

Dept. of Computer Science

External Supervisor



Head of the Dept.

Dr. Sunitha E V

Associate Professor & HOD

Dept. of Computer Science



DEPARTMENT OF COMPUTER SCIENCE & E NGINEERING 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

ENGINEERING EGE OF ANGALAM C Filumanoor

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

When a

Head of the Department

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

E OF ENGINEERING tumanoor

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. Siny Mary Kurian

Assistant Professor Department of CSE, MLMCE

PRINCIPAL AANGALAM COLLEGE OF ENGINEERING



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



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 Department of CSE, MLMCE

Head of the Department

Dr. Sunitha E.V Associate Professor & Head Department of CSE, MLMCE

GE OF ENGINEERING Ettumancor

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), Lekshmipriya 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. Diver S.B Assistant Professor Department of CSE, MLMCE

ANGALAM COLLEGE OF ENGINEERING



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

Assistant Professor Department of CSE, MLMCE

ANGALAM COLLEGE OF ENGINEERING



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

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

Mr.Vishnu S Sekhar Assistant Professor Department of CSE, MLMCE

Head of the Depa

Dr. Sunitha E.V Professor & Head Department of CSE, MLMCE

MANGALAM COLLEGE OF ENGINEERING

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.

mernal Guide

Ms. Neena Joseph Assistant Professor Department of CSE, MLMCE

PRINCIPAL NANGALAM COLLEGE OF ENGINEERING

Head of the Department Dr. Sunitha E.V Professor & HOD Department of CSE, MLMCE

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

Interna

Prof. Chris Chettisery Assistant Professor Department of CSE, MLMCE

ANGALAM CC



Head of the Department

Dr. Sunitha E.V Professor & Head Department of CSE, MLMCE

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

> ANGALAM COLLEGE OF ENGINEERI Etymanoor



Internal Guide

RINCIPAL ENGINEERING Head of the Department

Ms. Neema George Assistant Professor Department of CSE, MLMCE

Dr. Sunitha E.V Professor & Head Department of CSE, MLMCE

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.

rhal Guide nt

Dr. Ranju S Kartha Associate Professor Department of CSE, MLMCE

Head of the Department Dr. Sunitha E. V Associate Professor& Head Department of CSE, MLMCE

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

Ms. Gayathri R Krishna Assistant Professor Department of CSE, MLMCE

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



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

Sneha Mathew

Assistant Professor Depts of CSE

WINGALAM COL

GNEEHead of the Department

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

DEPARTMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE OF ENGINEERING, KOTTAYAM



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.

UNEDDE Head of the Department aculty Guide MS. JEENIL MATHEW DR. SIBU C CHITHRAN Assistent Protection MBA. M.Phil, FDP (IIMK) PhD (Mgmi), D.L. Professor & Head. (Management Studies Departer of OUL wineeing . 110 Mangalam College of Engineering 11 Dean of the Department Ettumanoor, Kottayam 1110 mar and the strate Prof. (Dr) JOHN T. VARUGHESE Dean. Department of Management Studies Mangalam College of Engineering Ettumanoor, Kottayam ENGINEER!NG ANGALAM COLLEGE OF Ettum ...cor

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 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.

Head of the department **Project Guide** Ms. JEENU MATHEW DR. SIBU C CHITHRAN MBA. M.Phil,FDP (IIMK) PhD (Mgmil), DLUt Professor & Head. (Management Studies) Assistant Professor **Department Of Management Studies** Mangalam College Of Engineering Mangalam College of Engineering Ettumanoor, Kottayam Ettumanoor, Kottayam Dean of the department Prof. JOHN T. VARUSHELE Dean Department of Management Lineson un galan College of Vitaniouting Ettumu. . . . Justuren ETTUMAN MANGALAM COL

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 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

BOSE TOM Associate Professor Department of Monager 1999 Studius Mangalam College of Engine ar Ellumandor, Kottayam



Dean of the departmen Dean of the departmen Dean of the departmen

Head of the department

Prof. JOHN T. VARUMARNE Dean. Department of Management of Management Biologitan College of Concerning Ethoma.met. Setteram DEPARTMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE OF ENGINEERING ETTUMANOOR, KOTTAYAM



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.

Sol Head of the Department **Project Guide** Ms, THETA HAHT DR. SIBU C CHITHRAN Asanciate Professor Repartment of Minegement Studios MBA. M.Phil, FDP (IIMK) PhD (Mgmt), D.Litt Professor & Head: (Management Studies) Mangalam Chilege of Familyancing Ettomanger Sottay Dean of the Department Mangalam College of Engineering Ettumanoor, Kottayam Prof. (Dr) JOHN T. VARUGHESE Dean. Department of Management Studies ANGALAM COLLEGE OF ENGINEERING Mangalam College of Engineering Ettumanoor, Kottayam Ettumanoor



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.

Dr.Sibu C.Chithran

Head of the Department

DR. SIBU C CHITHRAN MBA. M.Phil,FDP (IIMK) PhD (Mgmt), D.Lit Professor & Head. (Management Studies Mangalam College of Engineering Ettumanoor, Kottayam

Prof. JOHN T. VARU HEBE Denn Department of Management Studian, Mongalan College of Stationality Ethoman M. Sustained



Mrs.Jeenu Mathey

Assistant Professor

(Faculty Guide)

Ms. JEENU MATHEW Assistant Professor Department Of Management Studies Mangalam College Of Engineering Ettumanoor, Kottayam Dean 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 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 Dr. Sibu .C. Chithran **Associate Professor** TURAN Head of the department DR. SIBU C CHITHRAN MBA: M.Phil, FDP (IIMK) PhD (Mgmt), D.Litt **Project Guide** BOSE TOM Professor & Head. (Management Studies) Associate Professor Mangalam College of Engineering Department of Manager Mangalam Collows of Engine Etyme . . Prof. John. T Varghese Dean of the department Prof. JOHN T. VARUCHTEE Dekn. Department of Management + "restors, tan igatan: College of the lowering PRINCIPA IANGALAM COLLECE OF ENGIN Etuma.--- Sastayate

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DEPARTMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE OF ENGINERRING ETTUMANOOR, KOTTAYAM



CERTIFICATE

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

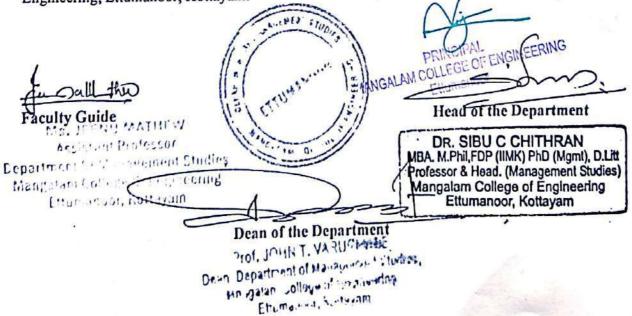
AANGALAM COLLEGE OF ENGINE Head of the Department roject Guide MS-FINTA GEORGE Assistent Indessor Department Management Studies are of Engineering can of the Department Ettuniariour, noitayam - 686 631 Prof. (Dr) JOHN T. VARUGHESE I Dean. Department of Management Studies ETTUNE Mangalam College of Engineering Ettumanoor, Kottayam 3

DEPARTMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE OF ENGINEERING, KOTTAYAM



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 Deapartment of Management Studies, Mangalam College of Engineering, Ettumanoor, Kottayam.



DEPARTMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR



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 MANAGEMT STUDIES, MANGALAM COLLEGE OF ENGINEERING.

ANGALAM C Eturnanoor Faculty Guide Head of the Department 12 . DR. SIBU C CHITHRAN MBA. M.Phil,FDP (IIMK) PhD (Mgmt), D.Litt Professor & Head. (Management Studies) Mangalam College of Engineering Ettumanoor, Kottavam Dean of the Department TOT. J. IN L. VA RUMMENE Chan Department of Ha Hymnand Dimess, ante of plan solies a stransouring Enumainer, Austry and

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 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

Ms. JEENU MATHEW Assistant Professor Department Of Management-Studies Matta: Lim College Of Engineering Ettumanoor, Kottayam



Dean of the Department Prof. JOHN T. VARU Deen Department of Management 1 11 sa galan Jollaya di n Lucollag Enumer -1, Colaram

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DR. SIBU C CHITHRAN MBA. M.Phil, FDP (IIMK) PhD (Mgml), D.Litt Professor & Head. (Management Studies) Mangalam College of Engineering Ettumanoor, Kottayam

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



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 dane by KAVYA M.P of Department of Management Studies, Mangalam College of Engineering, Ethamanoor, Kottayam

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Head of the Department

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Dean of the Department

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

DEPARTMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE OF ENGINEERING KOTTAVAM

CERTIFICATE.

 A. A. M. ANDRY HARTEN COMPARY MAILED A STUDY ON PINANCIAL NUMPERT AND ANALASS, ITANTEN COMPARY MAILTED THREE AN ANALYTICS AND ADDR ADDRESS IN ANTINIAL DOS (MEACHINES SALE) in partial induition of the express ments for the point of the degree of one discoursed frequence administration for a biological trans d of the project - A date for the different in Discourse administration for a biological trans d of the project - A date for the different in Discourse administration for the sources of the project - A date for the different in Discourse and American and Manuferrent studies. Manuferrant information of the project
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Head of the Department

DH. SIBU C CHITHRAN MAA M. HARPON (MAN) PERMONA DUN Perhawar & Hani (Management Suches) Mangateur Catego of Engineering Elleranger, Koolyaan

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



CERTIFICATE

This is to certify that the report titled "A STUDY OF AWARENESS AND ACCEPTANCE LEVEL OF JK CEMENT PRODUCTS AMOUNG DEALERS" being submitted by MS.POURNAMI PRASAD, Reg No: MLM19MBA67, 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 PRASADof Department of Management Studies, Mangalam College of Engineering

Faculty Guide Head of the Department DR. SIBU C CHITHRAN MBA. M.Phil,FDP (IIMK) PhD (Mgml), D.Litt Professor & Head. (Management Studies) JITHIN JOHN Assistant Professor Dept. of Management Studies Mangalam College of Engineering Mangalam College of Engineering Ettumanoor, Kottayam Ettumanoer Dean of the Department Prof. (Dr) JOHN T. VARUGHESE Dean. Department of Management Studies ETTUMA Mangalam College of Engineering Ettumanoor, Kottayam IANGALAM CO ii

DEPARTMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE OF ENGINERRING 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

PAL ENGINETICad of the Department

Dean of the Department

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

Ettumanoor, Kottayam

DR. SIEU C CHITHRAN MBA. M.Phil,FDP (IIMK) PhD (Mgmt), D.Litt Professor & Head. (Management Studies) Mangalam College of Engineering Ettumanoor, Kotlayam

ETTORAMINA

DEPARTMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE OF ENGINEERING

ETTUMANOOR, KOTTAYAM



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. MLM19MBA86). 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

SIBY JAMES NON Head of the Department Associate Professol of Management St 379.4 plam Ca marion, YSAID) Dean of the Department PRINCIPAL PRINCIPAL Ellumanoor Prof. (Dr) JOHN T. VARUGHESE Dean, Department of Management Studies Mangalam College of Engineering Ellumanoor, Kollayam

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



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

Faculty Guide

JITHIN JOHN Assistant Professor Dept. of Management Studies Mangalam College of Engineering Ettumanoor

Head of the Department DR. SIBU C CHITHRAN MBA. M.Phil,FDP (IIMK) PhD (Mgml), D.Litt Professor & Head. (Management Studies) Mangalam College of Engineering Ettumanoor, Kottayam

Dean of the Department

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

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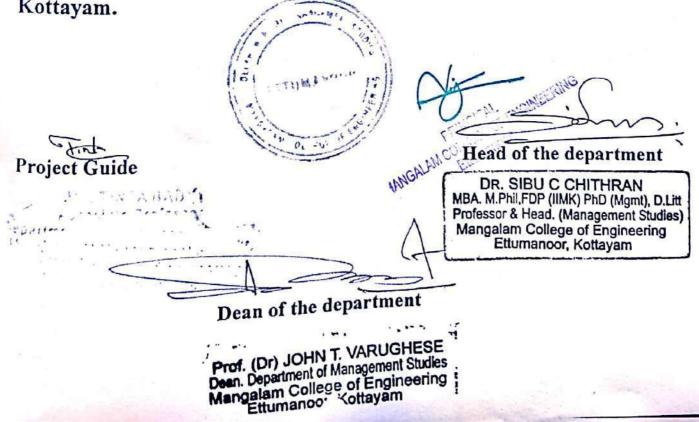
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DEPARTMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE OF ENGINEERING, KOTTAYAM



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 ALAPPUZHA", in partial fulfilment CORPORATION of the degree requirements of the 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.



DEPARTMENT OF MANAGEMENT STUDIES 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

Head of Department

3

Dean of the Department

DR. SIBU C CHITHRAN MBA. M.Phil,FDP (IIMK) PhD (Mgmt), D.Litt Professor & Head. (Management Studies) Mangalam College of Engineering Etturnanoor, Kottayam Prof. JOHN T. VARIDONSE Down, Department of Harrison and Blutter Mangalan Lolinge of Essemating Esseman, Sustay that

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DEPARTMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE OF ENGINEERNIG, ETTUMANOOR, 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.

Head of the Department Faculty Guide DR. SIBU C CHITHRAN JITHIN JOHN Assistant Professor MBA, M.Phil, FDP (IIMK) PhD (Mgmt), D.Litt Dept. of Management Studies Professor & Head. (Management Studies) Mangalam College of Engineering Mangalam College of Engineering Ettumanoor, Kottavam Ettumanoor Dean of the Department Prof. (Dr) JOHN T. VARUGHESE Dean. Department of Management Studies Mangalam College of Engineering Ettumanoor, Kottayam NGINEERING 2 IANGALAM COL

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.

FTTUMAN Head of the department Project Guide BOSE TOM DR. SIBU C CHITHRAN Associate Prolessor MBA. M.Phil, FDP (IIMK) PhD (Mgmi), D.Litt "partment of Management Studies "family im College of Engineening Professor & Head. (Management Studies) Mangalam College of Engineering : tumanoor, Kottayam Ettumanoor, Kottayam Dean Department of MajaNGALAM COLLEGE OF ENGINEERING Dean of the department Min galan Jolleys of the simerin Eltumenoor Enuma. Lewiste 11

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.

OLLEGE Cit AAMGALA Ettumanoor Dean of the department Head of the department **Project** Guide

DR. SIBU C CHITHRAN MBA. M.Phil, FDP (IIMK) PhD (Mgml), D.Lit Professor & Head. (Management Studies)

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

13

DEPARTMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE OF ENGINERRING 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.

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Project Guide

Head of the Department

Ms. RINTA GEORGE DR. SIBU C CHITHRAN MBA. M.Phil,FDP (IIMK) PhD (Mgmt), D.Litt Assistant Professor Department of Management Studigean of the Department Professor & Head. (Management Studies) Mangalam College of Engineering . Mangalam College of Engineering Ettumanoor, Kottayam - 686.631 vadu Ginita Ettumanoor, Kottayam the Alastaper Sells

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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 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

Ms. RINTA GEORGE Assistant Professor Department of Management Studies Mangalam College of Engineering Ettumanoor, Kottayam - 686 631



Prof. Dr. John T. Varughese

Dean of the Department

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PRINCIPAL Sibuce: Chithran

DR. SIBU C CHITHRAN MBA. M.Phil,FDP (IIMK) PhD (Mgmt), D.Litt Professor & Head. (Management Studies) Mangalam College of Engineering Ettumanoor, Kottayam

DEPARTMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE OF ENGINEERNIG, ETTUMANOOR KOTTAYAM



CERTIFICATE

This is to certify that the report titled A PROJECT REPORT ON EFFECTIVENESS OF ADVERTISMENTS 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.

lead of the Department Fagt SIBY JAMES MBA Associate Professor Dept of Management Studies Mangelam College of Engineering Ellumanoor, Kollayam - 686 631 ETTUMAN Dean of the Department Prof. (Dr) JOHN T. VARUGHESE Dean. Department of Management Studies Mangaldm College of Engineering Etiumanoor, Kottayam IANGALAM COLLEGE OF ENGINEERING

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 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, Etumanoor, Kottayam

Project guide Head of the Department ETTIMAN Ma. TINTA BABY Associate Professor Department of Management Studies, Mangalam Collega of Engineering. Ettumancar, Maila, am · NANGALAM COLLEGE OF ENGINEERING Dean of the Department Prof. (Dr) JOHN T. VARUGHESE Dean, Department of Management Studies Mangalam College of Engineering Ellumanoor, Kottayam

DEPARTMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE OF 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.

Head of the Department Faculty Guide Ms. RINTA GEORGE DR. SIEU C CHITHRAN MBA_M.Phil,FDP (IIMK) PhD (Mgmt), D.Litt Accistant Professor Professor & Head. (Management Studies) Department of Management Studies Dean of the Department Mangalam College of Engineering Mangalam Un ! of Engineering Ettumaneor, Kottayam - 686 631 Ettumanoor, Kottayam Prof. (Dr) JOHN T. VARUGHESE Dean. Department of Management Studies Mangalam College of Engineering Ettumanoor, Kottayam 1 ANGALAM COL

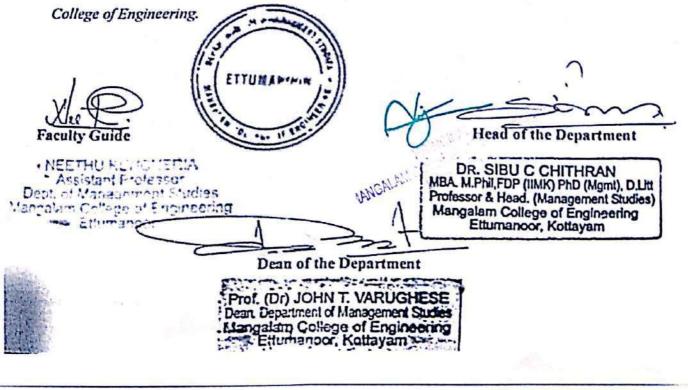
MANGALAM COLLEGE OF ENGINEERING



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



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.

Head of the Department DR. SIBU C CHITHRAN MBA. M.Phil, FDP (IIMK) PhD (Mgmt), D.Litt dipt Professor & Head. (Management Studies) 500 Mangalam College of Engineering Ettumanoor, Kottayam T.W. Sagally Dean of the Department IANGALAM.CO

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 Head of the department DR. SIBU C CHITHRAN MBA. M.Phil,FDP (IIMK) PhD (Mgnt), D.Litt MS . PINTA GEORGE Assistant Professor Professor & Head. (Management Studies) Department of Management Studies Mangalam College of Engineering Mangalam College of Engineering. Ettumanoor, Kottayam Etumanoor, Kottayam - 686 631 Dean of the Department Prof. (Dr) JOHN T. VARUGHESE Dean. Department of Management Studies Mangaldm College of Engineering Ettumanoor, Kottayam ANGALAM COU 111

DEPARTMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE OF ENGINEERING, KOTTYAM



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 ADMINISTRATON (MBA) of Abdul Kalam Technical University, Thriruvananthapuram under the guidance of Ms. JEENU MATHEW. Assistant Professor, Mangalam College of Engineering, Ettumanoor, Kottayam.

Head of the Department

Paculty Guide Ms. JEENU MATHEW Assistant Professor Department Of Management Studies Mangalain College Of Engineering Ettumanoor, Kottayam

DR. SIBU C CHITHRAN MBA. M.Phil, FDP (IIMK) PhD (Mgmil), D.Litt Professor & Head. (Management Studies) Mangalam College of Engineering Ettumanoor, Kottayam

Dean 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 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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Faculty Guide

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Head of the Department

DEPARTMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE OF ENGINEERING ETTUMANOOR, KOTTAYAM



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.

ofect Guide

Ms. JEENU MATHEW Assistant Professor Oppartment Of Management Studies Mangalam College Of Engineering

Ellumanoor, Kottayam Dean of the Department

Devin Department of Managerice, 1 Studios, 250 galan College of Eduction Ethomateria, Scattyrim

Head of the Department

DR. SIBU C CHITHRAN MBA. M.Phil, FDP (IIMK) PhD (Mgmt), D.Lta Professor & Head. (Management Studies) Mangalam College of Engineering Etiumanoor, Kottayam

CINEERING ANGALAM COLLEGE DOT

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 NIDIHN JOSE PJ (Reg. no: MLM19MBA62), as a part of theil 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, Eltunanoor, Kottayam.

Faculty Guide



Head of the Department

PRINCI ANIGALAM COLLEG

DR. SIBU C CHITHRAN MBA. M.Phil,FDP (IIMK) PhD (Mgmt), D.Litt Professor & Head. (Management Studies) Mangalam College of Engineering Ettumanoor, Kottayam

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

Dean of the Department

MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR KOTTAYAM



CERTIFICATE

This is to certify that the report titled "A study on Financial performance Analysis at Royal Enfield Itd" 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

ETTUM

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

Dean of the Department

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Head of the Department

DR. SIBU C CHITHRAN MBA. M.Phil,FDP (IIMK) PhD (Mgnt), D.Ltt Professor & Head. (Management Studies) Mangalam College of Engineering Ettumanoor, Kottayam

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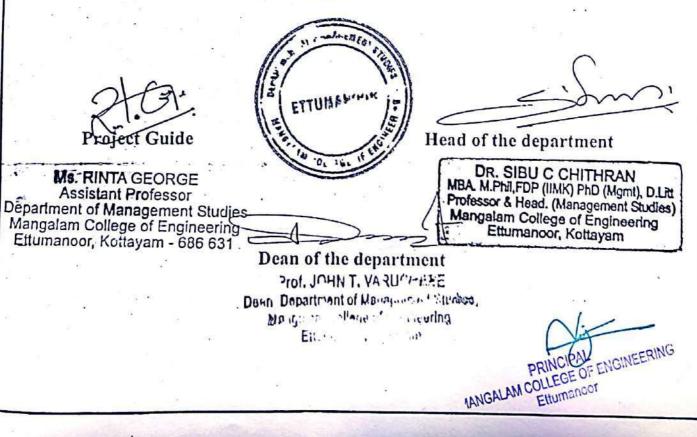
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MANGALAM COLLEGE OF ENGINEERING, KOTTAYAM



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.



MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR



CERTIFICATE

Data 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, MLM19MBA90 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, Enumerican

Head of The Department

DR. SIBU C CHITHRAN MBA M Phil/DP (IMK) Ph0 (Mgmt), D.Lit Professor & Head. (Management Studies) Mangatam College of Engineering Littemanpor, Kottayam

MANGALAM COL

OF ENDINEERING

Dean, Dept of Management studies

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Project Guide

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

2

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



CERTIFICATE

This is to certify that the report tuled "A STUDY ON FINANCIAL PERFORMANCE ANALYSIS AT FACT LIMITED, ELOOR" being submitted to RINTA GEORGEin partial fulfillment of the requirements for the award of the Degree of Masterof Business Administration, is abonafide record of the project work done by AMALUMOL MADHUOJ Department of Management Studies, Mangalam College of Engineering, Ettumanoor Kottayam.

Project Guide

Ms. RINTA GEORGE Astister Department

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Dean of the Department

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

VANGALAMO

Head of the Department

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DEPAERMENT OF MANAGEMENT STUDIES MÄNGALAM COLLEGE OF ENGINEERING, 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 VIJAY, (Reg. No: MLM19MBA27), as apart 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) Thiruvanathapuram

Facult Head of the Department JAMES NOA Protessor College of E noor, Koltayam Dean of the Department Dean, Department of Management Studies Mangalam College of Engineering Ettumanoor, Kottayam CINEERING IANGALAM COLLE Etiumanoor

MANGALAM COLLEGE OF ENGINEERNIG, ETTUMANOOR, KOTTAYAM



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

Faculty Guide

JITHIN JOHN Assistant Professor Dept. of Management Studies Mangalam College of Engineering-Ettumanoor

Head of the Department

DR. SIBU C CHITHRAN MBA. M.Phil,FDP (IIMK) PhD (Mgmt), D.Litt Professor & Head. (Management Studies) Mangalam College of Engineering Ettumanoor, Kottayam

NANGALAM

Dean of the Department

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

DEPARTMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR, 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

Head of the Department

DR. SIBU C CHITHRAN MBA. M.Phil,FDP (IIMK) PhD (Mgmt), D.Litt, Professor & Head. (Management Studies) Mangalami College of Engineering Ettumanoor, Kottayam

Dean of the Department

Ms. JEENU MATHEW Assistant Professor

Department Of Management Studies Mangalam College Of Engineering

Ettumanoor, Kottaram

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

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2

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 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.

Head of the Department Facul DR. SIBU C CHITHRAN MBA. M.Phil,FDP (IIMK) PhD (Mgmt), D.Litt Professor & Head. (Management Studies) Mangatam College of Engineering Dean of the Department Ettumanoor, Kottayam Prof. (Dr) JOHN T. VARUGHESE Dean. Department of Management Studies Mangalam College of Engineering Ettumanoor, Kottayam VANGALAM CO.

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



CERTIFICATE

This is to certify that this Project Report is a bonafide record of the work done by Mr. MUHAMMED ALFAS CS,MLM19MBA59as 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 ADMINISTRARTION of the Abdul Kalam Technological University (KTU), Thiruvanthapuram.

ProjectGuide

Head of theDepartment

DR. SIBU C CHITHRAN MBA. M.Phil,FDP (IIMK) PhD (Mgmt), D.Litt Professor & Head. (Management Studies) Mangalam College of Engineering Etiumanoor, Kottayam

Dean of the Department

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

DEPARTMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE OF ENGINEERNIG, ETTUMANOOR KOTTAYAM



CERTIFICATE ·

This is to certify that the report titled A STUDY ON FINANCIAL PERFOMANCE Of HINDUSTAN PETROLEUM CORPORATION Ltd. MUMBAI being submitted by Mi SHONE CHACKQ EAPEN. Reg No. MLM19MBA75, such Trunester student of this distribution of partial fulfilment of the requirements of the award Degree of Master of Bosiness 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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Head of the Department

PRINCIPAL OF CIUS

DR. SIBU C CHITHRAN MBA M PhilFDP (IMK) PhD (Mgmt), D.Litt Professor & Head. (Management Studies) Mangalam College of Engineering Ettumanoor, Kottayam

CERING

. Dean of the Department

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

DEPARTMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE OF ENGINEERNIG, ETTUMANOOR KOTTAYAM



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 honafide record of the project work done by Mr. THOMAS C ALPHONS of Department of Management Studies, Mangalam College of Engineering.

Eacuty Guide

Head of the Department

JITHIN JOHN Assistant Professor Dept. of Management Studies Mangalam College of Engineering Ettumanoor Dean of the Department (Prof. (Dr) JOHN T. VARUGHESEr Dean Department of Management Studies Mangalam College of Engineering Ettumanoor, Kottayam

ii

DEPARTMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE OF ENGINERRING ETTUMANOOR, KOTTAYAM



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.

Eaculty Guide Head of the Department DR. SIBU C CHITHRAN MBA. M.Phil, FDP (IIMK) PhD (Mgml), D.Litt Ms: RINTA GEORGE Dean of the Department Assistant Professor Professor & Head. (Management Studies) itment of Management Studies Mangalam College of Engineering St College of Chambering Ettumanoor, Kottayam Raises, raises Jam - 060 631 . Prof. (Dr) JOHN T. VARUGHESE Dean. Department of Management Studies Mangalam College of Engineering Ettumanoor, Kottayam WINGHAM CO.

DEPARTMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE OF ENGINERRING ETTUMANOOR, KOTTAYAM



CERTIFICATE

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.

Project Guide

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

DR. SIBU C CHITHRAN MBA. M.Phil,FDP (IIMK) PhD (Mgml), D.Litt Professor & Head. (Management Studies) Mangalam College of Engineering Ettumanoor, Kottayam

ADIGALAMCO.

Dean of the Department

Dean Department of Manajan and Studies, Mangklan Lottoge of Electronicing Ethomore A. Scatteran

DEPARTMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE OF ENGINEERING KOTTAYAM



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.

Faculty Guide Ms. JEENU MATHEW Assistant Professor Department Of Management Studies Mangaiam College Of Engineering Ettumanoor, Kottayam

Head of Department

DR. SIBU C CHITHRAN MBA. M.Phil,FDP (IIMK) PhD (Mgmt), D.Litt Professor & Head. (Management Studies) Mangalam College of Engineering Ettumanoor, Kottayam

Dean of department

Prof. JCHN T. VARUCHERKE Denn Department of Marchaele United Margaren Jolling auf Herke Earling Etheman Pd., Rastavale

PRINCIPAL PRINCIPAL MGALAM COLLEGE OF ELICITYEESING

DEPAERMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR



CERTIFICATE

This is to certify that "A STUDY ON THE EFFECTS OF BRAND ASSOCIATION OF AVT TEA AMOUNG HOMEMAKERS AT AVT NPL, ALUVA" being submitted by ABIJITH ASHOK MAGAR (MI_MI_9MBA03) 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 MANAGEMT STUDIES, MANGALAM COLLEGE OF ENGINEERING.

Faculty Guide

DR. SIBU C CHITHRAN MBA. M.Phil,FDP (IIMK) PhD (Mgmt), D.Litt Professor & Head. (Management Studies) Mangalam College of Engineering Ettumanoor, Kottayam

ref. (Dr) JOHN T. VARUGHESE an. Bepartment of Management Studies angalam College of Engineering Eliumanoor, Kottayam

Head of the Department

RING

DR. SIBU C CHITHRAN MBA. M.Phil,FDP (IIMK) PhD (Mgmt), D.Litt Professor & Head. (Management Studies) (Mangalam College of Engineering — Ettumanoor, Kottayam

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Dean of the Department

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



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

Head of the Department Faculty Guide MS. TINTA BABY Associate Protossor Ctudles. Department of Managam Mangalara Colla 1-Ettomanuor, Kolla Dean of the Department ----Prof. (Dr) JOHN T. VARUGHESE Dean. Department of Management Studies Mangalam College of Engineering ETTUMAN Ettumanoon, Kottayam GINEERING mancor IANGALAN C

DEPARTMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE OF ENGINEERING ETTUMANOOR, KOTTAYAM



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.

Head of the Department IES MEA viele Professor Dept.ol Ital agement Studies Vept. or Met.ayement orunes Mangalam College of Engineering Estumanoor, Kottayam - 686 631 Dean of the Department Prof. (Dr) JOHN T. VARUGHESE Dean. Department of Management Studies TTUM Mangaldm College of Engineering Ettumanoor, Kottayam WHIGHLAN

DEPARTMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE OF ENGINEERNIG, ETTUMANOOR KOTTAYAM



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 " MIMI9MI036, such Trimester student of this institution in partial fulfilment of the requirements of the award Degree of Master of Business Administration, is a bonefide record of the project work date by Ms, DEEPA DILEEP of Department of Management Studies, Mangalan College of Engineering.

DR. SIBU C CHITHRAN

Lessor & Head. (Management Studies) Mangalam College of Engineering

Etumanoor, Koltayam

Faculty Guide

Head of the Department

DR. SIEU C CHITHRAN MBA, M.Pt2-FDP (IMK) PtD (Mgmt), D Lit Professor & Head (Management Studies) Mangalam College of Engineering Ettumancor, Kottayam

Dean of the Department

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

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DEPARTMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE

OF ENGINEERING, ETTUMANOOR, KOTTAYAM



CERTIFICATE

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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Faculty Guide

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Head of the Department

DR. SIBU C CHITHRAN MBA. M.Phil,FDP (IIMK) PhD (Mgmt), D.Litt Professor & Head. (Management Studies) Dean of the Department Mangatam College of Engineering Ettúmanoor, Kottayam TRANSIENT, VA UNCHARE

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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 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.THASNYMOL Department of Management Studies Mangalam College of Engineering Ettumanoor.

ETTUMATION " Arth Head of the department Project Guide MR. THIYARASY DR. SIBU C CHITHRAN MBA. M.Phil, FDP (IIMK) PhD (Mgmt), D.Litt Attended Productor Bepärimori of 18 ch. ground studies. Professor & Head. (Management Studies) Mangalan College of Frequences Mangalam College of Engineering Principally principality Ettumanoor, Kottayam Dean of the Department PIGL JOHN T. VARIANCE Dean, Dapational of Lightwood 4 Mindest Ma colum Collegia Star Standing Titusta, ema, Seaterna: III

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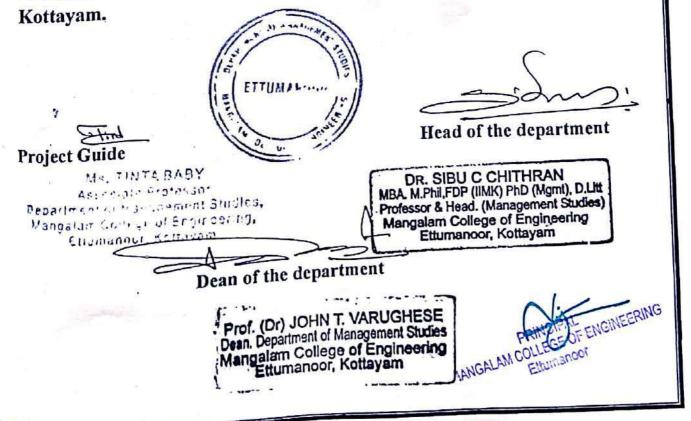
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MANGALAM COLLEGE OF ENGINEERING, KOTTAYAM



CERTIFICATE

This is to certify that the Project Report is a bonafide record of the work done by 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 BAHY, Associate Professor, Mangalam College of Engineering, Ettumanoor,



MANGALAM COLLEGE OF ENGINEERING, KOTTAYAM



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.

Mrs.Rinta George Assistant Professor Faculty Guide

Ms. RINTA GEORGE Assistant Professor Department of Management Studies infam College of Engineering

TTUHS

Dr. Sibu C. Chitran Head of the Department

DR. SIBU C CHITHRAN MBA M.PhilFDP (IIMR) PhD (Mgml), DLIE Professor & Head. (Management Studies) Mangalam College of Engineering Ethumencor, Kottayam

Prof. Dr.John T. Varughese Dean of the Department

Prof. JOHN T. VARUF MELT Dean Department of Management - Thirdee, Bungeran, Lolleye J'1 Holiverine Ethomas H, Sasteran

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



CERTIFICATE

This is to certify that the report titled "A STUDY TO UNDERSTAND THE EFFECTIVENESS OF ADVERTISEMENTS OF INDIGO PAINTS AMOUNG 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

Faculty Guide

JITHIN JOHN Assistant Professor Dept. of Management Studies Mangalam College of Engineering Eltumanoor

Head of the Department

DR. SIBU C CHITHRAN MBA. M.Phil,FDP (IIMK) PhD (Mgml), D.Litt Professor & Head. (Management Studies) Mangalam College of Engineering Ettumianoor, Kottayam

Dean of the Department

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



CERTIFICATE

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.

Head of the Department **Faculty** Guide DR. SIBU C CHITHRAN MBA M.Pha, FDP (IMK) PhD (Mgri), D.LM MS NEETHU KUNCHERIA ASSISTANT PROFESSOR Professor & Head. (Management Studies) langalam College of Engineering Ettumanoor, Kottayam · NEETHU KUNCHERIA Dean of The Department Assistant Frolessor Dept. of Management Studies Mangalam College of Engineering Prof. JOHN T. VARUPASE Dean Department of Management Shat Mangalan College of Emprosting FRING LANGALA

DEPARTMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR.



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.

ETTUMAN Head of the Department Faculty Guide JITHIN JOHN DR. SIBU C CHITHRAN .. Assistant Professor MBA. M.Phil,FDP (IIMK) PhD (Mgmt), D.Litt Dept. of Management Studies Professor & Head. (Management Studies) langalam College of Engineering Mangalam College of Engineering Ettumanoor Ettumanoor, Kottayam Dean of the Department PTOI. JOHN T. YA RUPHTE ERING Dawn Department of Navaura + Street ANGALAM COLL Fhuma Ettimonoor

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.

Head of the department Project Guide Dean of the department of. (Dr) JOHN T. Dean. Department of Management Mangalam College of Engineering Ettumanoor, Kottavam ncot

MANGALAM COLLEGE OF ENGINEERING, KOTTAYAM



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.

Faculty Guide

Ms. RINTA GEORGE

Assistant 6 clossor Department of Man- junctof Studies

Mangalam College of Ecologiering

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Head of the Department

DR. SIBU C CHITHRAN MBA. M.Phil,FDP (IIMK) PhD (Mgmt), D.Litt Professor & Head. (Management Studies) Mangalam College of Engineering Ettumapoor, Kottayam

Ettumanoor, Kottayam - 686-631 Dean of the Department Prof. JOHN T. VA RUC-FYE Dean Department of Managurary 4 Sturbos, Managatan Lolleys of Schulenning Ethume.e.s., Surfaram

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DEPAERMENT OF MANAGEMENT STUDIESMANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR



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 bonalide of the work done by SWATHV 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 API Abdul Kalam Technological University (KTU) Thiruvananthapuram.

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Project Guide

DR. SIBU C CHITHRAN MBA. M.Phil,FDP (IIMK) PhD (Mgml), D.Lit Professor & Head. (Management Studies) Mangelam College of Engineering Etturnericor, Koltayam

Head of Department

DR. SIBU C CHITHRAN MBA. M.Phil,FDP (IIMK) PhD (Mgml), D.Litt Professor & Head. (Management Studies) Mingalam College of Engineering Etiumanoor, Kollayam

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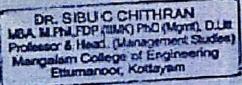


CERTIFICATE

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 ABHILITH SATHEESAN (MLM19MBA01) as a part of the Project work during the sixth trimesterin partial fulfilment of the regularements of the degree of MASTER OF BUSINESS ADMINISTRATION of A.P.J. Abdul Kalam Technological University (KTU), Elisticananthapuram.

Project Guide

Head of the department



Dean of the department

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

DEPARTMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE OF ENGINEERING, KOTTYAM



CERTIFICATE

Pass is to dentity that this Project Report is a langafield record of the work done by Mr. ANANDHANRININAN J (Reg. No: MI MI9MBAD) as a part of the Project work during the Sixth numerics at RELIANCE JIO is partial fulfilement of the responsements for the award of the degree of MASTER OF BUSINESS ADMINISTRATON (MIRA) of Abdul Kafara Technical University Therevananthappranticular the guidance of Dr. SHIY JAMES Associate Postcorre-Mangalaar College of Engineering, Ethinianoor, Kentayaan

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Dean of the Department

T VARUGHESE Prol (Dr) Jr and Studies Chan Derth Empineering Manga TTL VILLE

Head of the Department

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DEPARTMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE OF ENGINEERING ETTUMANOOR, KOTTVAM



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 NOrMEMINIPMBA28) as a part of the project work done during the sorth semesiter in partial fulfilment of the requirement for the awaid of the degree of MASTER OF BUSINESS ADMINISTRATION(MBA) is a bonsfied report of project work done by Department of Managamani Studies, Mangalam College of Engineering, Emimanoor

Dean of the Department

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

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Head of the Department

APNG

DEPARTMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE OF ENGINEERING ETTUMANOOR, KOTTAYAM



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.

MANGP

Head of the department

NUME

Project Guide MS. TINTA BABY DR. SIBU C CHITHRAN MBA. M.Phil,FDP (IIMK) PhD (Mgmt), D.Litt Associate Professor opartment of transperient Studios. Professor & Head. (Management Studies) Mangalam College of Engineering Manyalam College of Engineering Ettumanoor, Kottayam Ellumanosi, Koltayan Dean of the Department Prof. (Dr) JOHN T. VARUGHESE Dean. Department of Management Studies Mangalam College of Engineering Ettumanoor, Kottayam

III.

DEPARTMENT OF MANAGEMENT STUDIES, MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR



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.

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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DEPARTMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE OF ENGINEERING, KOTTAYAM



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 JOSPEH, Department of Management studies, Mangalam college of engineering, Kottayam.

Project guide

BOSE TOM Associate Professor Department of Management Studies Mangalam College of Engineerirg Ettumanoof; Kottayam



Head of department

DR. SIBU C CHITHRAN MBA M.Fh2FDP (IMRO PhD (Mgmt), D.Ltr. Professor & Head. (Managament Staties), Mangalam College of Engineering Ethumanoor, Kottayam

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

Dean of 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 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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Project Guide

Benartment of Centres Dean of the Department Environment Environment

Head of the Department

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DR. SIBU C CHITHRAN MBA. M.Phil,FDP (IIMK) PhD (Mgml), D.Lit Professor & Head. (Management Studies Mangalam College of Engineering Ettumanoor, Kottayam

DEPARTMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE OF ENGINERRING ETTUMANOOR, KOTTAYAM



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.

1 15 53 **Project Guide** Head of the Department MS. TINTA BABY Associate Professo DR. SIBU C CHITHRAN Department of Manageme Mangalam College of Engl Professor & Head. (Management Studies) Ellumanoor, Kottaya Dean of the Department Mangalam College of Engineering Ettumanoor, Kottayam Prof. (Dr) JOHN T. VARUGHESE Dean. Department of Management Studies Mangalam College of Engineering Ettumanoor, Kottayam 4 Man reading IANGALAM -

DEPAERMENT OF MANAGEMENT STUDIES MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR



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 IVPE, (Reg. No: MLMI9MBA78), as a part of the project work during the sixth transster in partial fulfilment of the requirements of the degree of MASTER OF BUSINESS ADMINISTRATION of APJ Abdul Kalam Technological University (KTU), Thuruyananthapuram.

flead of the Department

Sign (AMES, NEA Associate Professor Dept of Management Studies Mangularin Cullege of Engineering Mangularin Cullege of Engineering Envinement, Kottayam - 686 631

Dean of the Department

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

MANGALAM COLLEGE OF ENGINEERING, ETTUMANOOR KOTTAYAM



CERTIFICATE

This is to certify that this project Report is a bonafide record of the work done by THASNI S (Reg. no: MLM19MBA84), 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.

ETTUNAWTIN 1F (Project Guide) (Head of the Department) DR. SIEU C CUTTURAN DR. SIBU C CHITHRAN 1 D.LHt MBA. M.Phil, FDP (IIMA) : -MBA. M.Phil, FDP (IIMK) PhD (Mgmt), D.Lk Professor & Head. (Management Studies) Professor & Head. (Management Studies) Mangalam College of Engineering, Mangalam College of Engineering Ettumanoor, Kottayam Ettumanoor, Kottayam an of the Depart Prof. (Dr) JOHN T. VARUGHESE Dean' Department of Management Studies Mangalam College of Engineering Ettumanoor, Kottayam ANGHI