KERALA TECHNOLOGICAL UNIVERSITY

Curriculum for
Semesters I and II

2015

SEMESTER I

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

Notes:

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

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

   Civil Engineering

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

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

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

   Electrical & Electronics Engineering, Electrical Engineering

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

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

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

   Computer Engineering, Computer Science & Engineering, Information Technology.

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

   Biotechnology, Biotechnology & Biochemical Engineering, Chemical Engineering.

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

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

For example, students opting *Introduction to <u>Civil </u>Engineering* or Basics of Civil Engineering should attend the *Civil Engineering Workshop*, students opting *Introduction to <u>Mechanical Engineering</u>* 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>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.

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.

SEMESTER II

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

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

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Curriculum

for

B.Tech Degree

Semesters III to VIII

2016

Civil Engineering

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

CET CAMPUS, THIRUVANANTHAPURAM – 695016

KERALA, INDIA

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

BRANCH: *Civil Engineering*

SEMESTER - 3

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

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

SEMESTER - 4

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

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

BRANCH:*Civil Engineering*

SEMESTER - 5

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

Total Credits = 23   Hours: 28   Cumulative Credits= 117

Elective 1:- 1. CE361   Advanced Concrete Technology

2. CE363   Geotechnical Investigation

3. CE365   Functional Design of Buildings

4. CE367   Water Conveyance Systems

5. CE369   Disaster Management

6. CE371   Environment and Pollution

7. CE 373   Advanced Mechanics of Materials

3

BRANCH: *Civil Engineering*

SEMESTER - 6

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

Total Credits = 23   **Hours:27**   **Cumulative Credits= 140**

Elective 2:-

1. CE362   Ground Improvement Techniques

2. CE364   Advanced Foundation Engineering

3. CE366   Traffic Engineering and Management

4. CE368   Prestressed Concrete

5. CE372   Engineering Hydrology

6. CE374   Air Quality Management

BRANCH: *Civil Engineering*

SEMESTER - 7

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

Total Credits = 22   **Hours: 27**   **Cumulative Credits= 162**

Elective 3:-

1. CE461   Wave Hydrodynamics and Coastal Engineering

2. CE463   Bridge Engineering

3. CE465   Geo-Environmental Engineering

4. CE467   Highway Pavement Design

5. CE469   Environmental Impact Assessment

6. CE471   Advanced Structural Design

7. CE473   Advanced Computational Techniques and Optimization

BRANCH: *Civil Engineering*

SEMESTER - 8

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

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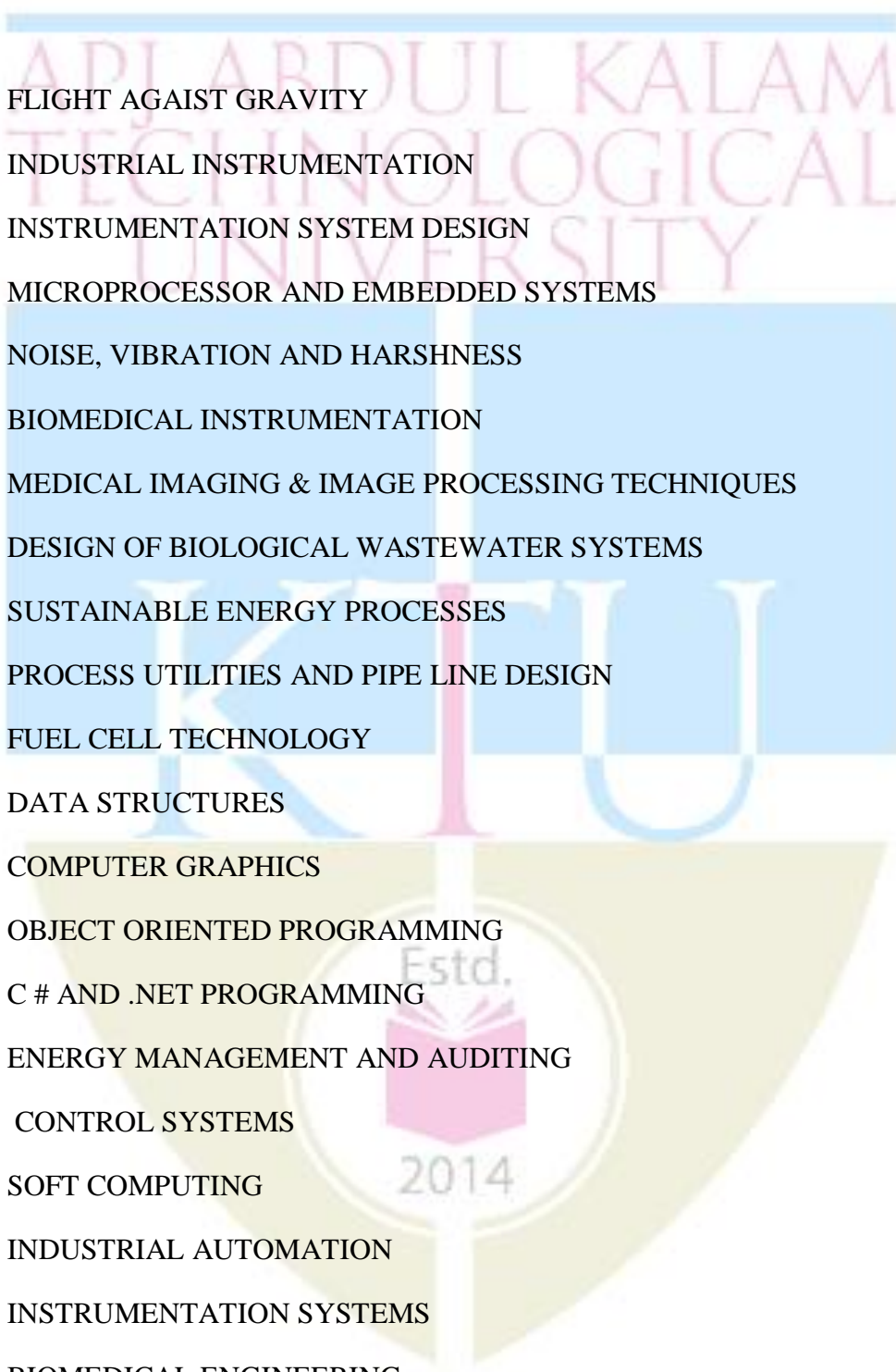
Elective 4:-

1. CE462   Town and Country Planning

2. CE464   Reinforced Soil Structures and Geosynthetics

3. CE466   Finite Element Methods

4. CE468   Structural Dynamics and Earthquake Resistant Design

5. CE472   Transportation Planning

6. CE474   Municipal Solid Waste Management

ELECTIVE 5 (NON DEPARTMENTAL ELECTIVE COURSES)

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

1. AO482   FLIGHT AGAIST GRAVITY

2. AE482   INDUSTRIAL INSTRUMENTATION

3. AE484   INSTRUMENTATION SYSTEM DESIGN

4. AU484   MICROPROCESSOR AND EMBEDDED SYSTEMS

5. AU486   NOISE, VIBRATION AND HARSHNESS

6. BM482   BIOMEDICAL INSTRUMENTATION

7. BM484   MEDICAL IMAGING & IMAGE PROCESSING TECHNIQUES

8. BT461   DESIGN OF BIOLOGICAL WASTEWATER SYSTEMS

9. BT362   SUSTAINABLE ENERGY PROCESSES

10. CH482   PROCESS UTILITIES AND PIPE LINE DESIGN

11. CH484   FUEL CELL TECHNOLOGY

12. CS482   DATA STRUCTURES

13. CS484   COMPUTER GRAPHICS

14. CS486   OBJECT ORIENTED PROGRAMMING

15. CS488   C # AND .NET PROGRAMMING

16. EE482   ENERGY MANAGEMENT AND AUDITING

17. EE484   CONTROL SYSTEMS

18. EE486   SOFT COMPUTING

19. EE488   INDUSTRIAL AUTOMATION

20. EE494   INSTRUMENTATION SYSTEMS

21. EC482   BIOMEDICAL ENGINEERING

22. FT482   FOOD PROCESS ENGINEERING

23. FT484   FOOD STORAGE ENGINEERING

24. FT486   FOOD ADDITIVES AND FLAVOURING

25.IE482   FINANCIAL MANAGEMENT

26. IE484   INTRODUCTION TO BUSINESS ANALYTICS

27.IE486   DESIGN AND ANALYSIS OF EXPERIMENTS

28. IE488   TOTAL QUALITY MANAGEMENT

29.IC482   BIOMEDICAL SIGNAL PROCESSING

30. IT482   INFORMATION STORAGE MANAGEMENT

31. MA482   APPLIED LINEAR ALGEBRA

32. MA484   OPERATIONS RESEARCH

33. MA486   ADVANCED NUMERICAL COMPUTATIONS

34. MA488   CRYPTOGRAPHY

35.ME484   FINITE ELEMENT ANALYSIS (CE 466 FINITE ELEMENT METHODS)

36.ME482   ENERGY CONSERVATION AND MANAGEMENT

37.ME471   OPTIMIZATION TECHNIQUES (CE 473 ADVANCED COMPUTATIONAL TECHNIQUES AND OPTIMISATION)

38.MP482   PRODUCT DEVELOPMENT AND DESIGN

39. MP469   INDUSTRIAL PSYCHOLOGY & ORGANIZATIONAL BEHAVIOUR

40. MT482   INDUSTRIAL SAFETY

41. MR482   MECHATRONICS

42. FS482   RESPONSIBLE ENGINEERING

43. SB482   DREDGERS AND HARBOUR CRAFTS

44. HS482   PROFESSIONAL ETHICS

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Curriculum

for

B.Tech Degree

Semesters III to VIII

2016

Computer Science and Engineering

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

CET CAMPUS, THIRUVANANTHAPURAM – 695016

KERALA, INDIA

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

BRANCH: *Computer Science & Engineering*

SEMESTER - 3

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

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

SEMESTER - 4

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

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

BRANCH: *Computer Science & Engineering*

SEMESTER - 5

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

Total Credits = 23   **Hours: 29   Cumulative Credits= 117**

Elective 1:-   1. CS361   Soft Computing

2. CS363   Signals and Systems

3. CS365   Optimization Techniques

4. CS367   Logic for Computer Science

5. CS369   Digital System Testing & Testable Design

3

BRANCH: *Computer Science & Engineering*

SEMESTER - 6

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

Total Credits = 23   **Hours: 27**   **Cumulative Credits= 140**

Elective 2:-

1. CS362   Computer Vision

2. CS364   Mobile Computing

3. CS366   Natural Language Processing

4. CS368   Web Technologies

5. CS372   High Performance Computing

4

BRANCH: *Computer Science & Engineering*

SEMESTER - 7

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

Total Credits = 22 **Hours: 27** **Cumulative Credits= 162**

Elective 3:-

1. CS461   Computational Geometry

2. CS463   Digital Image Processing

3. CS465   Bio Informatics

4. CS467   Machine Learning

5. CS469   Computational complexity

BRANCH: *Computer Science & Engineering*

SEMESTER - 8

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

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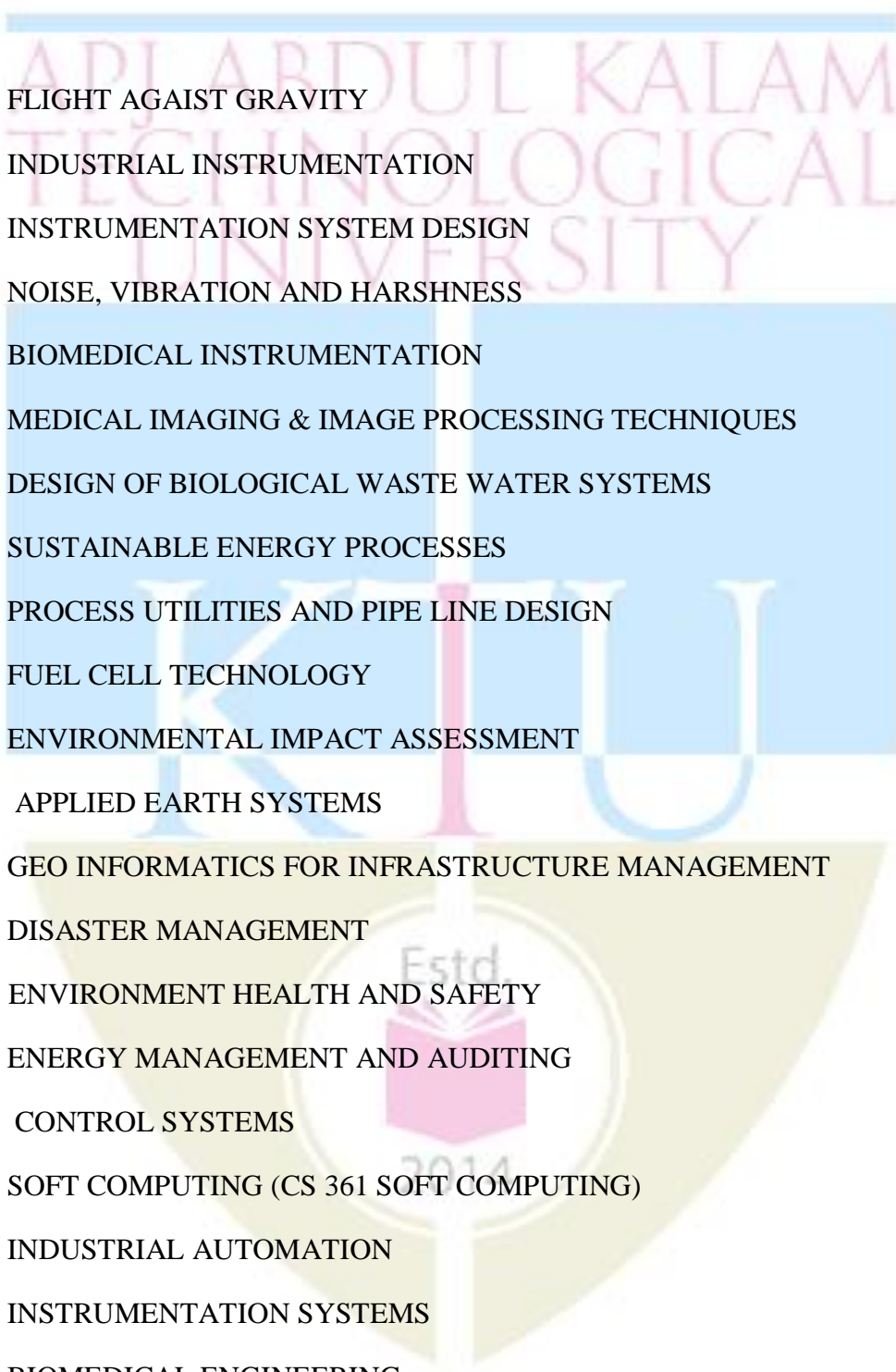
Elective 4:-

    1. CS462   Fuzzy Set Theory and Applications

    2. CS464   Artificial Intelligence

    3. CS466   Data Science

    4. CS468   Cloud Computing

    5. CS472   Principles of Information Security

ELECTIVE 5 (NON DEPARTMENTAL ELECTIVE COURSES)

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

1. AO482   FLIGHT AGAIST GRAVITY

2. AE482   INDUSTRIAL INSTRUMENTATION

3. AE484   INSTRUMENTATION SYSTEM DESIGN

4. AU486   NOISE, VIBRATION AND HARSHNESS

5. BM482   BIOMEDICAL INSTRUMENTATION

6. BM484   MEDICAL IMAGING & IMAGE PROCESSING TECHNIQUES

7. BT461   DESIGN OF BIOLOGICAL WASTE WATER SYSTEMS

8. BT362   SUSTAINABLE ENERGY PROCESSES

9. CH482   PROCESS UTILITIES AND PIPE LINE DESIGN

10. CH484   FUEL CELL TECHNOLOGY

11. CE482   ENVIRONMENTAL IMPACT ASSESSMENT

12. CE484   APPLIED EARTH SYSTEMS

13. CE486   GEO INFORMATICS FOR INFRASTRUCTURE MANAGEMENT

14. CE488   DISASTER MANAGEMENT

15. CE494   ENVIRONMENT HEALTH AND SAFETY

16. EE482   ENERGY MANAGEMENT AND AUDITING

17. EE484   CONTROL SYSTEMS

18. EE486   SOFT COMPUTING (CS 361 SOFT COMPUTING)

19. EE488   INDUSTRIAL AUTOMATION

20. EE494   INSTRUMENTATION SYSTEMS

21. EC482   BIOMEDICAL ENGINEERING

22. FT482   FOOD PROCESS ENGINEERING

23. FT484   FOOD STORAGE ENGINEERING

24. FT486   FOOD ADDITIVES AND FLAVOURING

25. IE482   FINANCIAL MANAGEMENT

26. IE484   INTRODUCTION TO BUSINESS ANALYTICS

27. IE486   DESIGN AND ANALYSIS OF EXPERIMENTS

28. IE488   TOTAL QUALITY MANAGEMENT

29. IC482   BIOMEDICAL SIGNAL PROCESSING

30. IT482   INFORMATION STORAGE MANAGEMENT

31. MA482   APPLIED LINEAR ALGEBRA

32. MA484   OPERATIONS RESEARCH (CS 365 OPTIMISATION TECHNIQUES)

33. MA486   ADVANCED NUMERICAL COMPUTATIONS

34. ME484   FINITE ELEMENT ANALYSIS

35. ME482   ENERGY CONSERVATION AND MANAGEMENT

36. ME471   OPTIMIZATION TECHNIQUES (CS 365 OPTIMISATION TECHNIQUES)

37. MP482   PRODUCT DEVELOPMENT AND DESIGN

38. MP469   INDUSTRIAL PSYCHOLOGY & ORGANIZATIONAL BEHAVIOUR

39. MT482   INDUSTRIAL SAFETY

40. MR482   MECHATRONICS

41. FS482   RESPONSIBLE ENGINEERING

42. SB482   DREDGERS AND HARBOUR CRAFTS

43. HS482   PROFESSIONAL ETHICS

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Curriculum

for

B.Tech Degree

Semesters III to VIII

2016

Electronics and Communication Engineering

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

CET CAMPUS, THIRUVANANTHAPURAM – 695016

KERALA, INDIA

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

BRANCH:*Electronics & Communication Engineering*

SEMESTER - 3

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

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

SEMESTER - 4

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

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

BRANCH:*Electronics & Communication Engineering*

SEMESTER - 5

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

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

Elective 1:- 1. EC361   Digital System Design

2. EC363   Optimization Techniques

3. EC365   Biomedical Engineering

4. EC360   Soft Computing

BRANCH:*Electronics & Communication Engineering*

SEMESTER - 6

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

Total Credits = 23   **Hours: 27**   **Cumulative Credits= 140**

Elective 2:-

 1. EC362   Modelling & Simulation of Communication Systems

 2. EC366   Real Time Operating Systems

 3. EC368   Robotics

 4. EC370   Digital Image Processing

BRANCH:*Electronics & Communication Engineering*

SEMESTER - 7

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

Total Credits = 22   Hours: 27   Cumulative Credits= 162

Elective 3:-

    1. EC461   Microwave Devices and Circuits

    2. EC463   Speech and Audio Signal Processing

    3. EC465   MEMS

    4. EC467   Pattern Recognition

    5. EC469   Opto Electronic Devices

BRANCH:*Electronics & Communication Engineering*

SEMESTER - 8

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

Total Credits = 18   Hours: 29   Cumulative Credits= 180

Elective 4:-

    1. EC462   Mixed Signal Circuit Design

    2. EC464   Low Power VLSI Design

    3. EC466   Cyber Security

    4. EC468   Secure Communication

    5. EC472   Integrated Optics & Photonic Systems

    6.EC474   Computer Vision

ELECTIVE 5 (NON DEPARTMENTAL ELECTIVE COURSES)

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

1. AO482   FLIGHT AGAIST GRAVITY

2. AE482   INDUSTRIAL INSTRUMENTATION

3. AE484   INSTRUMENTATION SYSTEM DESIGN

4. AU486   NOISE, VIBRATION AND HARSHNESS

5. BM482   BIOMEDICAL INSTRUMENTATION

6. BM484   MEDICAL IMAGING & IMAGE PROCESSING TECHNIQUES

7. BT461   DESIGN OF BIOLOGICAL WASTEWATER SYSTEMS

8. BT362   SUSTAINABLE ENERGY PROCESSES

9. CH482   PROCESS UTILITIES AND PIPE LINE DESIGN

10. CH484   FUEL CELL TECHNOLOGY

11. CE482   ENVIRONMENTAL IMPACT ASSESSMENT

12. CE484   APPLIED EARTH SYSTEMS

13. CE486   GEO INFORMATICS FOR INFRASTRUCTURE MANAGEMENT

14. CE488   DISASTER MANAGEMENT

15. CE494   ENVIRONMENT HEALTH AND SAFETY

16. CS482   DATA STRUCTURES

17. CS484   COMPUTER GRAPHICS

18. CS488   C # AND .NET PROGRAMMING

19. EE482   ENERGY MANAGEMENT AND AUDITING

20. EE486   SOFT COMPUTING (EC 360 SOFT COMPUTING)

21. EE488   INDUSTRIAL AUTOMATION

22. EE494   INSTRUMENTATION SYSTEMS

23. FT482   FOOD PROCESS ENGINEERING

24. FT484   FOOD STORAGE ENGINEERING

25. FT486   FOOD ADDITIVES AND FLAVOURING

26. IE482   FINANCIAL MANAGEMENT

27. IE484   INTRODUCTION TO BUSINESS ANALYTICS

28. IE486   DESIGN AND ANALYSIS OF EXPERIMENTS

29. IE488   TOTAL QUALITY MANAGEMENT

30. IC482   BIOMEDICAL SIGNAL PROCESSING

31. IT482   INFORMATION STORAGE MANAGEMENT

32. MA482   APPLIED LINEAR ALGEBRA

33. MA484   OPERATIONS RESEARCH (EC 363 OPTIMISATION TECHNIQUES)

34. MA486   ADVANCED NUMERICAL COMPUTATIONS

35. MA488   CRYPTOGRAPHY

36. ME484   FINITE ELEMENT ANALYSIS

37. ME482   ENERGY CONSERVATION AND MANAGEMENT

38. ME471   OPTIMIZATION TECHNIQUES (EC 363 OPTIMISATION TECHNIQUES)

39. MP482   PRODUCT DEVELOPMENT AND DESIGN

40. MP469   INDUSTRIAL PSYCHOLOGY & ORGANIZATIONAL BEHAVIOUR

41. MP484   PROJECT MANAGEMENT

42. MT482   INDUSTRIAL SAFETY

43. MR482   MECHATRONICS

44. FS482   RESPONSIBLE ENGINEERING

45. SB482   DREDGERS AND HARBOUR CRAFTS

46. HS482   PROFESSIONAL ETHICS

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Curriculum

for

B.Tech Degree

Semesters III to VIII

2016

Electrical and Electronics Engineering

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

CET CAMPUS, THIRUVANANTHAPURAM – 695016

KERALA, INDIA

Phone +91 471 2598122, 2598422

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

Email: university@ktu.edu.in

BRANCH: *Electrical & Electronics Engineering*

SEMESTER - 3

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

Total Credits = 24   Hours: 28/29   Cumulative Credits= 71

SEMESTER - 4

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

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

BRANCH:*Electrical & Electronics Engineering*

SEMESTER - 5

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

Total Credits = 23   Hours: 28   Cumulative Credits= 117

Elective 1:-   1. EE361   Object Oriented Programming

2. EE363   Computer Organization and Architecture

3. EE365   Digital System Design

4. EE367   New and Renewable Energy Systems

5.EE369   High Voltage Engineering

BRANCH: *Electrical & Electronics Engineering*

SEMESTER - 6

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

Total Credits = 23   Hours: 27   Cumulative Credits= 140

Elective 2:-

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

BRANCH:*Electrical & Electronics Engineering*

SEMESTER - 7

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

Total Credits = 22   Hours: 27Cumulative Credits= 162

Elective 3:-

    1. EE461   Modern Operating Systems

    2. EE463   Computer Aided Power Systems Analysis

    3. EE465   Power Quality

    4. EE467   Nonlinear Control Systems

    5.EE469   Electric and Hybrid Vehicles

BRANCH: *Electrical & Electronics Engineering*

SEMESTER - 8

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

Total Credits = 18   Hours: 29   Cumulative Credits= 180

Elective 4:-

1. EE462   Design of Digital Control Systems

2. EE464   FACTS

3. EE466   Digital Image Processing

4. EE468   Computer Networks

5. EE472   Internet of Things

6. EE474   Energy Management and Auditing

ELECTIVE 5 (NON DEPARTMENTAL ELECTIVE COURSES)

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

1. AO482   FLIGHT AGAIST GRAVITY

2. AE484   INSTRUMENTATION SYSTEM DESIGN

3. AU486   NOISE, VIBRATION AND HARSHNESS

4. BM482   BIOMEDICAL INSTRUMENTATION(EE 372 BIOMEDICAL INSTRUMENTATION)

5. BM484   MEDICAL IMAGING & IMAGE PROCESSING TECHNIQUES

6. BT461   DESIGN OF BIOLOGICAL WASTEWATER SYSTEMS

7. BT362   SUSTAINABLE ENERGY PROCESSES

8. CH482   PROCESS UTILITIES AND PIPE LINE DESIGN

9. CH484   FUEL CELL TECHNOLOGY

10. CE482   ENVIRONMENTAL IMPACT ASSESSMENT

11. CE484   APPLIED EARTH SYSTEMS

12. CE486   GEO INFORMATICS FOR INFRASTRUCTURE MANAGEMENT

13. CE488   DISASTER MANAGEMENT

14. CE494   ENVIRONMENT HEALTH AND SAFETY

15. CS482   DATA STRUCTURES (EE 362 DATA STRUCTURES AND ALGORITHMS)

16. CS484   COMPUTER GRAPHICS

17. CS486   OBJECT ORIENTED PROGRAMMING (EE 361OBJECT ORIENTED PROGRAMMING)

18. CS488   C # AND .NET PROGRAMMING

19. EC482   BIOMEDICAL ENGINEERING

20. FT482   FOOD PROCESS ENGINEERING

21. FT484   FOOD STORAGE ENGINEERING

22. FT486   FOOD ADDITIVES AND FLAVOURING

23. IE482   FINANCIAL MANAGEMENT

24. IE484   INTRODUCTION TO BUSINESS ANALYTICS

25. IE486   DESIGN AND ANALYSIS OF EXPERIMENTS

26. IE488   TOTAL QUALITY MANAGEMENT

27. IC482   BIOMEDICAL SIGNAL PROCESSING

28. IT482   INFORMATION STORAGE MANAGEMENT

29. MA482   APPLIED LINEAR ALGEBRA

30. MA484   OPERATIONS RESEARCH

31. MA486   ADVANCED NUMERICAL COMPUTATIONS

32. MA488   CRYPTOGRAPHY

33. ME484   FINITE ELEMENT ANALYSIS

34. ME482   ENERGY CONSERVATION AND MANAGEMENT (EE474 ENERGY MANAGEMENT AND AUDITING)

35. ME471   OPTIMIZATION TECHNIQUES

36. MP482   PRODUCT DEVELOPMENT AND DESIGN

37. MP469   INDUSTRIAL PSYCHOLOGY & ORGANIZATIONAL BEHAVIOUR

38. MP484   PROJECT MANAGEMENT

39. MT482   INDUSTRIAL SAFETY

40. MR482   MECHATRONICS

41. FS482   RESPONSIBLE ENGINEERING

42. SB482   DREDGERS AND HARBOUR CRAFTS

43. HS482   PROFESSIONAL ETHICS

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Curriculum

for

B.Tech Degree

Semesters III to VIII

2016

Mechanical Engineering

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

CET CAMPUS, THIRUVANANTHAPURAM – 695016

KERALA, INDIA

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

BRANCH: *Mechanical Engineering*

SEMESTER - 3

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

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

SEMESTER - 4

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

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

BRANCH: *Mechanical Engineering*

SEMESTER - 5

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

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

Elective 1:-   1. ME361   Advanced Fluid Mechanics

2. ME363   Composite Materials and Mechanics

3. ME365   Advanced Metal Casting

4. ME367   Non-Destructive Testing

5. ME369   Tribology

6. ME371   Nuclear Engineering

7. ME373   Human Relations Management

BRANCH:*Mechanical Engineering*

SEMESTER - 6

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

Total Credits = 23   **Hours: 27**   **Cumulative Credits= 140**

Elective 2:-

1. ME362   Control System Engineering

2. ME364   Turbo Machinery

3. ME366   Advanced Metal Joining Technology

4. ME368   Marketing Management

5. ME372   Operations Research

6. ME374   Theory of Vibration

7. ME376   Maintenance Engineering

BRANCH:*Mechanical Engineering*

SEMESTER - 7

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

Total Credits = 22   **Hours: 27**   **Cumulative Credits= 162**

Elective 3:-

1. ME461   Aerospace Engineering

2. ME463   Automobile Engineering

3. ME465   Industrial Hydraulics

4. IE306   Supply Chain and Logistics Management

5. ME467   Cryogenic Engineering

6. ME469   Finite Element Analysis

7. ME471   Optimization Techniques

BRANCH:*Mechanical Engineering*

SEMESTER - 8

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

Total Credits = 18   **Hours: 30**   **Cumulative Credits= 180**

Elective 4:-

    1. ME462   Propulsion Engineering

    2. ME464   Robotics and Automation

    3. ME466   Computational Fluid Dynamics

    4. ME468   Nanotechnology

    5. ME472   Failure Analysis and Design

    6. ME474   Micro and Nano Manufacturing

    7. ME476   Material Handling & Facilities Planning

ELECTIVE 5 (NON DEPARTMENTAL ELECTIVE COURSES)

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

1. AO482   FLIGHT AGAIST GRAVITY

2. AE482   INDUSTRIAL INSTRUMENTATION

3. AE484   INSTRUMENTATION SYSTEM DESIGN

4. AU484   MICROPROCESSOR AND EMBEDDED SYSTEMS

5. AU486   NOISE, VIBRATION AND HARSHNESS

6. BM482   BIOMEDICAL INSTRUMENTATION

7. BM484   MEDICAL IMAGING & IMAGE PROCESSING TECHNIQUES

8. BT461   DESIGN OF BIOLOGICAL WASTEWATER SYSTEMS

9. BT362   SUSTAINABLE ENERGY PROCESSES

10. CH482   PROCESS UTILITIES AND PIPE LINE DESIGN

11. CH484   FUEL CELL TECHNOLOGY

12. CE482   ENVIRONMENTAL IMPACT ASSESSMENT

13. CE484   APPLIED EARTH SYSTEMS

14. CE486   GEO INFORMATICS FOR INFRASTRUCTURE MANAGEMENT

15. CE488   DISASTER MANAGEMENT

16. CE494   ENVIRONMENT HEALTH AND SAFETY

17. CS482   DATA STRUCTURES

18. CS484   COMPUTER GRAPHICS

19. CS486   OBJECT ORIENTED PROGRAMMING

20. CS488   C # AND .NET PROGRAMMING

21. EE484   CONTROL SYSTEMS (ME 362/ CONTROL SYSTEM ENGINEERING)

22. EE486   SOFT COMPUTING

23. EE488   INDUSTRIAL AUTOMATION (ME464/ ROBOTICS AND AUTOMATION)

24. EE494   INSTRUMENTATION SYSTEMS

25. EC482   BIOMEDICAL ENGINEERING

26. FT482   FOOD PROCESS ENGINEERING

27. FT484   FOOD STORAGE ENGINEERING

28. FT486   FOOD ADDITIVES AND FLAVOURING

29. IE482   FINANCIAL MANAGEMENT

30. IE484   INTRODUCTION TO BUSINESS ANALYTICS

31. IE486   DESIGN AND ANALYSIS OF EXPERIMENTS

32. IE488   TOTAL QUALITY MANAGEMENT

33. IC482   BIOMEDICAL SIGNAL PROCESSING

34. IT482   INFORMATION STORAGE MANAGEMENT

35. MA482   APPLIED LINEAR ALGEBRA

36. MA484   OPERATIONS RESEARCH (ME 372/ OPERATIONS RESEARCH)

37. MA486   ADVANCED NUMERICAL COMPUTATIONS

38. MA488   CRYPTOGRAPHY

39. MP482   PRODUCT DEVELOPMENT AND DESIGN

40. MP469   INDUSTRIAL PSYCHOLOGY & ORGANIZATIONAL BEHAVIOUR

41. MP484   PROJECT MANAGEMENT

42. MT482   INDUSTRIAL SAFETY

43. FS482   RESPONSIBLE ENGINEERING

44. SB482   DREDGERS AND HARBOUR CRAFTS

45. HS482   PROFESSIONAL ETHICS