Programme: B.Tech

Electronics & Communication Engineering

Scheme and Syllabi

w.e.f. Academic Session 2018-19

BUEST

SCHOOL OF ENGINEERING & EMERGING TECHNOLOGIES

(Common Curriculum for B. Tech I year – All Branches)

Semester - I

(Group-A)

Sr.	Code	Subject	L	T	P	Credit
1	UMA-101	Engineering Mathematics I	3	1	0	3.5
2	UPY-101	Engineering Physics	3	1	2	4.5
3	UCS-103	Fundamentals of Computer & C programming	3	1	2	4.5
4	UHU-101	Communication & Professional skills in English	3	0	2	4.0
5	UEC-105	Principles of Electronics Engineering	3	1	2	4.5
6	UME-105	Principles of Mechanical Engineering	3	1	2	4.5
7	UPD-101	Personality Development Program (PDP)	2	0	0	1.0
		Total	**20**	**5**	**10**	**26.5**

Total Hours: 35

(Group-B)

Sr.	Code	Subject	L	T	P	Credit
1	UMA-101	Engineering Mathematics I	3	1	0	3.5
2	UCH-101	Engineering Chemistry	3	1	2	4.5
3	UCS-103	Fundamentals of Computer & C programming	3	1	2	4.5
4	UEE-105	Principles of Electrical Engineering	3	1	2	4.5
5	UEG-101	Engineering Drawing	0	0	6	3.0
6	UEN-101	Environmental Science	3	0	0	3.0
7	UWP-110	Workshop Practice	0	0	3	1.5
		Total	**15**	**4**	**15**	**24.5**

Total Hours: 34

(Common Curriculum for B. Tech I year – All Branches)

Semester - II

(Group-A)

Sr.	Code	Subject	L	T	P	Credit
1	UMA-102	Engineering Mathematics II	3	1	0	3.5
2	UCH-101	Engineering Chemistry	3	1	2	4.5
3	UCS-102	Advanced C Programming	3	1	2	4.5
4	UEE-105	Principles of Electrical Engineering	3	1	2	4.5
5	UEG-101	Engineering Drawing	0	0	6	3.0
6	UEN-101	Environmental Science	3	0	0	3.0
7	UWP-110	Workshop Practice	0	0	3	1.5
		Total	**15**	**4**	**15**	**24.5**

Total Hours: 34

(Group-B)

Sr.	Code	Subject	L	T	P	Credit
1	UMA-102	Engineering Mathematics II	3	1	0	3.5
2	UPY-101	Engineering Physics	3	1	2	4.5
3	UCS-102	Advanced C Programming	3	1	2	4.5
4	UHU-101	Communication & Professional skills in English	3	0	2	4.0
5	UEC-105	Principles of Electronics Engineering	3	1	2	4.5
6	UME-105	Principles of Mechanical Engineering	3	1	2	4.5

7	UPD-101	Personality Development Program (PDP)	2	0	0	1.0
		Total	**20**	**5**	**10**	**27.5**

Total Hours: 35

SUMMER BREAK

Sr.	Code	Subject	L	T	P	Credit
1.	UTR- 201	Industrial Training	0	0	0	4

SEMESTER –III

Sr.	Course No.	Course name	L	T	P	Credit
1	UEC-200	Electronics Devices and Circuits	3	1	2	4.5
2	UEC-201	Digital Electronics	3	1	2	4.5
3	UEE-202	Circuit Theory	3	1	-	3.5
4	UEC-203	Signals & System	3	1	-	3.5
5	UMG-200	Principles of Engineering Economics & Management	3	1	-	3.5
6	UMA-201	Numerical Analysis and Computer Programming	3	1	2	4.5
7	UEC-204	MATLAB	-	-	2	1
8	UTR-201	Industrial Training **(Undertaken During Summer Vacations)**	0	0	0	4.0
9	UPD-201	Personality Development Program (PDP)	2	0	0	2
TOTAL			**20**	**6**	**08**	**31**

Total Hours: 34

SEMESTER –IV

Sr.	Course No.	Course name	L	T	P	Credit
1	UEC-250	Electronic Logic Circuit Design	3	1	2	4.5
2	UEC-251	Control System Engineering	3	1	-	3.5
3	UEC-252	Analog Communication	3	1	2	4.5
4	UEC-253	Linear Integrated Circuits & Applications	3	1	2	4.5
5	UEC-254	Computer Architecture	3	1	-	3.5
6	UCS-252	Operating System	3	1	2	4.5
7	UPD-251	Personality Development Program (PDP)	2	0	0	2
8	UGP-251	General Proficiency	-	-	-	2
TOTAL			**20**	**6**	**8**	**29**

Total Hours: 34

SUMMER BREAK

Sr.	Code	Subject	L	T	P	Credit
1.	UTR- 301	Industrial Training	0	0	0	4

SEMESTER –V

Sr.	Code	Course name	L	T	P	Credit
1	UEC-300	Microprocessors & Applications	3	1	2	4.5
2	UEC-301	Microelectronics	3	1	-	3.5
3	UEC-302	Digital Communication	3	1	2	4.5
4	UEC-303	Field Theory	3	1	2	4.5
5	UEC-304	Electronic Measurement & Measuring Instruments	3	1	2	4.5
6	UEC-305	Virtual Instrumentation Lab	-	-	2	1
7	UTR-301	Industrial Training **(Undertaken During Summer Vacations)**	-	-	-	4
8	UPD-301	Personality Development Program (PDP)	2	0	0	2
TOTAL			**17**	**5**	**10**	**28.5**

Total Hours: 32

SEMESTER-VI

Sr.	Course No.	Course name	L	T	P	Credit
1	UEC-350	Antenna & Wave Propagation	3	1	-	3.5
2	UEC-351	Digital Signal Processing	3	1	2	4.5
3	UEC-352	Mobile and Satellite Communication	3	1	0	3.5
4	UEC-353	Microwave Engineering	3	1	2	4.5
5	UEC-354	Computer Networks & Data Communication	3	1	2	4.5
6	UEC-355	Embedded System Design	3	1	2	4.5
7	UPD-351	Personality Development Program (PDP)	2	0	0	2
8	UEC-356	Programming in Python			2	1
9	UGP-351	General Proficiency	-	-	-	2
TOTAL			**20**	**6**	**10**	**30**

Total Hours: 36

SUMMER BREAK

Sr.	Code	Subject	L	T	P	Credit
1.	UTR- 401	Industrial Training	0	0	0	4

SEMESTER –VII

Sr.	Code.	Course name	L	T	P	Credit
1	UEC-400	Radar & Navigation	3	1	-	3.5
2	UEC-401	Digital System Design	3	1	2	4.5
3	UEC-402	Optical Fiber System & Networks	3	1	2	4.5
4	**UEC-XXX**	**Departmental Elective-I**	3	1	-	3.5
5	**UXX-XXX**	**Open Elective-I**	3	1	-	3.5
6	UEC-408	Industrial Training **(Undertaken During Summer Vacations)**	-	-	-	4
7	UEC-409	Minor Project	-	-	4	2
8	UPD-401	Personality Development Program (PDP)	2	0	0	2
TOTAL			**17**	**5**	**8**	**27.5**

Total Hours: 30

SEMESTER –VIII

Sr.	Code	Course name	L	T	P	Credit
1	UEC-451	Digital Image Processing	3	1	0	4.5
2	UEC-452	Biomedical Electronics	3	1	-	3.5
3	**UEC-XXX**	**Departmental Elective-II**	3	1	-	3.5
4	**UXX-XXX**	**Open Elective-II**	3	1	-	3.5
5	**UXX-XXX**	**Open Elective-III**	3	1	-	3.5
6	UEC-461	Major Project /OJT	-	-	9	4.5
7	UPD-451	Personality Development Program (PDP)	2	0	0	2
8	UGP-451	General Proficiency	-	-	-	2
TOTAL			**17**	**5**	**9**	**23.5**

Total Hours: 31

DEPARTMENTAL ELECTIVES

Departmental Elective-I (Semester-V11)										
S.NO	**Basket 1**		**Basket 2**		**Basket 3**		**L**	**T**	**P**	**Cr**
	Course Code	**Course Title**	**Course Code**	**Course Title**	**Course Code**	**Course Title**				
1	UEC-403	Neural Networks & Fuzzy Logic	UEC-404	Industrial Electronics	UEC-405	VLSI Design	3	1	0	3.5
2	UEC-404	Industrial Electronics	UEC-406	Information Theory & Coding	UEC-403	Neural Networks & Fuzzy Logic	3	1	0	3.5
3	UEC-406	Information Theory & Coding	UEC-403	Neural Networks & Fuzzy Logic	UEC-406	Information Theory & Coding	3	1	0	3.5

Departmental Elective-II (Semester-VIII)										
S.NO	**Basket 1**		**Basket 2**		**Basket 3**		**L**	**T**	**P**	**Cr**
	Course Code	**Course Title**	**Course Code**	**Course Title**	**Course Code**	**Course Title**				
1	UEC-453	Advanced Signal Processing	UEC-454	Digital Image Processing	UEC-453	Advanced Signal Processing	3	1	0	3.5
2	UEC-454	Digital Image Processing	UEC-455	Multimedia System	UEC-456	Nano Technology	3	1	0	3.5
3	UEC-457	Television Engineering	UEC-458	Artificial Intelligence	UEC-455	Multimedia System	3	1	0	3.5

OPEN ELECTIVES

Open Elective-I (Semester-VII)						
S.NO	**Course Code**	**Course Title**	**L**	**T**	**P**	**Cr**
1	UCS-480	Software Project Management	3	1	0	3.5
2	UCS-481	Distributed Operating System	3	1	0	3.5
3	UME-410	Basic Manufacturing Technology	3	1	0	3.5
4	UME-411	Measurement Techniques	3	1	0	3.5
5	UEE-403	Energy Management	3	1	0	3.5
6	UEE-452	Non- Conventional Electrical Power Generation	3	1	0	3.5
7	UCE-312	Advanced Construction Techniques & Project Management	3	1	0	3.5
8	UCE-365	Advanced Environmental Engineering	3	1	0	3.5
9	UMG-476	Human Ethics & Values	3	1	0	3.5

Open Elective-II (Semester-VIII)						
S.NO	**Course Code**	**Course Title**	**L**	**T**	**P**	**Cr**
1	UCS-482	Grid Computing	3	1	0	3.5
2	UCS-483	Software Reliability	3	1	0	3.5
3	UME-464	Renewable Energy Sources	3	1	0	3.5
4	UME-466	Automation & Robotics	3	1	0	3.5
5	UEE-457	Transformer Engineering	3	1	0	3.5
6	UEE-411	Direct Energy Conversion	3	1	0	3.5
7	UCE-311	Advanced Concrete Technology	3	1	0	3.5
8	UCE-409	Geographic Information System for Resource Management	3	1	0	3.5
9	UMG-450	Entrepreneurship Development & Engineering Management	3	1	0	3.5

Open Elective-III (Semester-VIII)						
S.NO	**Course Code**	**Course Title**	**L**	**T**	**P**	**Cr**
1	UCS-484	E-Commerce & ERP	3	1	0	3.5
2	UCS-485	Data warehousing & Data Mining	3	1	0	3.5
3	UME-459	Engineering In Industry & Entrepreneurship	3	1	0	3.5
4	UME-458	Emerging Automotive Technologies	3	1	0	3.5
5	UEE-456	Hydro Power Station Design	3	1	0	3.5
6	UEE-408	Illumination Engineering	3	1	0	3.5
7	UCE-410	Building Project and Estimates	3	1	0	3.5
8	UCE-476	Disaster Management	3	1	0	3.5
9	UMG-475	Total Quality Management	3	1	0	3.5

Typical Curriculum Structure of AICTE for UG ECE Degree Programmes

S. No.	Course Work - Subject Area	Range of Total *Credits (%)* ***Minimum*** ***Maximum***		B.Tech. ECE (BUEST)
1.	Humanities and Social Sciences **(HS)**, including Management;	**05**	**10**	**10.5**
2.	Basic Sciences**(BS)** including Mathematics, Physics, Chemistry, Biology;	**15**	**20**	**16**
3.	Engineering Sciences **(ES),** including Materials, Workshop, Drawing, Basics of Electrical/Electronics/Mechanical/Computer Engineering, Instrumentation;	**15**	**20**	**26.5**
4.	Professional Subjects-Core **(PC),** relevant to the chosen specialization/branch; (May be split into Hard (no choice) and Soft(with choice), if required;)	**30**	**40**	**114.5**
5.	Professional Subjects – Electives **(PE)**, relevant to the chosen specialization/branch;	**10**	**15**	**07**
6.	Open Subjects- Electives **(OE)**, from other technical and/or emerging subject areas;	**05**	**10**	**07**
7.	Project Work, Seminar and/or Internship in Industry or elsewhere.	**10**	**15**	**18.5**
8.	Personality Development and General Proficiency	**Credits**		**20**
Total Credits				**220.5**

SEMESTER I & II

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name :- Engineering Mathematics-I

Course Code: - UMA-101

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L	T	P	Cr
3	1	0	3.5

Unit–I: Calculus of one variable

Differential Calculus: Successive Differentiation, Leibnitz Theorem, Expansion of Function Maclaurin's and Taylor's expansion, Indeterminate forms, Approximation of errors.

Unit-II: Calculus of two variables

Partial Differentiation, Partial Derivatives, Euler's Theorem Total Differentiation, Jacobians and their properties. Maxima and Minima of two variables, Lagrange's Method of Undetermined multipliers. Multiple integrals, Change of order, Area, length, volume and surface area.

Unit – III: Vector Calculus

Gradient, divergence and curl of a vector and their physical interpretations, Line, surface and Volume integrals, statement and Theorem of Green, Stoke and Gauss and their applications.

Unit-IV: Complex Analysis

Brief Review of Complex Number,Functions of Complex Variable,Analytic Functions,Cauchy Reimann Equations,Milne Thompson Method,Singularities,Cauchy Integral Theorem,Cauchy Residue Theorem.

Text Book:

1. P.K. Mittal, "Engineering Mathematics" , Vrinda Prakashan
2. Complex Analysis, R.V. Churchill and Brown,Fifth Editon and Mc Graw Hill Series.

Reference Books:

1. Calculus, Anton, Bivens & Davis, John wiley & Sons, New York.
2. Advanced Engg. Mathematics, Erwin Kreyszig, John Wiley & Sons, NewYork.
3. Advanced Engg. Mathematics, Michael D. Greenberg, Pearson Education.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Engineering Chemistry

Course Code: - UCH-101

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L	T	P	Cr
3	1	2	4.5

Unit-I

Polymers and Polymerization- organic polymers, polymerization, various types of polymerization, effect of structure on properties of polymers, preparation properties and technical application of thermo-plastics (PVC, PVA, Polyamides), thermosets (PF,UF), and elastomers (SBR,GR-M), Silicones .

Inorganic Engineering Materials.

Introduction and applications of glass, cement gypsum, lime, plaster of paris,

Composites- Classification, advantages & application of composites.

Refractories- Introduction, classification, properties & important refractory materials & applications.

Unit – II

Water Chemistry: Introduction, Sources of water, Impurities, Hardness, Units, Chemical analysis of water-free chlorine, alkalinity, Estimation of hardness by EDTA method, Analysis by EDTA method, Oxidations (BOD & COD), Boiler Corrosion, Carry Over- Priming and foaming, Scales and Sludges, Caustic embrittlement. Sewage & Treatment, Drinking water treatment, Desalination of water, Softening methods and related numerical problems.

Corrosion -A Threat: Introduction, Types of corrosions, Electrochemical Theory, Pitting, Water Line, Differential Aeration corrosions, Stress Corrosion, Factors affecting Corrosion, Preventive measures.

Unit-III

Lubricants: Introduction, Functions of Lubricants, Mechanism of Lubrication, Additives, Greases and Emulsions, Properties of Lubricants - Viscosity Index, Fire & Flash point, Pour & Cloud point, Aniline point, saponification number, acid number.

Fuels and Combustion: Introduction, class of fuels (Solid, Liquid and Gases) Coal and its origin, Analysis of Coals, Petroleum fuels, Crude Petroleum and its refining, Cracking, Synthetic petrol, knocking, octane number Reforming Hydro finishing and Diesel, cetane number Kerosene, Gasoline.: Coal gas, Oil Gas, Bio- Gas, Nuclear Fuel.

Unit - IV

Stereo Chemistry: Structures, types, applications and stereochemistry of natural products like alkaloids, steroids, quininoids terpenoides including, allenes and biphenyls**.**

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Soil Chemistry: Soil pH, Inorganic & organic components in soils, Acid base & Ion exchange reactions in soils, Micronutrients and macronutrients, soil testing, Nitrogen pathways and NPK in soil.

Text Books:

1. Engineering Chemistry: By P.C.Jain & Monika Jain, Dhanpat Rai and Sons.
2. A Text Book of Engineering Chemistry: By Shashi Chawla, Dhanpat Rai & Sons.
3. Physical Chemistry: By R.P.Verma, Pardeep Publishers Jallandhar.
4. Chemistry in Engineering & Technology, Vol.I & Vol.II, Rajaram, Kuriacose (TMH).

Reference Books:

1. Physical Chemistry, P.W.Atkin (ELBS, Oxford Press)
2. Chemistry of Natural products by OP Aggarwal.
3. Engineering Chemistry- by A.K. Tripathi Satya Prakashan, New Delhi.
4. Stereo Chemistry of Organic Compounds by P.S. Kalsi.
5. Environmental Chemistry by A.K. De , New Age International Publishers

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Chemistry Lab

Course Code :- UCH-101

Evaluation Components for Practical Courses (Students are required to perform at least 8 practical mandatorily from the given list of practical)	
Lab Performance	10
Lab file work	10
Viva – Voce	10
Total	**30**

L	**T**	**P**	**Cr**
3	**1**	**2**	**4.5**

1. To determine the solid carbon, volatile matter, ash content and percentage of moisture in given sample of coal by proximate analysis method and classify the coal.
2. To determine the total alkalinity in a given sample of water using a standard acid.
3. To determine the percentage of Chlorine in a given sample of CaOCl2 which has been dissolved in one liter of solution.
4. To determine the surface tension of the two given unknown liquids by using Stalgmometer and identify the given liquid.
5. To determine the coefficient of viscosity of the given unknown liquids by using Ostwald's Viscometer and identify the given liquid.
6. To determine the coefficient of viscosity of the given lubricating oil using Red Wood Viscometer
7. To determine the surface tension of the given liquid by drop number method by using Stalgmometer and identify the given liquid.
8. To determine the flash point and fire point of given sample of oil using Pens key Marten's apparatus.
9. To determine the amount of Chlorine in given sample of water approximate N/20 sodium Thiosulphate solution. Ask for your requirement.
10. Estimation of calcium as CaO volumetrically in cement.
11. To determine the chemical oxygen demand of waste water.
12. To prepare phenolformaldehyde resin.
13. To prepare Hexamethylenediamine Adipic acid (Nylon 66) polymer.
14. Determine of total hardness of water by EDTA method.
15. To determine cloud and pour point of lubricating oil.
16. Preparation of Urea Formaldehyde resin.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Fundamentals of Computer & C Programming

Course Code: - UCS-101

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Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L	T	P	Cr
3	1	2	4.5

Unit-I

An Overview of Computer System: Anatomy of a digital Computer, various kinds of registers in CPU and their roles, Classification of Computers, Generations of computers, hardware, software, firmware, von Newman and Harvard Architecture.

Memory: Classification of memory- Main, Auxiliary memory and Cache memory, Memory Hierarchy.

Secondary storage devices: Hard disk, Floppy disk.

Input Devices: Keyboard, Mouse, Joystick, etc.

Output Devices: Monitors (CRT, TFT, Plasma panels) Printers (Dot-Matrix, Inkjet, Laser), plotters, Optical mark readers**.**

Radix number system: Decimal, Binary, Octal, Hexadecimal numbers and their inter-conversions; Representation of information inside the computers.

Unit-II

Programming Languages: Machine, Assembly, and High Level Language, introduction to Assembler, Compiler, Interpreter, seven phases of compilers, symbol Table, Debuggers, Linker and Loader.

Programming fundamentals: Algorithms, pseudo codes and Flowcharts, Debugging, testing and documentation, structure-programming concepts, top down and bottom-up design approaches.

Operating System Basics: Introduction and Functions of Operating System, Types of OS and case studies on NT, XP, 2000 and Linux. 13. Operating System**:** Revision of functions of O.S., Windows installation, NT, 2000, XP and Linux Case Studies.

UNIT-III

Networking: Introduction to network, LAN, WAN, MAN, Internet and WWW, Introduction to e-mail.

Introduction: Structure of a C Program, C Compilers, Editing, Compiling & Running of a C program, Data types, Constants and Variables, Operators and Expressions, Different types of expressions and their Evaluation, Conditional Expression, Assignment statement, Library functions, typecasting.

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UNIT-IV

Decision Control Structure: Decision making using if, if-else, elseif and switch statements**.**

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Iterative Statements: Looping using for, while and do-while statements, Transferring Program control using break, continue and goto statements.

Text Book:

1. Computer fundamentals: P. K. Sinha, BPB
2. Teach yourself all about computers: Barry Press and Marcia Press, IDG Books India
3. Spirit of C: Mullis Cooper, Jacob Publications

Reference Books:

1. Let us C: Yashwant kanetkar, BPB
2. The C Programming: Language,Kerningha, B.W. & Ritchie D. M--PHI
3. Programming in C: Gotterfied B, Tata McGraw Hill
4. C programming a Practical Approach: Ajay Mittal, Pearson Education

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Computer Lab

Course Code :- UCS-101

Evaluation Components for Practical Courses (Students are required to perform atleast 8 practicals mandatorily from thr given list of practicals)	
Lab Performance	10
Lab file work	10
Viva – Voce	10
Total	**30**

DOS:

1. Study of internal commands of DOS
2. Study of external commands of DOS.

C Programming:

Write a program to find the largest of three numbers (if-then-else).

1. Write a program to find the largest number out of ten numbers (for statement).
2. Write a program to find the average male height & average female heights in the class (input is in form of sex code, height).
3. Write a program to find roots of quadratic equation using functions and switch statement.
4. Write a program using arrays to find the largest and second largest no.
5. Write a program to produce ASCII equivalent of given number
6. Write a program to find divisor or factorial of a given number.
7. Write a recursive program for Factorial of a number.
8. Write a pragram to print Fibonacci sequence of numbers is 0, 1, 1, 2, 3, 5, 8……
9. Write a program that takes two operands and one operator from the user perform the operation and then print the answer
10. Write a pragram to find sum of digits of a number.
11. Write a pragram to find reverse of a number.
12. Write a pragram to check if a number is Armstrong number
13. Write a pragram to check if an entered number is palindrome.
14. Write a pragram to print the following outputs:

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

1

2 2

3 3 3

4 4 4 4

5 5 5 5 5

Note: - Record to be maintained both electronically and hard copy for evaluation.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Principles of Electrical Engineering

Course Code :- UEE-105

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L	T	P	Cr
3	1	2	4.5

Unit-I

D.C.circuits: Ohm's law, Kirchoff's Laws, Thevenin's, Norton's, superposition theorem, Maximum power transfer theorem, Nodal and Mesh analysis.

A.C. circuits: Sinusoidal signal, instantaneous and peak values, RMS and average values, phase angle, polar and rectangular, exponential and trigonometric representations RL and C components, behavior of these components in A.C. circuits, concept of complex power, power factor.

Transient Response: transient response RL, RC and RLC circuits with step input.

Unit-II

Series and Parallel A.C. circuits: Series and Parallel A.C. circuit, Series and Parallel resonance. Q factor, cut off frequency and bandwidth.

Three phase circuits: Phase and line voltages and currents, balanced star and delta circuits, power equation, measurement of power by 2-wattmeter method, importance of earthling.

UNIT-III

Electromagnetism: Basic concepts of magnetic circuits, Series magnetic circuits, parallel magnetic circuits, series parallel magnetic circuits, analogy between electrical and magnetic circuits, magnetic circuit with air gap, Laws of electromagnetic induction, self inductance, mutual inductance, coefficient of coupling.

Basic concepts of transformers and rotating electrical machines (operating principle, construction and applications).

UNIT-IV

Measuring Instruments: Voltmeter, Ammeter, Wattmeter, Energy meter.

Batteries: Storage batteries:- Types, construction, charging and discharging, capacity and efficiency of Lead-acid batteries.

Text Books:

1. Kothari & Nagarath: Basic Electrical Engg. (2^{nd} Edition), TMH.

Reference Books:

2. B.L. Theraja & A.K. Theraja, S.Chand: Electrical Technology (Vol-1).
3. Deltoro: Electrical Engg Fundamentals, PHI.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Principles of Electrical Engineering Lab
Course Code :- UEE-105

Evaluation Components for Practical Courses (Students are required to perform atleast 8 practicals mandatorily from the given list of practicals)	
Lab Performance	10
Lab file work	10
Viva – Voce	10
Total	**30**

L T P Cr
3 1 2 4.5

List of Experiments:

1. To verify KCL and KVL.
2. To study frequency response of series RLC circuit and determine resonance frequency.
3. To study frequency response of parallel RLC circuit and determine resonance frequency.
4. To perform direct load test of transformer and plot efficiency v/s load characteristics.
5. To study and verify Thevenins, Norton's, superposition and maximum power theorems.
6. To perform O.C and S.C test of transformer.
7. To study various types of meters.
8. Measurement of power by 3 voltmeter / 3 ammeter method.
9. Measurement of power in 3-phase system by 2-wattmeter method

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Engineering Drawing

Course Code :- UEG-101

Evaluation Components for Practical Courses (Students are required to perform atleast 8 practicals mandatorily from the given list of practicals)	
Lab Performance	10
Lab file work	10
Viva – Voce	10
Total	**30**

L	**T**	**P**	**Cr**
0	**0**	**6**	**3.0**

Unit-I

Introduction to Conventional Drawing

Various types of lines, Principles of drawing, Size & Location as per IS code (SP-46) for general engg. Drawing, Dimensioning exercises Conventional exercise of Lettering Techniques, Drawing pertaining to symbols, Free hand lettering techniques (in letters & numerals in 3, 5, 8 & 12mm sizes), Vertical & Inclined Drawing at 75^{o}. Instrumental lettering in single stroke, Linear, Diagonal & Vernier Scale, BIS Conventions.

Computer Aided drawing

Computer Screen, Layout of software, std. tool bar/menus & description of most commonly used tool bars, navigation tool bars & tools. Co-ordinate system and reference planes. Definitions of HP, VP, RPP, & LPP. Creation of 2D/3D environment. Selection of drawing size and scale. Commands & creation of lines, Commands and creation of lines, Co-ordinate points, axes, poly lines, square, rectangle polygons, splines, circles, ellipse, text, move, copy, off-set, mirror, rotate, trim, extend, break, chamfer, fillet, curves, constraints viz. tangency, parallelism, inclination & perpendicularity, Dimensioning, Line convention, material conventions & lettering

Unit-II

Orthographic Projections

Definition- Planes of Projection, reference lines & conventions employed, Projections of points in all four quadrants, Projections of straight lines (located in first quadrants/first angle only), true and apparent lengths, true & apparent indications to reference planes**.**

Orthographic Projections of Plane Surfaces & Engg. Objects (First Angle Projections only)

Definitions- Projections of plane surfaces-triangle, square rectangle, rhombus, pentagon, hexagon & circle, planes in different positions by change of position method only (No problem on punched & composite plates), Engg. Objects projections.

Unit-III

Projections of Solids (First Angle Projections only)

Definitions- Projections of right regular-tetrahedron, hexahedron (cube), prisms, pyramids, cylinders and cones in different positions**.**

Isometric Projections (Using Isometric scales) Isometric scale & projection of simple plane figures, Isometric projections of tetrahedron, hexahedron (cube), right regular prisms, pyramids, cylinders, cones, spheres, cut spheres & combination of solids

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Unit-IV

Sections & Development of lateral surfaces of solids

Section planes, Sections, Section views, Apparent shapes, & true shapes of sections of regular prisms, pyramids, cylinders and cones resting with base on HP, Sectioning of Engg. Objects, Developments of lateral surfaces of trays, tetrahedrons spheres and transition pieces

Text Books

1. P.S. Gill: Engg. Drawing & Engineering Graphics
2. N.D. Bhatt: Elementary Engg. Drawing

Reference Books:

1. A primer on Computer Aided Drawing-2006: Published by VTU, Belgaum
2. Computer Aided Engg. Drawing: S.Trymbaka Murthy, I.K. International Publishing

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Environmental Science

Course Code :- UEN-101

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr
3 0 0 3.0

UNIT-I

The Multi-disciplinary nature of environmental studies & Definition Scope & importance, Need for public awareness, Inter- relationship of technology growth.

Natural Resources-Renewable & Non Renewable resources, Forest resources- use & over exploitation, deforestation, Timber extraction, Dams & their effects on forests & tribal people, Water Resources-Use & over utilization of surface & ground, water, floods, draughts-conflicts over water dams benefits & problems, Mineral Resources- Use & over Exploitation, environmental effects of extracting & mineral resources, Food Resources- world food problems changes caused by agriculture & over grazing effects of modern agriculture fertilizer & pesticide problems, water logging, saliency, Energy Resources growing energy needs, renewable & Non-Renewable energy sources, use of alternate energy, Land resources- land as resource, land degradable, man induced land sleds, Soil erosim & desertifical, individual role in conservation of natural resources, Equatable use of resources for sustainable life style.

UNIT-II

Ecosystems- Natural Ecosystems- Concept, Structure & Function, Ecological Succession, Flow of energy in Ecosystem, Ecological Succession, Brief Features of Forest, Grass Land, Desert & Aquatic ecosystem.

Biodiversity- Different genetic & ecosystem diversity, Biogeography classification in it, Biodiversity at global, National & Local levels, Biosphere cycles, Carbon Dioxide Cycle, Eco-Imbalance system, Principles, effects.

UNIT-III

Environmental Pollution- Definition, Causes effects & Control measures of Air, Water, Soil, Marine, Thermal pollution, Nuclear Hazards, Industrial Hazard & safety, Solid Waste & E- waste management causes, effects & control measures of urban & industrial, Role of individual to prevent pollution, Disaster Management, Floods, Earthquakes cyclone & landslides, Brief introduction to safely Engineering.

UNIT-IV

Human Population & Environment-Population growth, Variation among nations, Population Explosion, Environment & Human Health, Human Rights, Value Education, Women Child

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Welfare, HIV/AIDS-its causes, effects, & control, Role of information Technology in Environment & Human Health, Environment Acts & Social Issues from unsustainable to sustainable development, Urban problems released to energy, water conservation, Rain Water harvesting, watershed management, Resettlement & Rehabilitation of people, its problems & concerns, Environmental Ethics- Issues & possible solutions, Climate change, Global Warming, Acid rain, Ozone layer depletion, Nuclear accidents & holocaust consumerism & waste products, Environment Protection Act Air (Prevention & Control of Pollution) Act-1981 Water (Prevention & Control of Pollution) Act – 1974 Forest Servation Act – 1980 Wildlife protection Act- 1972 , Issue involved in enforcement of environmental legislation.

Text Books:

1. Environment Education: S.S. Randhawa**,** S.Vikas & Co. Publications
2. E-Waste-Implications, management & regulations in India and current global best practices: Rakesh Johri, TERI New Delhi

Reference Books:

1. Environment Science: Kaushik, New Age International
2. Environmental Science & Engineering: S.K. Dhameja, S.K. Kataria & Sons Publications

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Workshop Practice

Course Code :- UWP-110

Evaluation Components for Practical Courses (Students are required to perform atleast 8 practicals mandatorily from the given list of practicals)	
Lab Performance	10
Lab file work	10
Viva – Voce	10
Total	**30**

L	**T**	**P**	**Cr**
0	**0**	**3**	**1.5**

Fitting shop: Study of tools and processes; One Simple exercise involving fitting work.

Carpentry Shop: Study of tools and their use, carpentry joints, and Preparation of a half-lap corner joint or mortise and tennon joints. Study of woodworking lathe.

Welding Shop: Study of tools and their use, Simple butt joint, Lap joint, different welding processes and preparation of any one welding joint.

Sheet metal shop: Study of tools and operations, Making one job out of the following: funnel complete with soldering / Fabrication of tool box / tray / electrical panel box etc.

Machine Shop: Study and demonstration of tools and operations on Lathe / Shaper / Milling machine / Grinding machine / Drilling machine.

Materials: Study of different materials of engineering use, Ferrous & Non ferrous materials and their constituents, Properties and their applications. Heat treatment of ferrous metals and its importance, Microstructures of carbon steels

Manufacturing Processes: Study and demonstration of processes such as Rolling, Press working, wire drawing, Shearing and punching,& Plastic molding etc.

Smithy shop & Forging shop: Study of smithy process and forging process describing different methods of forging. and demonstration of a simple smithy job.

Metal Casting:

i. Study of Mold making process and with special emphasis on bench molding .
ii. Demonstration of Casting process of any simple job.

Text Books & Reference Books:

1. Hajra, Bose, Roy: Workshop Technology, Vol 1 & 2, Media Promotors
2. Raghuvanshi B.S.: Workshop Technology, Vol 1 & 2, Dhanpatrai

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Engineering Mathematics-II

Course Code :- UMA-102

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L	T	P	Cr
3	1	0	3.5

Unit - I: Linear Algebra

Rank of a Matrix, consistency and inconsistency of a system of Linear equations, Elementary row and column transformations inverse of matrices, Eigen Values and eigen vectors. Cayley Hamilton Theorem, Diagonalization, Vector spaces R^n over R, linear transformations R^n to R^m

Unit – II: Differential Equations:

Solution of first order and first degree differential equations: variables separable, homogeneous, exact, linear and equation reducible to above types. Linear Differential equations of nth order with constant coefficients. Complementary functions and particular integrals, Ordinary simultaneous equations.

Unit – III: Laplace Transform

Laplace transform, existence theorem, Laplace transform of derivatives and integrals, Inverse laplace transform, Unit Step function, Dirac delta function, Laplace transform of periodic function, Convolution Theorem. Applications to solve simple linear and simultaneous diff equations.

Unit-IV: Fourier Transform

Fourier series, Euler formulae, half range series, Fourier integral & Fourier Transform.

Text Books:

1. P.K. Mittal: Engineering Mathematics, Vrinda Prakashan

Reference Books:

1. Calculus: Anton, Bivens & Davis, John wiley & Sons, New York.
2. Advanced Engg. Mathematics: Erwin Kreyszig, John Wiley & Sons, NewYork.
3. Advanced Engg. Mathematics: Michael D. Greenberg, Pearson Education.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Engineering Physics

Course Code :- UPY-101

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L	T	P	Cr
3	1	2	4.5

Unit-I

Optics:

Interference: Division of wave front & Division of amplitude – Fresnel's biprism , Thin film interference & Newton's rings. Michelson interferometer and its applications.

Diffraction: Fresnel and Fraunhofer diffraction, Half period zone, zone plate, diffraction at straight edge, plane transmission grating. Dispersive power & resolving power of a grating.

Fiber Optics: Introduction, acceptance angle, numerical aperture, type of optical fiber- step index and graded index fibers, applications of optical fibers in communication.

Laser: Spontaneous and stimulated emission of radiation, Population inversion and optical pumping, Principle and production of laser ,three and four level laser, Construction and working of Ruby and He-Ne laser

Unit-II

Electrostatics and Electrodynamics

Basic laws of electricity & magnetism, Gradient, Divergence and Curl and their physical meaning , Divergence and Stokes theorems, continuity equation, Maxwell's equations in integral and differential forms, Electromagnetic wave propagation in free space, Poynting vector.

Relativistic Mechanics:

Inertial and non-inertial frames, Galilean transformations, Michelson–Morley experiment , Einstein's postulates of special theory of relativity, Lorentz transformation equations.

Length contraction, time-dilation, Addition of velocities,Variation of mass with velocity and mass-energy relation, Relativistic energy-momentum transformation.

Unit-III

Quantum Mechanics:

Quantum theory of light, photoelectric effect, Compton effect, pair production, matter waves and de-broglie hypothesis, particle diffraction, uncertainty principle and applications.

Postulates of quantum mechanics and Schrödinger theory, time dependent and time independent Schrodinger wave equation, wave function, Born interpretation and normalization, expectation. values. Applications to particle in a box (infinite potential well) finite potential step and barrier problems, tunneling, linear harmonic oscillator (one dimensional).

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Unit-IV

Statistical physics:

Classical and Quantum statistics: Maxwell –Boltzmann statistics, Bose- Einstein and Fermi- Dirac statistics, Fermi energy, free electron model and its applications.

Super conductivity:

Occurrence,destruction of super conductivity, Meissen effect, type I and type II Super-conductors; applications of superconductors.

Text Books:

1. Concepts of Modern physics: Beiser (Tata Mc Grow Hill)
2. Fundamentals of Physics: Resnick, Halliday, and Walker (Wiley)
3. Principles of Physics: R.A. Serway and J.W. Jewett (Thomas Asia Pvt. Ltd.)
4. Optics: Jenkins & White

Reference Books:

1. Introduction to special theory of Relativity: Robert Resnick (Wiley)
2. Quantum mechanics: Schiff.
3. Quantum mechanics: Pauling & Wilson.
4. Principle of Optics: B.K. Mathur.
5. Optics: A.G. Ghatak 3rd edition (Tata McGrow Hill – 2005)
6. Optics: Brij lal and Subramaniam (S. Chand)
7. Physics part I and II: Resnick, Halliday, and Krane , John Wiley – 2002).
8. Modern Physics: Kenneth Krane, (2nd Edition, John Wiley & Sons) – 1998
9. Physics of the atom: Wehr, Richards and Adair (4th Edition, Addison- Weseley)
10. Elements of Electromagnetics: Mathew N.D., Sadiku S.A.D. (Oxford University press)
11. Electrodynamics: D.J. Giriffith.
12. Lasers: O. Svelto.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Engineering Physics Lab

Course Code :- UPH-101

Evaluation Components for Practical Courses (Students are required to perform atleast 8 practicals mandatorily from the given list of practicals)	
Lab Performance	10
Lab file work	10
Viva – Voce	10
Total	**30**

1. To determine the wavelength of monochromatic light by Newton's ring.
2. To determine the wavelength of sodium light by using plane transmission grating.
3. To determine the wavelength of sodium light by using Michelson interferometer.
4. To find the refractive index of a prism by using spectrometer.
5. To determine the attenuation loss of a signal optical fiber.
6. To determine the numerical aperture of an optical fiber.
7. To determine the low resistance of the material of given wire using Carey Foster's bridge.
8. To draw hysteresis curve of a given sample of ferromagnetic material.
9. To find the capacitances of two capacitors (air and dielectric) by De'sauty Bridge
10. To find the frequency of AC mains by using electric vibrator.
11. To find the value of high resistance by Substitution method.
12. To convert a galvanometer into an ammeter of a given range
13. To determine the variation of magnetic field along the axis of a current carrying coil and then to estimate the radius of the coil.
14. To study the Hall Effect and determine Hall coefficient, carrier density and mobility of a given semiconductor material using Hall-effect set up.
15. To determine the wavelength of He-Ne laser by using single slit experiment.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Advanced C Programming

Course Code :- UCS-102

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L	T	P	Cr
3	1	2	4.5

Unit-I

Functions: Introduction to user defined functions, passing values between function, Function Prototype and Recursion**.**

Arrays: Introduction to arrays, array initialization, array traversal, bound checking, passing array element to functions, passing entire array to a function, operations on arrays.

Two dimensional Arrays: creating a 2D array, array operations (addition, subtraction, multiplication, transpose).

Unit-II

Pointers: Introduction to pointers, pointer operator, call by value and call by reference, pointer to array and array of pointers.

Strings: Introduction to strings, string operations (strlen, strcpy, strupr, strlwr, strcat, strcmp), gets v/s scanf, puts v/s printf.

Unit-III

Structure: Use of Structures, Declaring a Structure, Accessing Structure Elements, Storing structure elements, Array of Structures, pointer to structure.

Union: Difference between union and structures, Introduction to enumerations.

Unit: IV

File Handling: Classification of files, file opening modes, Operations on text and binary files (reading, writing, copying, and concatenation).

Text Books:

1. Computer fundamentals: P. K. Sinha, BPB
2. Teach yourself all about computers: Barry Press and Marcia Press, IDG Books India

Reference Books:

1. Spirit of C: Mullis Cooper, Jacob Publications
2. Let us C: Yashwant Kanetkar, BPB
3. The C Programming Language, Kerninghan B.W. & Ritchie D. M, PHI
4. Programming in C: Gotterfied B,Tata McGraw Hill
5. C programming a Practical Approach: Ajay Mittal, Pearson Education

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Computer Lab

Course Code :- UCS-102

Evaluation Components for Practical Courses (Students are required to perform atleast 8 practicals mandatorily from thr given list of practicals)	
Lab Performance	10
Lab file work	10
Viva – Voce	10
Total	**30**

1. Write a C program to enter N natural numbers in ascending order in 1-D array, and apply linear and binary search on it.
2. Reading N integers in 1-D array and sort them using Bubble sort and calculate their mean, median.
3. Write c program to evaluate polynomials like p(x)=a*x*x+b*x+c etc. using Horner's Rule.
4. Write a program to read two matrices A and B and compute A+B, A-B, A*B, A and B transpose.
5. Write a program to demonstrate call by value and call by reference (use swapping of two numbers), write function to calculate square and cube of a number.
6. Write program to read single and strings separated by space (using gets ()), perform strlen, contact, strup,strcmp on them using appropriate functions.
7. Create a Program using structures and Union which reads Name, Age and Salary of employee print them using dot and -> operators.
   Using enum for name in place of integer values.
   WAP to open a file and print its content on screen.
8. Write a program to edit and print the content of a pre written file.
9. Reading and Write file in Text and binary modes.
10. Write a program which prints its source code.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Communication & Professional Skills in English

Course Code: - UHU-101

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L	T	P	Cr
3	0	2	4.0

UNIT I

Grammar and Reading skills:

1. Vocabulary building: parts of speech with usage, phraseology, idioms, one word substitution for a group of words, antonyms, synonyms.
2. Sentence formation, simple sentences of all six types.
3. Clauses.
4. Simple, Multiple and Compound sentences.
5. Verb Forms and Tenses.
6. Active Passive voice.
7. Narration.
8. Reading comprehension.
9. A text book containing short stories, plays and poems.
10. Newspaper reading.

UNIT II

Listening skills:

1. Familiarization with listening skills.
2. Phonetics: word accent, intonation.

UNIT III

Speaking skills:

1. Non Verbal Communications.
2. Phonetics: Consonants and vowel sounds, transcriptions, syllables.
3. Speech presentation, paper reading, extempore, self introduction.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

4. Dialogues, debates, role play and quizzes.
5. Group discussion, Interview skills.
6. Public speaking skills.

UNIT IV

Writing Skills:

1. Letter writing: personal, official and business and covering letters.
2. Resume' writing.
3. Essay writing.
4. Report writing.
5. Story writing.

Text Books:

1. An Exordium: Zeenat Khan & Akanksha Vashisht.
2. English Grammar: Murphy

Recommended Books:

1. English Grammar and Composition: Prof. M. Krishna swami.
2. Patterns of English structures: A.S. Hornby. (Macmillian publications recommended)
3. A text book of English Poems: stories & essays (Macmillian publications recommended)
4. High school English Grammar: Wren & Martin.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Language Lab

Course Code :- UHU-101

Evaluation Components for Practical Courses (Students are required to perform atleast 8 practicals mandatorily from the given list of practicals)	
Lab Performance	10
Lab file work	10
Viva – Voce	10
Total	**30**

1. Self-introduction with one's name, family background, place of residence, one's educational qualifications and experiences and defining one's career objective and projecting ones strengths and skill-sets.
2. Interview Skills: Students will participate in mock interviews.
3. Presentation skills: Students will make presentations on given topics.
4. Group Discussion; Students will participate in group discussions.
5. Phonetics: Stress & intonation- Ear Training- Correct pronunciation- Sound recognition exercise- common Errors in English.
6. Conversation: Face to Face Conversation – Telephone conversation- Role play activities (Student will take on roles and engage in conversation).
7. Reading comprehension and vocabulary.

   Filling in the blanks- vocabulary building –
   Reading and answering question – Newspaper reading
8. Listening comprehension: Students will be excerpts of different conversational recordings and questions based on the respective excerpts will be given to them.
9. Pronunciation Training: Through language lab software.
10. Remedial grammar exercises: Through language lab software.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Principles of Electronics Engineering

Course Code :- UEC-105

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L	T	P	Cr
3	1	2	4.5

UNIT-I

Brief review of Band Theory, Types of Semiconductors, Charge densities in semiconductor. Semiconductor Diode, Reverse and Forward bias conditions, Diode Characteristics and parameter, Equivalent circuit and frequency response, Ideal vs. Practical diode, Temperature Dependence of P-N junction diode, Diode Capacitance, Half and Full wave Rectifiers, Clipping and Clamping circuits, Avalanche diode, Zener Diode and its role as a voltage regulator.

UNIT-II

Bipolar junction transistor (BJT) and their I/P and O/P characteristics in CE, CB mode, Transistor as a switch, Temperature variation of saturation parameters, h parameters.JFET and MOSFET, Equivalent circuit, Enhancement mode and Depletion mode MOSFETS, Unijunction transistor (UJT), its characteristics, parameters and circuit operation, Photo transistor, its characteristics and applications.

UNIT-III

Bias for transistor amplifier: fixed bias, emitter feed back bias. Feedback principles. Types of feedback, Stabilization of gain, reduction of non-linear distortion, change in resistance by negative feedback in amplifier. Amplifiers coupling, types of coupling, Amplifier pass band, RC-Coupled amplifiers at mid, low and high frequencies.

UNIT-IV

Semiconductor processing, active and passive elements, Integrated circuits, bias for integrated circuits. Basic operational amplifier, applications of operational amplifier – adder, subtractor, Integrator, differentiator and comparator.

Text Books:

1. Electronic Principles: A.P.Malvino,TMH
2. Electronic Fundamentals and Applications: J.D. Ryder,PHI.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Reference Books:

1. Electronic Circuits & Devices: J.Millman & C.C.Halkias, TMH
2. Integrated Circuits & Devices: J.Millman & C.C.Halkias, TMH
3. Basic Electronic & Linear Circuits: N.N.Bhargava & Kulshrestha, TMH

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Principles of Electronics Engineering Lab
Course Code: - UEC-105

Evaluation Components for Practical Courses (Students are required to perform atleast 8 practicals mandatorily from thr given list of practicals)	
Lab Performance	10
Lab file work	10
Viva – Voce	10
Total	**30**

List of Experiments:

1. To study the use and scope of using an oscilloscope as a measuring device in an electronic laboratory.
2. To study the use and scope of using a multimeter (digital and analog) as a measuring device in an electronics laboratory.
3. To study the use and scope of function generator as a signal source in an electronics laboratory.

Set up an experiment to:

1. Draw forward bias and reverse bias characteristics of a p-n junction diode and use it as a half wave and full wave rectifier.
2. Draw the characteristics of a Zener diode and use it as a voltage regulator.
3. Draw characteristics of common base configuration of p-n-p transistor.
4. Draw characteristics of common emitter configuration of an npn transistor.
5. Draw characteristics of common drain configuration of a MOSFET.
6. Find the voltage and current gain of single stage common emitter amplifier.
7. Draw the characteristics curve of UJT.
8. Find the voltage gain of single stage voltage series feedback amplifier.
9. Use operational amplifier as:
   (a) Inverting amplifier
   (b) Non-inverting amplifier
   (c) Comparator
10. Use operational amplifier as:
    (a) Integrator
    (b) Differentiator
11. Use operational amplifier as:
    (a) Adder

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

(b) Precision amplifier

12. Find the overall voltage gain and current gain of a two stage RC coupled amplifier.

Emphasis is on system design and not on discrete components, some of the component around which exercises can be built are

1. SCR as triacs and power control.
2. Power supplies using zener.
3. Opto couplers and isolations where photo diode, transistors, leds are used.
4. Laser diode (laser pointer)
5. Operation amplifiers.
6. Operation amplifiers as instrumentation amplifiers.

Note: - Record to be maintained in the laboratory record book for evaluation. Usage of breadboard approach to be encouraged.

Text Books:

1. Basic Electronic & Linear Circuits: N.N.Bhargava & Kulshrestha, TMH
2. Electronic Devices & Circuit Theory: Robert L.Boylestad & Louis Nashelsky, Pearson Edu.

Reference Books :

1. Principles of Electronics: V.K. Mehta, S. Chand Publisher
2. Electronics Devices & Circuits: Millman Helkias, TMH.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Principles of Mechanical Engineering

Course Code :- UME-105

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L	T	P	Cr
3	1	2	4.5

UNIT-I

First Law of Thermodynamics

Basic concepts of thermodynamics, systems -open and closed, equilibrium, Heat and work Essence and corollaries of the first law, analytical expressions applicable to a process and cycle, internal energy, enthalpy and specific heats, first law analysis of steady flow, applications of steady flow energy equation to engineering devices.

Applications of first law of Thermodynamics

Closed and open systems, analysis of non-flow and flow processes for an ideal gas under constant volume (Isochoric), constant pressure (Isobaric), constant temperature (Isothermal), adiabatic and polytropic conditions. Analysis of free expansion and throttling processes. Representation of these processes on P-V charts and analysis of property changes and energy exchange (work and heat) during these processes.

UNIT-II

Second Law of Thermodynamics

Limitations of first law, various statements of second law and their equivalence, application of statements of second law to heat engine, heat pump and refrigerator. Philosophy of Carnot cycle and its consequences. Carnot theorem for heat engines and heat pump. Third law of thermodynamics.

I. C. engine –basic engine components and nomenclature working principles of 4S and 2S engines, comparison of SI and CI engine, classification of IC engines, applications of IC engines. Lubricating, cooling and Fuel Circuits.

Refrigeration and Air Conditioning: Vapor compression Refrigeration Cycles, working of domestic refrigerator, window type Air conditioner.

UNIT-III

Simple Stresses & Strains

Concept & types of Stresses and strains, Poisson's ratio, stresses and strain in simple and compound bars under axial loading, stress strain diagrams, Hooks law, Elastic constants. Numerical

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

problems. Automobile engineering- components of automobile- the basic structure- Frame, axles, Suspension, wheel {just an overview} transmission system (layout and brief description).

Shear Force and Bending Moments

Definitions, SF & BM diagrams for cantilevers, simply supported beams with or without over-hang and calculation of maximum BM and SF and the point of contra flexure under (i) concentrated loads, (ii) uniformly distributed loads Numerical Problems.

UNIT-IV

Bending Stresses in Beams

Bending Stresses in Beams with derivation of Bending equation and its application to beams of circular, rectangular

Torsion of Circular Members

Torsion of Solid and hollow circular shafts, Numerical Problems.

Fluid Machines: Impulse and reaction turbines construction and working of Pelton turbine, Francis turbine and Kaplan turbine, construction and working of centrifugal and reciprocating pumps.

Text Books:

1. Nag, P.K., "Engineering Thermodynamics": Tata McGraw – Hill, New Delhi.
2. Yadav, R., Thermal Science and Engineering: Central Publishing House, Allahabad.
3. Strength of Materials: G.H.Ryder – Third Edition in S I units 1969 Macmillan India.
4. Mechanics of Materials: Dr. Kirpal Singh, Standard Publishers Distributors, New Delhi.
5. Internal Combustion Engines: V Ganeshan (Second addition) Tata McGraw- Hill, NewDelhi.

Reference Books:

1. Strength of Materials: Popoy, PHI, New Delhi.
2. Strength of Materials: Sadhu Singh, Khanna Publications.
3. Strength of Materials: A Rudimentary Approach – M.A.Jayaram, Revised Ed. 2001, Sapna Book House, Bangalore.
4. Strength of Materials: U.C.Jindal.
5. Moran, M.J. and Shapiro, H.N., Fundamentals of Engineering Thermodynamics, John Wiley, New York.
6. Van Wylen: G.J., Fundamental of Classic Thermodynamics, John Wiley, New York.
7. Spalding, D.B. and Cole, E.H., Engineering Thermodynamics, ELBS, New Delhi.
8. Hibbeler, R.C. Engineering Mechanics – Statics, Addison Wesley Longman, New Delhi.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Principles of Mechanical Engineering Lab

Course Code :- UME-105

Evaluation Components for Practical Courses (Students are required to perform atleast 8 practicals mandatorily from the given list of practicals)	
Lab Performance	10
Lab file work	10
Viva – Voce	10
Total	**30**

List of Experiments:

1. To study low-pressure boilers.
2. To study High-pressure boilers.
3. Calibration of thermometers.
4. Calibration of pressure gauges.
5. Study of discharge measuring devices.
6. To determine co-efficient of discharge of orifice meter.
7. To verify the Bernoulli's Theorem.
8. To find Young's Modulus of Elasticity using Searl's apparatus.
9. To find Young's Modulus of Elasticity of a beam with deflection beam apparatus.
10. To find Modulus of rigidity with the help of torsion apparatus.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

SEMESTER III

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name :- Electronic Devices and Circuits

Course Code :- UEC-200

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L	T	P	Cr
3	1	2	4.5

UNIT - I

MULTISTAGE AMPLIFIERS

Mathematical Analysis, Construction and Working of PN Junction Diode and Transistor, General cascaded systems, RC Coupled amplifiers, Transformers coupled amplifiers, direct-coupled amplifiers, cascaded amplifiers, Darlington compound configuration and multistage frequency effects.

UNIT - II

HIGH FREQUENCY RESPONSE OF TRANSISTOR AMP.

High Freq. Model for CE amplifiers, approximate CE high freq. Model with resistive load CE short circuit gain. HF Current gain with resistive load.

LARGE SIGNAL AMPLIFIER

Analysis and design of Class A, B, AB amplifiers, Push pulls amplifiers, transformer less output stages, distortion calculations, high power amplifiers

Analysis and design of Class A, B, AB amplifiers, Push pulls amplifiers, transformer less output stages, distortion calculations, high power amplifiers.

UNIT – III

TUNED AMPLIFIERS

General bahaviour of tuned amplifiers, Resonance, Series and parallel resonant circuit, calculations of circuit impedance at resonance.Variation of impedance with frequency, Q-Factor of a circuit and coil. Bandwidth of a series and parallel resonant circuit advantage and disadvantage of tuned amplifiers, single tuned amplifiers, voltage gain and frequency response of single tuned amplifiers , double tuned amplifiers , Analysis and design of Class C amplifiers.

SINUSOIDAL OSCILLATORS

-Introduction to oscillators, oscillatory circuit & its operation, types of oscillator:-Colpits oscillator, RC phase shift oscillator, Clapp oscillator, Wein bridge oscillator,beat frequency oscillator, crystal oscillator, Hartley oscillator.

UNIT – IV

FEEDBACK AMPLIFIERS

Feedback concept, characteristics of negative and positive feedback, Effect on I/P & O/P impedances, gain freq. response and noise.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Text Books:

1. Electronic Devices and Circuit Theory: Boylstad & Naschelsky,Pearson Education.
2. Basic Electronic & Linear Circuits: N.N.Bhargava & Kulshrestha, TMH.

Reference Books:

1. Electronic circuits: Schilling and Belove, TMH
2. Electronic Devices & Circuits: Millman & Halkias, TMH

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Electronic Devices and Circuits Lab

Course Code :- UEC-200

Evaluation Components for Practical Courses (Students are required to perform at least 8 practicals mandatorily from the given list of practicals)	
Lab Performance	10
Lab file work	10
Viva – Voce	10
Total	**30**

List of Experiments*:*

1. To examine the amplifying action of CE transistor amplifier.
2. To determine the frequency response of a RC coupled common emitter amplifier.
3. To study frequency response of single tuned voltage amplifier.
   a) Inductively coupled.
   b) Capacitively coupled.
4. To study frequency response of Current Series Negative Feedback Amplifier.
5. To study frequency response of Voltage Shunt Negative Feedback Amplifier.
6. To study frequency response of Current Shunt Negative Feedback Amplifier.
7. To study performance of Class B Amplifier.
8. To study performance of Class C Amplifier.
9. To study the performance of Hartley & Colpitts Oscillators.
10. To study the performance of RC Phase Shift Oscillator.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Digital Electronics

Course Code :- UEC-201

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L	T	P	Cr
3	1	2	4.5

UNIT-I

Binary, octal & Hexadecimal number systems and their inter conversion. Binary arithmetic (Addition & Subtraction, Multiplication & Division), 1's & 2's complements, 9's & 10's complement, BCD code, BCD Addition, Gray Code, Error Detection and Correction , Hamming code.

UNIT-II

Logic functions (OR, AND, NOT, NAND, NOR, XOR), Elements of Boolean Algebra (Theorems truth tables and relations) Negative & Positive logic, Logic IC's, de Morgan's Theorem, minterms and maxterms. Karnaugh mapping, K-map representation of logical function for 2, 4,5 & 6 variable, simplification of Boolean equations with the help of K-map, Various minimization techniques, Quine's method and Quines Mc-Cluskey method, Half adder, full adder, half subtractor, full subtractor, serial and parallel binary adder.

UNIT-III

Introduction and performance criteria for logic families, various logic families - DCTL, RTL, DTL, TTL & EC working and their characteristics in brief, MOS Gates and CMOS Gates, comparison of various logic families.

UNIT-IV

Various kinds of Flip-Flop: RS Flip-Flop, Clocked RS Flip-Flop, Edge triggered D Flip-Flop, Flip-Flop Switching time, J/K Flip-Flop, JK Master Slave Flip flop. Shift registers: serial in serial out, serial in parallel out ,parallel in serial out, parallel in parallel out, Ring counters, asynchronous counters, synchronous counters. D/A Converter, A/D Converter, Multiplexers and Demultiplexer, Encoder and Decoder & their applications.

Text Books :

1. Digital Principles & Applications: Malvino and Leach, TMH.
2. Digital Integrated Electronics:Taub and Schilling, TMH.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Reference Books :

1. Digital Circuits and Logic Design: Samuel C Lee, PHI
2. Pulse, Digital and Switching Waveforms: Millman and Taub, TMH
3. Modern Digital Electronics: R.P.Jain, TMH
4. Digital Fundamentals: Floydd, Pearson Edu.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Digital Electronics Lab
Course Code :- UEC-201

Evaluation Components for Practical Courses (Students are required to perform atleast 8 practicals mandatorily from the given list of practicals)	
Lab Performance	10
Lab file work	10
Viva – Voce	10
Total	**30**

LIST OF EXPERIMENTS:

1. Verify truth tables of AND, OR, NOT, NAND, NOR and XOR gates.
2. Implement (i) half adder (ii) full adder using AND – OR gates.
3. Implement full adder using NAND gates as two level realizations.
4. Implement full subtractor using 8 to 1 multiplexer.
5. Verify truth tables of RS & JK flip flops and convert JK flip fops into D type & T type flip fops.
6. Realization of Gates (AND, OR, NOT) with discrete components.
    a) Use of 4-bit shift register for shift left and shift right operations.
    b) Use 4-bit shift register as a ring counter.
7. Implement mod – 10 counter and draw its output wave forms.
8. Implement 4-bit DAC using binary weighted resistance technique/R-2R ladder network technique.
9. Implement 8 – bit ADC using IC (ADC 0800/0801).

ADDITIONAL EXERCISES:

1. Construct bounce less switch.
2. Construct a pulse of 1 Hz and 10 Hz, 1k Hz and manual.
3. Construct logic state detector.
4. Construct opto – sensor based.
    (a) Measurement rotational speed of motor.
    (b) Measurement time elapse between two events.
    (c) Measurement of linear velocity.
    (d) Measurement of acceleration.
5. Construct a memory using TTL Circuits. Read and write data onto a memory from bus.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name :- Circuit Theory

Course Code :- UEC-202

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr
3 1 0 3.5

UNIT -I

LAPLACE TRANSFORMATION: Laplace transformation and its applications to circuit theory in obtaining steady state and transient response of linear circuit.

FOURIER ANALYSIS: Of complex waveform, solution of linear circuit impressed with complex waveform, power and power factor associated with complex wave.

UNIT- II

TWO PORT NETWORK

Network elements, classification of networks, symmetrical two port network, Equivalent T and π representation in parameter form, ladder and lattice networks, Parameter representation: Z parameter (open circuit impedance parameter), Y parameter (short circuit admittance parameter), Hybrid parameter (h- parameter representation), ABCD parameter representation, condition of reciprocity & symmetry in two port networks, different type of interconnection of two port network including series, parallel and cascade connection ,iterative and image impedances.

UNIT -III

ANALYSIS OF NETWORK USING GRAPH THEORY: Graph for given network, classification of graph and sub graphs, incidence , tie set and cut set matrices, terminology used in Network Graph, properties of tree in a graph, variable solution of network using graph theory and matrix from the concept of network function.

COUPLING CIRCUIT: Dot convention, coefficient of coupling, mutual inductances, loop and nodal equation for coupling circuits.

UNIT -IV

NETWORK SYNTHESIS: Driving point functions, P.R functions, properties of P.R functions, Hurwitz polynomials, properties of Hurwitz polynomial functions, synthesis of reactive network by Foster & Cauer's method: Form-I & Form-II for LC networks,Synthesis of RC network by Foster & Caurer Form.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Text Books:

1. Circuit Theory: Chakravorty, Dhanpat Rai & Sons
2. Network and Circuit: A.Sudhakar, Tata Mc Graw Hill.

Reference Books:

1. Network Analysis: M.E Valkenburg, PHI
2. Network Analysis: Sundaram Seshu, N Balbanian John, John Wiley & Sons
3. Network Analysis and Synthesis: D Roy Choudhary, New Age Sciences Ltd.
4. Circuit Analysis: Soni Gupta, Dhanpat Rai & sons
5. Network Analysis: Schaum Series.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Signals & Systems

Course Code :- UEC-203

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L	T	P	Cr
3	1	0	3.5

UNIT - I

REPRESENTATION OF FREQUENCY AND TIME DOMAIN: Introduction to Information, message and signals, classification of signals, discrete and continuous spectrum, power spectrum energy density spectrum, dirac-delta function, sampling theory and approximation, convolution, basic network analysis, typical networks, bandlimiting & timelimiting signals, transmission bandwidth requirements

UNIT - II

RANDOM SIGNAL THEORY: Discrete probability theory, continuous random variables, statistically independent random variable probability density functioning sums, transformation density function with discrete components, ergodic process, correlation function, spectral density with noise.

UNIT – III

NOISE: Atmospheric, thermal, shot and partition noise, figure and experimental determination of noise figure, shot noise in temperature-limited diode and space charge limited diodes, shot noise in triodes.

TRANSMISSION THROUGH NETWORK: Networks with random input, auto correlation, spectral density and probability density I/P – O/P relationship, equivalent noise band width.

UNIT - IV

BASIC INFORMATION THEORY : Definition of Information, Units of information, Entropy, Uncertainty and information rate of Communication, Redundancy, Relation between system capacity and information concept of message, discrete systems, discrete noisy channel, Continuous systems, comparison of existing system.

Text Books:

1. Communication Systems: G.Kennedy, TMH
2. Principles of Communication Systems: Taub & Schilling, TMH

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Reference Books:

1. Communication Systems: B.P.Lathi, Oxford University
2. Signals and Systems: S. Haykin., John Wiley
3. Elements of Communication Theory: J.C.Hancock., TMH
4. Modren Electronic comm.theory & systems: Ashok Raj,UMESH PUBLICATIONS

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Principles of Engg. Economics and Management

Course Code :- UMG-200

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr
3 1 2 4.5

UNIT- I

ECONOMICS
Definitions, Nature & scope of Economics, Economics Systems-meaning of Capitalism, Socialism & mixed economy.
DEMAND AND SUPPLIES ANALYSIS
Law of demand and supply, exception to the law of demand, Elasticity of demand and supply and their types, Methods of measuring elasticity of demand and supply.

UNIT- II
THEORY OF PRODUCTION
Scales of production, Law of returns, Break even analysis.
MONETARY SYSTEM
Monetary policy – Meaning, objectives, methods, Fiscal policy – Meaning & objectives of fiscal policy in a developing country like India, Functions of Reserve Bank of India and commercial banks.
ECONOMICS & BUSINESS ENVIRONMENT
Privatization –Growth of private capitalism in India, Business/Trade Cycles – Meaning, Characteristics & classification, foreign capital & economic development.

UNIT- III
MANAGEMENT PRINCIPLES
Meaning & types of Management, Concept of Scientific Management, Management By Objectives, System Approach to Management.
FINANCIAL MANAGEMENT
Meaning, functional areas of financial management, Sources of Finance, Meaning of financial accounting, accounting principles-concepts & conventions, Importance of final accounts – profit & loss a/c and balance sheet, Need and importance of capital budgeting.
MARKETING MANAGEMENT
Introduction to marketing management, Market segmentation, Developing & managing advertising programs, Deciding on media & measuring effectiveness.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

UNIT- IV

PRODUCTION MANAGEMENT

Procedure for production planning & Control, Plant Location & Lay-out, Routing, Scheduling, CPM & PERT,

QUALITY MANAGEMENT

Statistical Quality Control, Introduction to Six Sigma.

Control Charts, X Charts, R Charts, Control Charts for C (N. of defects per unit), Control chart for P (Fraction Defective), Advantages & Limitations of SQC

QUALITY CIRCLES: - Structure, functions & Limitations.

Text Books:

1. Business Organisation & Management: B.P.Singh & T.N.Chabra, Dhanpat Rai & Sons
2. Modern Economic Theory: K .K. Dewett, S.Chand & Co.

Reference Books:

1. Financial Management: I.M. Pandey, Vikas Publishing House
2. Production Operation Management: Dr. B.S. Goel, Pragati Prakashan
3. Indian Economic: Ruddar Dutt, S.Chand & Co

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Numerical Analysis & Computer Programming

Course Code: - UMA-201

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr
3 1 2 4.5

UNIT – I
INFINITE SERIES
Convergence, divergence and oscillation of an infinite series, comparison test, p-series, D'Alembert's ratio test, logarithmic, integral test (all test without proof) for series of positive terms

UNIT – II
NUMERICAL ANALYSIS
SOLUTION OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS
Bisection method, method of false position, secant method, Iteration method Newton-Raphson method, Generalized Newton-Raphson method.
SOLUTION OF SIMULTANEOUS ALGEBRAIC EQUATIONS
Jacobi's method, Gauss-Seidal method, relaxation method, fixed point iteration & its convergence, Eigen values by iteration – Power and Jacobi's Method.

UNIT – III
FINITE DIFFERENCES & INTERPOLATION
Forward and Backward difference operators. Newton's Forward and Backward interpolation formulae. Central Difference Interpolation formulae. Gauss's forward and Backward Interpolation formulae. Lagrange's interpolation formulae and Newton's Divided Difference formulae.
NUMERICAL DIFFERENTIATION AND INTEGRATION
Formulae for derivatives, Trapezoidal rule, Simpson's $1/3^{rd}$ and $3/8^{th}$ rules.

UNIT – IV
NUMERICAL METHODS TO SOLVE DIFFERENTIAL EQUATIONS
Solution of first order differential equations using Taylor's series, Euler's, Picard's and Runge Kutta method upto 4^{th} order, Predictor- Corrector methods (Adam's and Milne's method), Simultaneous differential equations of first order, differential equations of second order.

Text Books:

1. Numerical methods for scientific & Engineering Computations :M.K.Jain, Wiley eastern Ltd S.R.K.lyengar, R.K.Jain

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

2. Computer Oriented Numerical Methods: U.Rajaraman Orebtuce, PrenticeHall of India.

Reference books:

1) Introductionto Numerical Analysis : C.E. Froberg : Adison Wesley
2) Advanced Engg. Mathematics :Michael D. Greenberg, : Pearson Education

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Numerical Analysis & Computer Programming

Course Code: - UMA-201

Evaluation Components for Practical Courses (Students are required to perform atleast 8 practicals mandatorily from the given list of practicals)	
Lab Performance	10
Lab file work	10
Viva – Voce	10
Total	**30**

List of Practicals:

Write down and execute following programs using C/C++ language

1. To find the roots of non-linear equation using Bisection method/Muller's method.
2. To find the roots of non-linear equation using Newton's method/Muller's method.
3. Curve fitting by least-squares approximations.
4. To solve the system of linear equations using Gauss-Elimination method.
5. To solve the system of linear equations using Gauss-Seidal iteration method.
6. To solve the system of linear equations using Gauss-Jordan method.
7. To solve integral equation numerically using Trapezoidal rule.
8. To solve integral equation numerically using Simpson's rule.
9. Find the largest Eigen value of a matrix by power – method.
10. To find numerical solution of ordinary differential equations by Euler's method.
11. To find numerical solution of ordinary differential equations by Runga-Kutta method.
12. To find numerical solution of partial differential equation/laplace equation/ wave equation/heat equation.
13. To find numerical solution of ordinary differential equations by Milne's method.
14. To solve a given problem using Newton's forward interpolation formula.
15. To solve a given problem using Lagrange's forward interpolation formula.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - MATLAB

Course Code :- UEC-204

Evaluation Components for Practical Courses (Students are required to perform at least 8 practicals mandatorily from the given list of practicals)	
Lab Performance	10
Lab file work	10
Viva – Voce	10
Total	**30**

L	**T**	**P**	**Cr**
0	**0**	**2**	**1.0**

List of Experiments:

1. Study different tool box available in MATLAB.
2. Roots of a quadratic equation.
3. Factorial Program
4. Write a code snippet using a for loop that creates a sine wave whose frequency increments from 0 to 1 Hz over 5 seconds. Turn in the code and a plot.
5. Simulation of an RC circuit.
6. Study different mathematical functions available in MATLAB.
7. I-V characteristic of a MOSFET.
8. Finding average with a dynamic array.
9. Writing and Reading a binary file.
10. Plotting multiples graphs for compression.
11. Plotting one and two-dimensional graphs using various MATLAB 2-D Plot types.
12. Calculator design using MATLAB GUI.
    - Software used: MAT LAB 7.0

Reference Books:

1. Programming in MATLAB: Marc E.Herniter, Thomson ASIA Ptc Ltd.
2. MATLAB: Duane C. Hanselman, Math Works, Inc Bruce Littlefield

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

SEMESTER IV

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Electronic Logic Circuit Design

Course Code: - UEC-250

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr
3 1 2 4.5

UNIT – I

INTRODUCTION
The switching circuit, classification of switching circuits.
SEQUENTIAL CIRCUITS
Asynchronous and synchronous circuits, state diagram and state table.
SEQUENTIAL LOGIC DESIGN:
Introduction, register, application of shift register, ripple or asynchronous counters, synchronous counters, up down counters, modulo counters, Decade counter. Design of counters (Binary & non-Binary)

UNIT – II
SYNCHRONOUS SEQUENTIAL CIRCUIT DESIGN: Sequential circuits, introductory example, finite state model – Basic definition, capabilities and limitation of finite state machines, state equivalence & machine minimization, simplification of incompletely specified machines, Extraction of maximal compatibles, synthesis & analysis of synchronous sequential circuits.

UNIT – III
DESIGN OF ASYNCHRONOUS SEQUENTIAL CIRCUITS:
Introduction to asynchronous circuits, timing diagram, state diagram & flow tables, fundamental mode circuits, synthesis, state assignment in asynchronous sequential circuits, pulse mode circuits.

UNIT – IV
HAZARDS:
Introduction, gate delays, generation of spikes, production of static hazards in combinational networks, elimination of static hazards, design of hazard free combinational networks, hazard free asynchronous circuit design, dynamic hazards, essential hazards.

Text Books: An Engineering Approach to Digital Design, Fletcher, Pearson Education

REFRENCE BOOKS:
1. Switching and finite automata theory: ZVI Kohavi, Tata Mcgraw-Hill
2. Logical design of switching circuits: Douglas Lewin
3. Digital Design: Morris Mano, Pearson publication

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Electronic Logic Circuit Design Lab

Course Code: - UEC-250

Evaluation Components for Practical Courses (Students are required to perform at least 8 practicals mandatorily from the given list of practicals)	
Lab Performance	10
Lab file work	10
Viva – Voce	10
Total	**30**

L T P Cr
3 1 2 4.5

LIST OF EXPERIMENTS:

1. Familiarization with electronic circuit simulation tool.
2. Design a full wave rectifier.
3. Design a full wave bridge rectifier.
4. Design a Voltage regulator using Zener diode.
5. Design a common emitter single stage amplifier.
6. Verify the operations of OR, AND, NOT, NOR, NAND and XOR gates.
7. Design a ring counter and twisted ring counter.
8. Design a mod – 8 up and down counter.
9. Design a square wave generator using IC555 timer.
10. Design a biased diode clipper.

Software used: - Multisim-10/ PSPICE

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Control System Engineering
Course Code: - UEC-251

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr
3 1 2 4.5

UNIT – I

INTRODUCTION
The control system, historical development of automatic control system, sampled data digital control system.
MATHEMATICAL MODELS OF PHYSICAL SYSTEMS
Differential equation of physical systems, transfer function, block diagram algebra, signal Flow graphs.
FEEDBACK CHARACTERISTICS OF CONTROL SYSTEMS
Feedback and Non-feedback systems, Reduction of parameter variations by use of feedback, control over system Dynamics by use of feedback, control of the effects of Disturbance signals by use of feedback.

UNIT – II
TIME RESPONSE ANALYSIS
Transient and steady state response, Input Test Signals, Time response of a first order and second order control systems, Steady State Error, Control Actions.
STABILITY
The concept of stability, Necessary conditions for stability, Routh – Hurtwitz stability criterion.
ROOT LOCUS TECHNIQUE
The Root Locus concept, construction of root loci.

UNIT – III
FREQUENCY RESPONSE ANALYSIS
Correlation between Time and Frequency Response, Polar plots, Bode plots,
STABILITY IN FREQUENCY DOMAIN
Nyquist stability Criterion, Assessment of Relative Stability using Nyquist Criterion,

UNIT – IV
COMPENSATION OF CONTROL SYSTEMS
Phase lead compensation, phase lag compensation, phase lag – lead compensation, Feedback compensation.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

UNIT – V

STATE VARIABLE ANALYSIS:
State space Representation, the concept of state, State space Representation of Systems, Block diagram for state equation, controllability, observability.

Text Books:

1. Control Systems Engineering: Nagrath & Gopal, New Age International.

Reference books:

2. Linear Control system: B.S. Manke
3. A Text of Control system Engg., I.J. Nagrath, New Age International
4. Control System Engineering: S. Panda, S. Padhy, S.K. Kataria & Sons.
5. Control System Design: An Introduction to state space methods, Bernard Friedland.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Control System Lab

Course Code: - UEC-251

Evaluation Components for Practical Courses (Students are required to perform at least 8 practicals mandatorily from the given list of practicals)	
Lab Performance	10
Lab file work	10
Viva – Voce	10
Total	**30**

LIST OF EXPERIMENTS:

1. To illustrate a simple motor driven open loop position control system.
2. To demonstrate simple motor driven closed loop position control system.
3. To study and demonstrate simple closed loop speed control system.
4. To study the lag compensator and to draw magnitude and phase plots for these.
5. To draw the magnitude and phase plots for lead and lag-lead compensators.
6. To study a stepper motor and to execute microprocessor or computer based control of the same by changing number of steps, direction of rotation and speed.
7. To plot torque – speed characteristics of ac servomotor.
8. To plot torque – speed characteristics of dc servomotor.
9. To study magnetic amplifier.
10. To study synchro transmitter rotor position vs. stator voltages and the working of synchro reciever position.
11. To study second order system and obtain its time response for different damping factors.

Course Name: - Analog Communication

Course Code: - UEC-252

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr
3 1 0 3.5

UNIT – I

BASE BAND SIGNALS AND SYSTEMS
Introduction, Definition of Communication, Communication System Block Diagram, Need for Wireless Communication, Need of Modulation, General Definition of Modulation, types of various signals, Basic Transmission signals.

AM TRANSMISSION AND RECEPTION
Analog Modulation:-
Theory, power & current calculation, AM modulation of a complex wave.
AM Transmission:-
Introduction, Generation of Amplitude Modulation, Low Level and High Level Modulation. Basic Principle of AM Generation; Square Law Diode Modulation, Amplitude Modulation in Amplifier Circuits, Vander Bijl Modulation, Suppressed Carrier AM Generation (Balanced Modulator), Ring Modulator, High Power Linear Modulators.
AM Reception:-
Tuned Radio Frequency (TRF) Receiver, Super hetrodyne Receiver, Basic Elements of AM Super-hetrodyne Receiver, RF Amplifier, Neutralization of RF Amplifiers, Class of operation of RF Amplifiers, High power RF Amplifiers, Image Frequency Rejection, Cascade RF Amplifiers, Methods of increasing Bandwidth, Frequency conversion and Mixers, Additive Mixing, Bipolar Transistor Additive Mixer, Self Excited Additive Mixers, Multiplicative Mixing, Multiplicative Mixer using Dual Gate MOSFET, Tracking and Alignment, IF Amplifier, AM Detector, Square Law Detector, Envelope or Diode Detector, AM Detector with AGC, Distortion in Diode Detectors, AM Detector Circuit using Transistor, Double hetro-dyne Receiver, AM receiver using a Phase Locked Loop (PLL), AM receiver characteristics.

UNIT-II
FM TRANSMISSION AND RECEPTION
Frequency Modulation: Theory of FM, Mathematical Analysis of FM, Spectra of FM signals, Narrow/Wide Band FM.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

FM Transmission: FM Allocation Standards, Generation of FM by Direct Method, Varactor Diode Modulator, Indirect Generation of FM, The Armstrong Method, RC Phase Shift Method, Frequency Stablized Reactance Modulator, FM Transmitter, FM Stereo Transmitter.
FM Reception: Direct Methods of Frequency Demodulation, Travis Detector/Frequency Discrimination (Balanced slope Detector), Foster Seely or Phase Discriminator, Ratio Detector, Indirect Method of FM Demodulation, FM Detector using PLL, Zero Crossing Detector as a Frequency Demodulator, Pre-emphasis and De-emphasis, Limiters, The FM Receiver, RF Amplifier, FM Stereo Receiver, Transceiver.

UNIT-III
Theory of Phase modulation, Comparison of AM & FM, Comparison of PM & FM, SSB Transmission and Reception.
SSB Transmission: Introduction, Advantages of SSB Transmission, Generation of SSB, The Filter method, The Phase – shift Method, The Third Method, AM Compatible SSB Modulation, Pilot Carrier SSB, Independent Side-band systems (ISB), Vestigial Side-band (CSSB) Receiver, ISB/Suppressed Carrier Receiver.

UNIT-IV
PULSE MODULATION TRANSMISSION AND RECEPTION:
Introduction, Pulse amplitude Modulation (PAM), Natural PAM, Frequency spectra for PAM, PAM Time Multiplexing, Flat-top PAM, PAM Modulator Circuit, Demodulation of PAM Signals, Pulse Time Modulation (PTM), Pulse Width Modulation (PWM), Pulse Position Modulation (PPM), PPM Demodulator.

Text Books:

1. Modern Communication Theory: Sharma & Sinha, Dhanpat Rai & sons
2. Communication Systems: Taub & Schilling, TMH.

Reference Books:

1. Electronic Communication systems: George Kennedy, TMH.
2. Modern Electronic Communication: Ashok Raj, Umesh Publication.
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Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Analog Communication Lab

Course Code:-UEC-252

Evaluation Components for Practical Courses (Students are required to perform atleast 8 practicals mandatorily from the given list of practicals)	
Lab Performance	10
Lab file work	10
Viva – Voce	10
Total	30

LIST OF EXPERIMENTS:

1. Analysis of Amplitude Modulation and Demodulation Techniques, also calculate modulation index.
2. Analysis of Frequency Modulation and Demodulation Techniques, also calculate depth of modulation.
3. To study the operation of a single mode band transmission system.
4. To generate the DSB-SC signal using balanced Modulator.
5. To study the function of a super heterodyne receiver.
6. To detect the FM signal using phased lock loop.
7. To generate the PAM, PWM, PPM signals using experimental boards.
8. To observe the frequency response for vestigial side band transmission system.
9. To implement and study the functioning of Pre-emphasis & De-emphasis circuits.
10. To detect the audio signal using FM Radio Receiver.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Linear Integrated Circuits & Application

Course Code: - UEC-253

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr
3 1 2 4.5

UNIT- I

DIFFERENTIAL AND CASCADE AMPLIFIERS: Balanced, unbalanced output differential amplifiers, FET differential amplifier, current mirrors, level Translators, cascade configuration of amplifiers, operational amplifiers, Introduction to ideal OP-AMP, characteristic parameters, Practical OP-AMP, its equivalent circuit and op-amp circuit configurations.

UNIT- II

OP-AMP WITH NEGATIVE FEEDBACK AND FREQUENCY RESPONSE: Block diagram representation of feedback amplifier, voltage series feedback, voltage shunt feedback differential amplifiers, frequency response compensating network, frequency response of internally compensative op-amp and non-compensating op-amp. High frequency op-amp equivalent circuit, open loop gain V/s frequency, closed loop frequency response, circuit stability and slew rate.

UNIT- III

OP-AMP APPLICATION: DC, AC amplifiers, peaking amplifier, summing, scaling, averaging and instrumentation amplifier, differential input output amplifier, voltage to current converter, current to voltage converter, very high input impedance circuit, integration and differential circuit, wave shaping circuit, active filters, oscillators.

UNIT- IV

SPECIALIZED LINER IC APPLICATIONS: 555 timers IC (monostable & astable operation) & its applications, Universal active filter, PLL, power amplifier. Basic comparator & its characteristics, zero crossing detector, voltage limiters, clippers & clampers, small signal half wave & full wave rectifiers.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Text Books :

1. R.A. Gayakwad: OP-amps and Linear Integrated circuits, PHI.

Reference Books:

1. K.R.Botkar: Integrated circuits, Khanna Publisher
2. Linear Integrated Circuits: D. Roy & B. Jain, New Age International Publication.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Linear Integrated Circuits & Applications Lab

Course Code: - UEC-253

Evaluation Components for Practical Courses (Students are required to perform atleast 8 practicals mandatorily from the given list of practicals)	
Lab Performance	10
Lab file work	10
Viva – Voce	10
Total	**30**

LIST OF EXPERIMENTS:

1. (a) Design of Differentiator to differentiate a input signal that varies in frequency from 10 Hz to 1KHz
   (b) Design a Integrator circuit to process input sinusoidal Wave forms 10 Hz to 1 KHz by input amplitude is 10 mV

2. (a) Design a Second order LPF at a high cut off frequency of 1 KHz.
   (b) Design a Second order HPF cut off filter of 1 KHz with a pass band gain of 2

3. (a) Design a wideband pass filter with FL=200 KHz and FH=1KHz and a pass band gain Of 4
   (b) Design a 60 Hz active notch filter.

4. Design a square wave generator using 555 timer.
5. Design a R.C. phase shift Oscillator using 741 IC
6. Design a Wien bridge oscillator using 741 IC
7. Design wave shaping circuit using operational amplifier.
8. Design a current to voltage converter using operational amplifier.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Computer Architecture

Course Code:-UEC-254

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr
3 1 0 3.5

UNIT-I

Basic structure of computer hardware and software: Addressing methods and machine program sequencing, Computer arithmetic, logic design and fast adders, multiplication, Booth's algorithm, Fast multiplication, integer division, floating point numbers, Control unit - instruction execution cycle, sequencing of control signals, hardwired control, PLAs, micro programmed control, control signals, microinstructions, micro program sequencing, Branch address modification, Prefetching of microinstructions, emulation-Bit-slice processors

UNIT-II

Memory organization: Semiconductor RAM memories-internal organization, Bipolar and MOS devices, Dynamic memories, multiple memory modules and interleaving, cache memories, mapping functions, replacement algorithms, virtual memory , address translations, page tables memory management units, Secondary memory: disk drives - organization and operations - different standards .

UNIT-III

Input-output organizations: accessing I/O devices, direct memory access (DMA), interrupts - interrupt handling, handling multiple devices, device identification, vectored interrupts , interrupt nesting, Daisy chaining, I/O interfaces, serial and parallel standards, buses – scheduling, bus arbitration, computer peripherals – printers, plotters, VDUs .

UNIT-IV

Pipelining: Introduction, The Basic pipeline for DLX, the major hurdle of pipelining – pipeline hazards, Difficulties in implementing pipelining.
Instruction – level parallelism: Concepts and challenges, overcoming Data Hazards with dynamic scheduling.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Text Books:

1. Computer Organization: Hamacher C V, McGraw Hill
2. Computer System Architecture: Morris Mano, Pearson education.

Reference Books:

1. Computer Organization and Design, Pal Chaudhary, Prentice Hall
2. Digital Computer Fundamentals: Bartee T C, McGraw Hill
3. Computer Organization and Architecture: Hayes J P, Mc Graw Hill
4. Structured Computer Organization: Tanenbaum A S, Prentice Hall
5. Microprocessors Architecture Programming and Applications: Ramakant Goank, John Wiley

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Operating System

Course Code :- UCS-252

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr
3 1 2 4.5

UNIT-I

Introduction to Operating System: Simple Batch Systems; Multiprogrammed Batched Systems; Time-Sharing System; Personal-Computer System; Parallel System; Distributed System; Real-Time Operating Systems. System Components System Calls, System Programs; System Structure, Virtual Machines.
Process concept: Process Scheduling; Operation on processes, Cooperating Processes, Threads, Interprocess Communication.
CPU Scheduling concepts: Scheduling Criteria; Scheduling Algorithms; Multi-processor Scheduling; Real Time Scheduling.
Threads: Overview; Multithreading.

UNIT-II

Deadlocks: Deadlock Characterization, Methods of Handling Deadlock, deadlock Prevention; Deadlock Avoidance; Deadlock Detection, Recovery from deadlock;
Protection: Goals of protection; Domain of protection;
Security: The Security Problem; Authentication; One Time passwords, program Threats, System Threats;

UNIT-III

Memory Management: Logical Versus Physical Address Space, Swapping, Contiguous Allocation; Paging; Segmentation; Segmentation with paging. Virtual Memory; Demand Paging Performance of Demand Paging, Page Replacement Algorithms; Allocation of Frames, Cache memory and implementation. Secondary Storage Structure: Disk Structure; Disk Scheduling; Disk Management; Swap-space management.

UNIT-IV

File System Interface; File Concept; Access Methods; Directory Structure; Protection; Consistency Semantics.

File System Implementation; File System Structure; Allocation Methods, Free Space Management Directory Implementation; Efficiency and Performance; Recovery.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Text Books

1. Operating System Concepts- 5th Edition: Abrahanm, John Wiley & Sons,Inc. Silberschatz, Peter Baer Galvin

Reference Books:-

1. Introduction to Operating System-Tanenbaum, TMH.
2 An Introduction to Operating System: Detail H. M, Addison Wesley Publishing Company.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Operating System Lab

Course Code :- UCS-252

Evaluation Components for Practical Courses (Students are required to perform atleast 8 practicals mandatorily from the given list of practicals)	
Lab Performance	10
Lab file work	10
Viva – Voce	10
Total	**30**

LIST OF EXPERIMENTS:

1. Study of DOS internal commands.
2. Study of DOS external commands.
3. Writing of Batch files in DOS.
4. Study of GUI features of Windows Operating Systems.
5. Study various settings in Windows Operating Systems (Desktop settings, control panel etc.).
6. Study of LINUX Operating systems (LINUX basic commands).
7. Study of LINUX kernel.
8. Writing of Shell Scripts in LINUX.

Software used: - DOS, Linux

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

SEMESTER V

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: -Microprocessors & Applications

Course Code:-UEC-300

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr
3 1 2 4.5

Unit-I
Introduction: Evolution of microprocessor, General Architecture, resistors, ALU, System buses, Instruction cycle, fetch cycle, execute cycle, machine cycle, T states, Architecture of 8085, block diagram, pin diagram, instruction formats. Addressing Modes: Direct addressing, indirect addressing, register direct, register indirect, implicit addressing mode.

Unit-II
8085 MICROPROCESSOR Instruction Set & Programming: Typical instruction set of 8085, data manipulation, data transfer, status management instructions, Development of Assembly language program. Interrupts & data transfer: Interrupts: Hardware & Software Interrupts, polled and vectored interrupts, level and edge triggered interrupts, enabling, disabling and masking of interrupts. Data transfer schemes: DMA, memory mapped, I/o, mapped, schemes of I/o interfacing, Interfacing of RAM, ROM Chips with a microprocessor, concept of wait states.

Unit-III
8086 MICROPROCESSOR Introduction: Architecture, block diagram of 8086, details of sub-blocks such as EU, BIU; memory segmentation and physical address computations, program relocation, addressing modes, instruction formats, pin diagram and description of various signals.

Unit-IV
Instruction Set of 8086: Instruction execution timing, assembler instruction format, data transfer instructions, arithmetic instructions, branch instructions, looping instructions, NOP and HLT instructions, flag manipulation instructions, logical instructions, shift and rotate instructions, directives and operators, programming examples.
Peripheral devices & applications of microprocessor: The 8255 PPI chip: Architecture, control words, modes and examples, Introduction to DMA process, 8237 DMA controller.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Text Books:

1. Microprocessor & Architecture, programming and application: Gaonkar Wiley Eastern Ltd
2. Fundamentals of microprocessor & microcomputers: B.Ram, Kalyani Publishers.

Reference Books:

1. An introduction to microprocessor: A.P.Mathur, TMH
2. The Intel Microprocessors 8086- Pentium processor Brey: PRENTICE HALL OF INDIA
3.Microprocessors and interfacing: DV Hall, TMH

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name :- Microprocessor Theory Lab

Course Code: - UEC-300

Evaluation Components for Practical Courses (Students are required to perform atleast 8 practicals mandatorily from the given list of practicals)	
Lab Performance	10
Lab file work	10
Viva – Voce	10
Total	**30**

LIST OF PRACTICALS:

1. Study of 8085 Microprocessor Trainer kit.
2. Write a program using 8085 for
   (a) 8 bit two numbers addition.
   (b) 16 bit two numbers addition.
3. Write a program using 8085 for
   (a) Two 8 bit numbers subtraction.
   (b) Two 16 bit numbers subtraction
4. Write a program for multiplication of two 8 bit numbers using 8085.
5. Write a program for division of two 8 bit numbers division using 8085
6. Write a program for sorting a list of numbers in ascending & descending order.
7. Write a program for finding square of a number using look up table & verify
8. Study of 8086 Microprocessor kit.
9. Write a program using 8086 for division.
10. Write a program using 8086 for:
    (a) Finding largest number from an array
    (b) Finding smallest number from an array
11. Write a program to calculate the number of bits in a string.
12. Write a program to convert data string into its 2's complement form.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name:-Microelectronics

Course Code:-UEC-301

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

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3 1 0 3.5

UNIT – I
Crystal Growth: MGS, EGS, Czochralspi crystal Puller, Silicon shaping, Wafer Preparation.
Oxidation: Thermal Oxidation Kinetics, Oxidation Techniques, Oxide Properties, Oxidation induced effects. Thin film deposition techniques: Epitaxy, VDE, CVD, PECVD, MOCVD, PVD, Sputtering, MBE and epitaxial layer evaluations.

UNIT – II
Litho Graphy, Photolithography, E-beam lithography, X-ray Lithography, reactive Plasma Etching, Plasma Properties, Feature Size control and anisotropic etching, Plasma etching techniques and equipment.

UNIT – III
Diffusion : A Qualitative view of atomic diffusion in Solids, diffusion mechanisms, Fick's one dimensional diffusion equation, constant source and limited source diffusion, Diffusion of Grp3 and 5 impurities in Silicon Impurity Sources, diffusion apparatus, Characterization of diffused layers. Ion Implantation: Introduction, Range Theory, Implantation Equipment Annealing

UNIT – IV
Isolation Techniques, Bipolar IC fabrication Process Sequence, N-MOS IC fabrication Process Sequence. C-MOS IC fabrication Process Sequence .Assembly & Packaging: Package Types, design considerations, Package fabrication technologies, Future trends reference to MEMS packaging.

Text & Reference Books:

1. VLSI Technology: S.M.Sze, Mc Graw Hill.
2. VLSI Fabrication Principles: S.K.Ghandhi, Wiley-Interscience

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Digital Communication

Course Code: - UEC-302

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr
3 1 2 4.5

UNIT-I

PULSE MODULATION:- Sampling process, pulse – amplitude modulation , other forms of pulse modulation, Bandwidth – noise trade off, quantization process, pulse code modulation, noise considerations in PCM system, ISI & Eye pattern in PCM, Time- division multiplexing, digital multiplexers, differential pulse code modulation , delta modulation, Adaptive Delta Modulation.

UNIT-II

DIGITAL MODULATION TECHNIQUES: - Binary phase – shift keying, differential phase shift keying, differentially – encoding PSK (DEPSK), Quadrature phase shift keying (QPSK), M-ary PSK, Amplitude shift keying(ASK), Quadrature amplitude shift keying (QASK). Binary frequency shift keying, similarity of BFSK and BPSK, M-ary FSK, Minimum shift keying (MSK)

UNIT-III

DATA TRANSMISSION: - A base band signal receiver, probability of error, the optimum filter, white noise: the matched filter, probability of error of the matched filter, coherent reception: correlation, phase shift keying (PSK), frequency shift keying (FSK), Non coherent detection of FSK, differential PSK,).

UNIT-I V

SPREAD SPECTRUM MODULATION: - Pseudo-noise sequences, direct sequence spread spectrum, processing gain, frequency HOP spread spectrum, Linear Block Codes, Convolution codes.

Text Books:

1. Communication System: Simon Haykin, John Wiley
2. Principles of Communication System: Taub and Schilling, TMH.

Reference Books :

1. Electronics Communication System: Wayne Tomasi, Pearson Edu.
2. Information Theory Coding and Cryptography: Ranjan Bose, TMH
3. Communication Systems Analog and Digital: Sanjay Sharma, Katson Books

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Digital Communication Lab

Course Code :- UEC-302

Evaluation Components for Practical Courses (Students are required to perform atleast 8 practicals mandatorily from the given list of practicals)	
Lab Performance	10
Lab file work	10
Viva – Voce	10
Total	**30**

LIST OF EXPERIMENTS:

1. To obtain the signal sampling and to reconstruct it back into analog signal.
2. Obtain the signal using Pulse Code Modulation technique.
3. To study Delta Modulation and De-Modulation.
4. Determine the output signal using Adaptive Delta Modulation and De-Modulation.
5. To study Delta Sigma Modulation and De-Modulation.
6. Transmit & receive the signals using Time Division Multiplexing (PAM) technique.
7. Transmit & receive the signals using Time Division Multiplexing (PCM) technique.
8. To observe the waveform on C.R.O using Amplitude shift Keying.
9. To observe the waveform on C.R.O using Phase shift Keying.
10. Obtain the waveform using Frequency shift keying.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Field Theory

Course Code :- UEC-251

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr
3 1 2 4.5

UNIT-I
INTRODUCTION
Review of vector analysis, Scalar and Vector product, gradient, divergence, curl and their physical interpretation, line integral, surface integral, volume integral, stokes theorem, rectangular, cylindrical and spherical co-ordinate system and their transformations.

UNIT-II
ELECTROSTATICS: Coulomb's Law electrostatic force, Electric field intensity, Electric potential, Electric potential difference, Electric dipole and equipotential surfaces, Electric flux density, displacement flux, Gauss's Law, Capacitance and Capacitors, electrostatic energy.
MAGNETOSTATICS: Inductors and magnetic inductance, back emf, law of EM induction, Amperes law in differential vector form, Magnetic scalar & vector potential, self & mutual inductance, equation of continuity for steady currents, magnetic field intensity (H), Magnetic flux density (B), ampere force law (Biot Savart Law), energy stored in magnetic field.

UNIT-III
TIME VARYING FIELDS: Equation of continuity for time varying fields, inconsistency of amperes law, displacement current, Maxwell field equation in differential & integral form and their interpretation, uniform plane wave and relation between E and H in uniform plane wave, Intrinsic impedance, boundary conditions.
EM WAVES: Wave equation for free space and conducting medium, phasor on exponential notation of Maxwell's equations, wave propagation in free space and lossy dielectric medium, conductors 7 dielectrics, wave propagation in good dielectrics and good conductors, depth of penetration, reflection & refraction of plane waves at surface of perfect conductor and dielectric (both normal & oblique incidence), surface impedance, energy flow and Poynting theorem.

UNIT-IV
TRANSMISSION LINE THEORY: Transmission line as a distributed circuit, basic transmission line equation , equation of transmission line terminated with any load impedance, infinite transmitssion line, characteristic impedance, open & short circuited line, Reflection coefficient, standing wave ratio and its relation with reflection coefficient, impedance matching.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Text Books:

1. Engineering Electromagnetic: Hayt, TMH
2. Electro-Magnetic: Krauss JDF, Mc Graw Hill

Reference Books :

1. Antenna and wave propagation: K. D. Prasad, Satya Parkash
2. Electro-magnetic Waves and radiating Power: Jordan & Balmain, PHI

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Electronics Measurement & Measuring Instruments

Course Code: - UEC-304

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr
3 1 2 4.5

UNIT – I

UNIT, DIMENSIONS & STANDARDS: Scientific notations and metric prefixes.SI electrical units, SI temperature scales, Other unit systems, dimension and standards. Measurement Errors: Gross error, systematic error, absolute error and relative error, accuracy, precision, resolution and significant figures, Measurement error combination, basics of statistical analysis.

ELECTRONIC INSTRUMENTS: Electronic voltmeter, VTVM, Transistor voltmeter, Digital voltmeter systems, Electronic Multi-meter, digital multi-meters, measurement of resistance, inductance, capacitance, using Kelvin's Maxwell's and Schering Bridge. Effective resistance at high frequency, Q meters, LCR meter.

UNIT – II

INSTRUMENTS FOR GENERATION AND ANALYSIS OF WAVEFORMS: Signal generators, function generator, wave analyzer, harmonic distortion analyzer, spectrum analyzer, spectrum analysis.

CRO: CRT, wave form display, time base, dual trace oscilloscope, measurement of voltage, frequency and phase by CRO, Oscilloscope probes, Oscilloscope specifications and performance. Delay time based Oscilloscopes, Sampling Oscilloscope, DSO, DSO applications.

UNIT – III

TRANSDUCERS: Principles of operation, qualitative treatment of strain gauge, LVDT, thermocouple, piezo-electric crystal and photoelectric transducers.

DATA ACQUISITION SYSTEM: Necessity of recorders, Recording Requirements, Graphic Recorders, Strip chart Recorders, Magnetic tape Recorders, Digital Tape Recorders.

UNIT – IV

DISPLAY DEVICES: Electronic Indicating Instruments, seven segment display, Fourteen segmental display, Nixie tube.

TELEMETERY: Introduction, Method of data transmission, Types of Telementary Systems and applications.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Text Books:

1. Electrical and Electronic Measurements & Instrumentation: A.K.Sawhney, Dhanpat Rai &sons
2. Electronic Measurements & Instrumentation: J.B.Gupta, Katson Books.

Reference Books:

1 Electronic Instrumentation and Measurement Techniques: D.Cooper, PHI
2. Electronics Measurement: Terman & Petit, TMH

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Electronic Measurement & Measuring Instruments Lab

Course Code: - UEC-304

Evaluation Components for Practical Courses (Students are required to perform atleast 8 practicals mandatorily from the given list of practicals)	
Lab Performance	10
Lab file work	10
Viva – Voce	10
Total	**30**

LIST OF EXPERIMENTS:

1. Determination of frequency & phase angle using C.R.O.
2. Measurement of displacement using LVDT.
3. Measurement of distance using LDR.
4. Measurement of temperature using R.T.D.
5. Measurement of temperature using Thermocouple.
6. Measurement of pressure using Strain Gauge.
7. Measurement of pressure using Piezo – Electric Pick up.
8. Measurement of distance using Capacitive Pick up.
9. Measurement of distance using inductive.
10. Measurement of speed of DC Motor using Photo Electric Pick up.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name :- Virtual Instrumentation Lab

Course Code :- UEC-305

Evaluation Components for Practical Courses (Students are required to perform atleast 8 practicals mandatorily from thr given list of practicals)	
Lab Performance	10
Lab file work	10
Viva – Voce	10
Total	**30**

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LIST OF EXPERIMENTS:

1. Develop a VI program to perform various arithmetic & Binary Operation.
2. Build a VI program to compute the equation $y=x^3+2x^2+5x+7$ ($o<x<10$).
3. Build a VI program using while loop that displays random numbers (0-10) in to waveform charts.
4. Build a VI program measure the power spectrum and various other parameters of signal captured by DAQ card and NI ELVIS.
5. Develop a VI program to generate a voltage in LAB VIEW and verify output using a multimeter.
6. Develop a VI program for four function calculator. Use a Menu Ring to select the function required.
7. Develop a VI program to design various Basic Electronic Circuits.
8. Develop a VI program to measure frequency and period of Repetitive Signal.
9. Develop a VI program to measure frequency and period of Filtering example.
10. Develop a VI program to generate various types of Continuous and Discrete Time Signals.

SOFTWARE USED: - LabVIEW 8.5

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

SEMESTER VI

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name :- Antenna And Wave Propagation

Course Code :- UEC-350

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr
3 1 0 3.5

UNIT-I

RADIATION OF ELECTROMAGNETIC WAVES: Retarded potentials, Radiation from a small current element, fields of a short Dipole, Power radiated by a current element, Radiation from a half wave dipole and quarter wave monopole.

ANTENNA PARAMETERS: Antenna patterns, Isotropic Radiators, Radiation pattern, Gain, Directivity, Antenna Efficiency, Aperture, Reciprocity Theorem, Radiation resistance, Beam width.

UNIT-II

ANTENNA ARRAYS; Arrays of two point sources, Broadside array, End fire array, Collinear arrays, Parasitic arrays, Multiplication of pattern, Linear array with 'n' point sources, Binomial arrays, Antenna gain, Antenna aperture and its relation to gain, antenna terminal impedance, antenna temperature and signal to noise ratio.

UNIT-III

SPECIAL PURPOSE ANTENNAS: Reflector type antennas, Lens antenna, V and rhombic antennas, traveling wave antennas, Yagi antenna, Slotted and horn antennas, Basic idea of wide band antennas.

ANTENNA MEASUREMENTS: Measurement of field strength, antenna impedance, radiation pattern, radiation resistance, gain, directivity and effective length.

UNIT-IV

Plane earth reflection, space wave and surface wave, The surface wave, Elevated Dipole antennas above a plane earth, wave tilt of the surface wave, spherical earth propagation, Troposphere wave.

IONOSPHERIC PROPAGATION: Reflection and Refraction of waves by the ionosphere, Regular and Irregular variation, Attenuation factor, Effect of earth's magnetic field, wave propagation in ionosphere.

Text Books:

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

1. Antenna & Wave Propagation: K.D.Prasad, Satya Prakashan.

Reference Books:

1. Antennas: J.D.Kraus, McGraw Hill
2. Electromagnetic waves & radiating systems: F.C.Jordan & D.C.Balmann, P.H.I.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name :- Digital Signal Processing

Course Code :- UEC-351

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr
3 1 2 4.5

Unit–I
Classification of signals, singularity functions, classification of system, manipulation of Discrete time signals: Signal analysis, signal characteristics, typical discrete time signals, operation on signals, properties of linear time-invariant digital systems, sampling of analog signals and sampling rate conversion. Z-transform; Properties of Z-transform. Inverse Z-transform – analysis of discrete time systems, convolution.

Unit – II
System function, difference equation, IIR filter design: Analog filter approximation, Butter worth, Chebyshev and Elliptic filters, Bilinear transformations, Impulse invariance technique, Digital frequency band transformations. FIR filter design: Window technique, Equiripple approximation technique, Frequency sampling technique.

Unit – III
Discrete Fourier Transform (DFT) and Inverse Discrete time Fourier Transform: properties of DFT (circular convolution). Fast Fourier Transform (FFT): Decimation-in-time (DIT) algorithm-decimation-in-frequency algorithm-FFT, Radix-2 DIT and DIF implementation.

Unit – IV
Applications of DSP in Voice, RADAR and Image Processing. *TMS320CXX* SERIES PROCESSORS: Architecture, Memory, Interrupts, Addressing modes, Assembly language programming.

Text Books:

1. Digital Signal Processing: David.K.Defatta, Joseph G, Lucas & William S.Hodgkiss John Wiley & sons.
2. Digital Signal Processing: Sanjit K and Mitra, Tata McGraw Hill.
3. Digital Signal Processing- Principles, Algorithms & Applications: John G. Proakis Dimitris Manolakis, Pearson Education.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Reference Books:

1. Digital Signal Processing: A.V.Oppenheim & R.W.Schaffer, Prentice Hall.
2. Digital Signal Processing: Farooq Hussain, Prentice Hall.
3. Digital Signal Processing: Salivahanan,, Tata McGraw Hill.
4. Digital Signal Processing: J.S. Chitode & Vallavaraj & Gnanapriya, Technical Publication Pune.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Digital Signal Processing Lab

Course Code:- UEC-351

Evaluation Components for Practical Courses (Students are required to perform atleast 8 practicals mandatorily from thr given list of practicals)	
Lab Performance	10
Lab file work	10
Viva – Voce	10
Total	**30**

LIST OF EXPERIMENTS:

1. To represent basic signals (Unit step, unit impulse, ramp, exponential, sine and cosine).
2. To develop program for discrete convolution.
3. To develop program for discrete correlation.
4. To understand stability test.
5. To understand sampling theorem.
6. To develop program for computing Discrete Fourier Transform (DFT).
7. To design digital IIR filters (low-pass, high pass, band-pass, band-stop).
8. To design FIR filter using windows technique.
9. To design a program to compare direct realization values of IIR digital filter.
10. To develop a program for computing parallel realization values of IIR digital filter.
11. To develop a program for computing cascade realization values of IIR digital filter.
12. To develop a program for computing inverse Z-transform of a rational transfer- function.
13. System Design based on TMS320CXX.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name :- Mobile And Satellite Communication

Course Code :- UEC-352

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr
3 1 0 3.5

UNIT -I

Evolution of cellular Telephone, Fundamental Concepts of Cellular Telephone, Frequency Reuse, Interference, segmentation & Dualization, Cellular System Topology, Roaming & Handoffs, Cellular Telephone network Components, Cellular Cell processing.

UNIT -II

Different generations (1G to 4G) of Cellular Networks, AMPS, GSM, UMTS, GPRS, EDGE, Personal Comm. Systems, digital Cellular telephone, CDMA Cellular Radio network, Globle Systems for Mobile communication.

UNIT -III

Principle of Satellite Comm., Kepler's law, Geosynchronous Satellite, Antenna look angles, Satellite classifications spacing and Frequency allocation, Satellite antenna Radiation patterns, Footprints, Satellite link models, Parameter & Equations.

UNIT -IV

FDM/FM Satellite Systems, Multiple accessing – FDMA, TDMA, CDMA, Channel Capacity Special purpose Comm. Satellites, INTELSAT, VSAT (data broad – band Satellite), MSAT. LEOs (lower Earth Orbit Satellite), Defence Satellites.

Text Books

1. Advanced Electronic Communications Systems:Wayne Tomasi, Pearson Edu.

Reference Books:

1 Electronic Communications:Dennis Roddy & John Coolen, PHI.
2. Wireless communication:T. S. Rappaport, PHI.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Microwave Engineering

Course Code: - UEC-353

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr
3 1 2 4.5

Unit-I

INTRODUCTION TO MICROWAVES AND WAVEGUIDES: Microwave Region and Band Designations, Advantages of Microwaves, Applications of Microwaves. Introduction to waveguides, comparison of waveguides with 2-wire Transmission lines, Types of Waveguides, propagation in TE and TM mode, Rectangular wave guide, TEM mode in rectangular wave guide, Introduction to circular wave guide.

Unit-II

MICROWAVE COMPONENTS: Microwave Junctions: S-parameters, Microwave T-Junctions: H-plane, E-plane, E-H plane(Hybrid or magic) T-junctions, Applications of Magic T, Rat Race Junction, Directional couplers, Types of directional couplers, Waveguide joints, Bends, Corners, Transitions and Twists, Waveguide Irises, Posts and Tuning Screws, Waveguide Terminations, Attenuators, Cavity resonators, mixers and detectors, matched load, Phase Shifter, Ferrite devices: Isolators, Circulators, Gyrators. Microwave Filters: YIG Filter resonators.

Unit-III

MICROWAVE TUBES: High Frequency Limitations of conventional tubes, construction, operation and properties of Klystron amplifier, reflex Klystron, magnetron, Traveling wave tube(TWT), cross-field amplifier, backward wave oscillator.

MICROWAVE SOLID STATE DEVICES: Varactor and step recovery diodes, Microwave Transistors, Parametric amplifiers, Tunnel diodes, Gunn effect and diodes, MASER, LASER, IMPATT, TRAPATT, PIN diode, Schottky barrier and Backward diodes, Read diode,Microwave Antennas, Types of Microwave Antennas.

Unit-IV

MICROWAVE MEASUREMENTS: Microwave Bench-General Measurement Set-up, Power measurement using Calorimeter and Bolometers, Measurements of SWR, frequency and wave length, Impedance measurement, Measurement of Noise factor, Microwave bridges.

PROPAGATION OF MICROWAVE: Space wave propagation Effect of curvature of Ideal Earth, Various other considerations.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Text Books:

1. Microwave devices and Radar Engg.: M.Kulkarni, Umesh.

Reference Books:

1. Microwave Engineering: Concepts & Fundamentals, Shahid Ahmed Khan,Taylor & Francis.
2. Microwave devices and circuits: Samuel Liao, PHI

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Microwave Engineering Lab

Course Code: - UEC-353

Evaluation Components for Practical Courses (Students are required to perform atleast 8 practicals mandatorily from the given list of practicals)	
Lab Performance	10
Lab file work	10
Viva – Voce	10
Total	**30**

LIST OF EXPERIMENTS:

1. Study of wave-guide components.
2. To study the characteristics of reflex Klystron Tube and to determine its Electronic Tuning Range.
3. To determine the frequency and wavelength in a rectangular waveguide working on TE_{10} mode.
4. To determine the standing wave ratio and reflection coefficient by standing wave and Double Minimum Methods.
5. To study the function of multihole directional coupler(MHD coupler) by measuring the coupling factor, insertion loss and directivity of the coupler.
6. To study the Power Division in a Magic Tee.
7. To determine insertion loss and Isolation of Isolator and Circulator.
8. To measure insertion loss, Attenuation of Fixed and Variable Attenuators.
9. To measure the Phase Shift of a Phase shifter.
10. To study the V-I characteristics of GUNN diode.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Computer Networks & Data Communication

Course Code: - UEC-354

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr
3 1 2 4.5

UNIT – I

INTRODUCTION: Uses of computer Networks LAN, MAN, WAN, Wireless Networks, Networks software; Protocol hierarchies, design issues of layers, interfaces and services. The OSI reference model, the TCP/IP reference model

THE PHYSICAL LAYER: Fourier analysis, maximum data rate of a channel, transmission media, wireless transmission, ATM ; Virtual circuits versus circuits switching.

UNIT – II

DATA LINK LAYER: Data link layer design issues; services provided to network layers, framing, error control, flow control, error detection and correction.

ELEMENTARY DATA LINK PROTOCOL; an unrestricted simplex protocol. A simplex stop and wait protocol, simplex protocol for noisy channel, sliding window protocol; a one bit sliding window protocol, a protocol using go back-N, a protocol using selective repeat , data link protocols; HLDC- high level data link control.

THE MEDIUM ACCESS SUB LAYER

Channel allocation problem; static and dynamic channel allocation in LAN's and MAN's multiple access protocols- ALOHA carrier Multiple access protocol, wireless LAN protocol collision free protocols, limited contention protocols, IEEE standards 802.3 and Ethernet, high speed LANs.

UNIT – III

NETWORK LAYER: design issues, routing algorithms: Optimality principle , Shortest Path routing, distance vector routing, link state routing, hierarchical routing, routing in Adhoc networks, congestion control algorithm: Principles, prevention policies, congestion control in virtual circuit and datagram subnets, load shielding, jitter control, leaky bucket algorithm, token bucket algorithm, Internetworking**.**

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

UNIT – IV

TRANSPORT LAYER: Transport services, elements of transport protocols, simple transport protocol, overview of application layer (TCP, UDP).

SESSION LAYER: Purpose of Session Layer, Session Administration, Dialog control methods

PRESENTATION LAYER: Purpose of Presentation Layer

APPLICATION LAYER: Domain Name Server, Remote Logging (Telnet), Simple Mail Transfer Protocol, File Transfer Protocol, World Wide Web, Hyper Text Transfer Protocol.

Text Books:

1. Computer Networks-(3rd edition): Tannenbaum, PHI.

Reference Books:

1. Data & Computer Communication: Black,: PHI.
2. Data Communication and Networking: FORAUZAN, TMH

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Computer Networks & Data Communication Lab

Course Code: - UEC-354

Evaluation Components for Practical Courses (Students are required to perform atleast 8 practicals mandatorily from the given list of practicals)	
Lab Performance	10
Lab file work	10
Viva – Voce	10
Total	**30**

LIST OF EXPERIMENTS:

1) To study different types of transmission media.

2) To make inter-connections in cables for data communication in LAN.

3) PC to PC Communication: Parallel Communication using 8 bit parallel cable, Serial communication using RS 232C.

4) To study basic computer networks lab equipments- HUB/Switch, Router, Bridge, NIC.

5) To study & evaluate different computer network topologies i.e. Bus, Star, Mesh, Tree, Ring.

6) To install LAN using STAR topology.

7) To install LAN using Bus topology.

8) To configure a HUB/Switch.

9) To configure the modem of a computer.

10) Study of IP addressing & subnet masking.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name :- Embedded System Design

Course Code: - UEC-355

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr
3 1 2 4.5

UNIT – I
Introduction to Embedded system, Types of embedded system, Different types of Microcontrollers: Embedded Microcontroller, External memory Microcontroller. Processor architecture: Harvard and Princeton or Von Neumann architecture, CISC and RISC, Microcontroller memory types

UNIT – II
The 8051 Architecture: Introduction, 8051 Microcontroller Hardware, Input /Output Ports and Circuits, External Memory, Counter and Timers, Serial data Input/Output, Interrupts

UNIT – III
Basic Assembly Language Programming Concepts: The Assembly Language Programming Process, Programming Tools and Techniques, Programming the 8051. Data Transfer and Logical Instructions, Arithmetic Operations, Decimal Arithmetic. Jump and Call Instructions, Further Details on Interrupts.

UNIT – IV
Applications of 8051 : Interfacing with Keyboards, Displays, D/A and A/D Conversions, Multiple Interrupts, Serial Data Communication, 7segment, stepper motor.
PIC Microcontroller: Overview of PIC microcontroller – Instruction set – Timer compare and capture mode – watch dog Timer - Synchronous Serial Port – Serial Peripheral Interface – I2C Bus operation.

Text Books:

1. The 8051 Microcontroller and Embedded systems using assembly and C: Muhammad AliMazidi,& JaniceGillispie & Mazidi,Rolin D. McKinlay, Pearson Education
2. The 8051 Microcontroller: Kenneth J.Ayala, Thomson.

Reference Books:

1. An Embedded Software Primer:David E. Simon, Pearson Education.
2. Embedded Systems: Raj Kamal, TMH
3. Embedding system building blocks: Labr osse, CMP publishers.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Embedded System Design Lab

Course Code: - UEC-355

Evaluation Components for Practical Courses (Students are required to perform atleast 8 practicals mandatorily from the given list of practicals)	
Lab Performance	10
Lab file work	10
Viva – Voce	10
Total	**30**

LIST OF EXPERIMENTS:

1. Write a program to toggle P1.2 and P1.5 continuously without disturbing the rest of the bits.
2. Write a program to monitor bit P1.3.When it is high, send 55H to P2.
3. Write a program to get status of P1.3 and put it on P1.4.
4. Write a program to copy FFH in to RAM locations 50H to 6FH.
5. Write a code to PUSH R0, R1, and R3 of bank0 on to stack and POP them back in to R5, R6, and R7 of bank 3.
6. Write a program to copy 10 bytes of data starting at ROM address 400H to RAM locations starting at 30H.
7. Write a program to create square wave of 50% duty cycle on P1.5 bit. Used Timer0 to generate time delay.
8. Assume clock pulses are fed into pin T1,Write a program for counter 1 in mod 2 to count the pulses and display the state of the TL1 count on P2.
9. Write a program to send the message “BADDI UNIVERSITY” to serial port.
10. Write a program to display message on LCD.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

SEMESTER VII

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Radar and Navigation

Course Code :- UEC-400

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr
3 1 0 3.5

UNIT – I
Basic RADAR system, Frequencies and Powers used in Radar, Radar equation, prediction of range, detection of signals in Noise, receiver noise and S/N ratio, integration of radar pulses, prf (pulse repetition frequency) and range ambiguity, Antenna parameters, system losses.

UNIT – II
Doppler effect, Moving Target Indicator RADAR, Continuous Wave Doppler RADAR, FM-CW RADAR, Pulsed Doppler RADAR, RADAR beacons, Tracking RADAR -Monopulse Tracking, Conical scan and frequency lobing, clutters, applications of radar, delay lines.

UNIT – III
RADAR Transmitters: brief idea of Radar RF sources, transmitter noise and spectrum. Radar Receivers: Noise Figure, Superhetrodyne Receiver, Mixer, Dynamic Range, Oscillator, Amplifiers, detector, Duplexer, Radar Displays, Radar Antennas.

UNIT – IV
Introduction to navigation, Four methods of Navigation, VHF Phase comparison Direction Finder, Radio Ranges; LF/MF four course radio ranges, VOR, Instrument Landing System, Ground Controlled Approach-Surveillance RADAR and Precision approach RADAR, Synthetic aperture Radar.

Text Books:

1. Elements of Electronic Navigation: N.S. Nagaraja, TMH.

Reference Books:

1. Introduction to Radar systems-2nd Edition: Skolnik, TMH
2. Principles of Communication Systems: George F Kennedy, TMH

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Digital System Design

Course Code: - UEC-401

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr
3 1 0 3.5

UNIT- I
INTRODUCTION
Introduction to Computer aided design tools for digital systems. Hardware description languages; introduction to VHDL, data objects, classes and data types, Operators, Overloading, Logical operators. Types of delays Entity and Architecture declaration. Introduction to behavioral, data flow and structural models.

UNIT- II
VHDL STATEMENTS: Assignment statements, sequential statements and process, conditional statements, case statement Array and loops, resolution functions, Packages and Libraries, concurrent statements.
Subprograms: Application of Functions and Procedures, Structural Modeling, component declaration, structural layout and generics.

UNIT- III
COMBINATIONAL CIRCUIT DESIGN: VHDL Models and Simulation of combinational circuits such as Multiplexers, Demultiplexers, encoders, decoders, code converters, comparators, implementation of Boolean functions etc.
SEQUENTIAL CIRCUITS DESIGN: VHDL Models and Simulation of Sequential circuits. Shift Registers, Counters etc.

UNIT- IV
DESIGN OF MICROCOMPUTER: Basic components of a computer, specifications, architecture of a simple microcomputer system, implementation of ALU, RAM, Control Unit using VHDL.
DESIGN WITH CPLDs AND FPGAs: Programmable logic devices: ROM, PLAs, PALs, GAL, PEEL, CPLDs and FPGA. Design implementation using CPLDs and FPGAs.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Text Books:

1. VHDL Language Reference Manual- (1993): IEEE Standard
2. Digital Design and Modeling with VHDL and Synthesis: KC Chang, IEEE Computer Society Press.

Reference Books:

1. A VHDL Primer: Bhasker, Prentice Hall 1995
2. Digital System Design using VHDL: Charles.H.Roth, PWS (1998)

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name :- Digital System Design Lab

Course Code :- UEC-401

Evaluation Components for Practical Courses (Students are required to perform atleast 8 practicals mandatorily from the given list of practicals)	
Lab Performance	10
Lab file work	10
Viva – Voce	10
Total	**30**

LIST OF EXPERIMENTS:

1. Design all gates using VHDL.
2. Write VHDL programs for the following circuits, check the waveforms and the hardware generated
   (a) Half adder.
   (b) Full adder.
3. Write VHDL programs for the following circuits, check the waveforms and the hardware generated
   (a) Multiplexer.
   (b) Demultiplexer.
4. Write VHDL programs for the following circuits, check the waveforms and the hardware generated
   (a) Decoder.
   (b) Encoder.
5. Write a VHDL programs for a comparator and check the waveforms and the hardware generated
6. Write a VHDL programs for a flip-flop and check the waveforms and the hardware generated.
7. Write a VHDL programs for a counter and check the waveforms and the hardware generated.
8. Write a VHDL programs for a code converter and check the waveforms and the hardware generated.
9. Write a VHDL programs for a following circuits and check the waveforms and the hardware generated.
   (a) Register
   (b) Shift register
10. Implement any three (given above) on FPGA/CPLD kit.

Software Used: - XILINX ISE 8.1i

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name :- Optical Fiber System & Networks
Course Code :- UEC-402

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr
3 1 2 4.5

UNIT I
Need for Fiber Optic Communications System, Role of Fiber Optic communication technology, Basic Block Diagram, Advantages & Disadvantages of Optical Fiber Communication, structure of optical wave guide, light propagation in optical fiber using ray theory, Electromagnetic Mode Theory, Step Index Fiber, Graded Index Fiber, Attenuation- Bending Loses, Scattering, Absorption, Dispersion – Intermodal, Chromatic, limitations & remedies.

UNIT II
Light sources & Transmitters – Light Emitting Diodes, Hetero junction & DH structure, laser diodes, Principle of action, characteristics, efficiency, Block Diagram and typical circuits of Transmitter.

UNIT III
Receivers, Photodiodes -Working, Power relationship,PIN photodiodes, Avalanche photodiode, Block Diagram & typical circuits of receiver.

UNIT IV
Fiber Cable Connecterization– Splicing, Connectors, components of Fiber Optic Networks, Transceivers, Semiconductor, optical amplifiers - Principle of operation, Gain, Bandwidth, Cross talk, Noise, Applications, Advantages& Disadvantages.
Erbium Doped Fiber Amplifiers (EDFAs) - Operation, gain, noise, Components of EDFA module. Introduction to SONET/SDH; SONET/SDH Networks; formats and interface, WDM networks and components

Text Books:

2. Fiber Optic Comm. Systems: D.K.Mynbaev, Pearson Edu.

Reference Books:

1. Optical Fiber Comm.: John M.Senior, PHI Publications
2. Optical Fiber Comm.: G.Keiser, TMH

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Optical Fiber System Lab

Course Code :- UEC-402

Evaluation Components for Practical Courses (Students are required to perform atleast 8 practicals mandatorily from the given list of practicals)	
Lab Performance	10
Lab file work	10
Viva – Voce	10
Total	**30**

LIST OF EXPERIMENTS:

1. To study Fiber Optic Transmitters
2. To study Fiber Optic Detectors.
3. Transmitting a signal through Simplex Fiber Optic Link.
4. Transmitting a signal through Duplex Fiber Optic Link
5. Study of Digital Transceiver
6. To draw the characteristics of a Fiber Optic LED
7. To calculate losses in Optical Fiber transmission.
8. Determination of numerical aperture of optical fibers
9. Transmission of an audio signal through an optical fiber
10. Fiber optics hybrid modules for analogue transmission models Tx & Rx

Software used: SciTech PC to PC Communication Software

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

SEMESTER VIII

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name :- Digital Image Processing

Course Code :- UEC-451

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr
3 1 0 3.5

Unit-I
Introduction to Image Processing Historical background, visual perception, image formation, Elements of Storage, sampling & Quantization, Relationships between pixels-neighbors of pixel, connectivity labeling of connected components, Relations, equivalence and Transitive closure, Distance measures, Arithmetic/ Logic operation, Imaging Geometry Basic and perspective transformation stereo imaging, application of image Processing.

Unit-II
Image Enhancement Spatial and frequency domain methods point processing, intensity transformation, Histogram processing image substation and Averaging spatial filtering, LP, HP and homo-morphic felling, generation of spatial marks, Color image processing.

Unit-III
Image Compression Redundancy models, error free compression, Lossy compression, Image compression standards.

Unit-IV
Image Segmentation Detection of Discontinuity, Edge detection, Boundary detection, Thresholding, Regional oriented segmentation, use of motion in segmentation.

Text Books:

1 Digital Image Processing - Rafael C Gonzalez and Richard E. Woods, Pearson Education Society.

Reference Books:

1. Digital Image Processing - by Keenneth R Castleman, Pearson Education Society.
2. A. K. Jain, ―Fundamental of Digital Image Processing, PHI.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name :- Biomedical Electronics

Course Code :- UEC-452

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr
3 1 0 3.5

UNIT-I

BIOELECTRIC SIGNALS: - Origin of Biomedical signals. Sources of origin of various biomedical signals.

PHYSIOLOGICAL TRANSDUCERS: - Pressure and temperature Transducers, Photoelectric Transducers Optical fiber sensors, Pulse sensors, Respiration Sensors, Smart Sensors.

PATIENT SAFETY: - Electric shock Hazards, Leakage currents, Safety Codes for Electro medical equipment.

UNIT -II

RECORDING SYSTEM:- Basic recording system, sources of noise in low level recording circuits, pre amplifiers, drivers, various types of recorders-Inkjet, Potentiometer, UV, thermal array, electrostatic, light gate array.

BIOMEDICAL RECORD:- Electrocardiograph, phonocardiograph, Electroencephalograph, Electromyograph, Vectorcardiograph,

UNIT-III

MEDICAL DISPLAY SYSTEM: - Oscilloscopes, cardio scope, multichannel Display, Non-fade display system.

IMAGING SYSTEMS: Introduction to Basic Principle & Block Diagram of X-ray Machine, Computer Tomography and Nuclear Magnetic Resonance (NMR) Tomography, Ultrasonic Imaging Systems, Ultrasound, Fetal Monitoring System.

UNIT -IV

CARDIAC PACEMAKERS: -External Pacemaker, implantable & Programmable pacemakers, power sources for implantable pacemakers, Leads and electrodes.

CARDIAC DEFIBRILLATOR: DC Defibrillators, Implantable defibrillators.

BIOMEDICAL TELEMETRY: Wireless telemetry system, Single Channel telemetry, multichannel wireless telemetry, **Telemedicine.**

PATIENT MONITORING SYSTEM:-Cardiac Monitor, Patient monitoring systems, Central monitors, Measurement of Heart rate, Measurement of Pulse rate

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Text Books:

1. Hand Book of Biomedical instrumentation: R.S. Khandpur, TMH.

Reference Books:

1. Biomedical Electronics: Cromwell, PHI
2. Biomedical Instruments Theory and design: Walter Welko Witiz, Academic Press

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

DEPARTMENTAL ELECTIVES

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Neural Networks and Fuzzy Logic

Course Code :- UEC-452

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

LT P Cr
3 1 0 3.5

UNIT – I

Introduction to Neural Networks: Introduction, Humans and Computers, Organization of the Brain, Biological Neuron, Biological and Artificial Neuron Models, Characteristics of ANN, McCulloch-Pitts Model, Historical Developments, Applications of ANN.

UNIT – II

Learning Approach Supervised Learning: Single-layer Networks: Linear Separability, handling linearly non-separable sets. Training algorithm. Multi-layer network: Architecture, Back Propagation Algorithm (BPA) – Various parameters and their selection, feed -forward Network, Radial- Basis Function (RBF) network & its learning strategies.

Unsupervised Learning: Winner-takes Networks, Hamming Networks. Adaptive Resonance Theory, Kohonen's Self-organizing maps.

UNIT – III

Introduction to Fuzzy Sets: Introduction to classical sets - properties, Operations and relations; Fuzzy sets, Membership, Uncertainty, Operations, properties, fuzzy relations, cardinalities, membership functions.

Fuzzy Logic System Components: Fuzzification, Membership value assignment, development of rule base and decision making system, Defuzzification to crisp sets, Defuzzification methods.

UNIT – IV

Applications: Neural network applications: Process identification, control, fault diagnosis.
Fuzzy logic applications: Fuzzy logic control and Fuzzy classification.

Text Books:

1. "Neural Networks, Fuzzy logic, Genetic algorithms: Synthesis and Applications: S.Rajasekharan and G. A. Vijayalakshmi pai, PHI Publication, 2004.
2. "Introduction to Artificial Neural Systems': Jacek M. Zurada, Jaico Publishing home, 2002.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Reference Books:

1. Neural Networks:James A Freeman and Davis Skapura, Pearson Education, 2002.
2. Fuzzy Logic With Engineering Applications:Timothy J. Ross, McGraw-Hill Inc. 1997
3. Fuzzy Logic: Intelligence, Control and Information: John Yen and Reza Langari, Pearson Education, 2004.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name :- Television Engineering

Course Code: - UEC-453

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P
Cr
3 1 0 3.5

UNIT I
PRINCIPLES OF TV:
Picture elements, Theory of line, frame and field frequencies Blanking, Synchronization, interfacing, resolution, vertical resolution, horizontal resolution and video bandwidth, Use of AM in video and FM in audio, Block Diagram of TV Transmitter and Receiver, Construction of composite video signal.

UNIT II
TELEVISION CAMERAS AND PICTURE TUBES:
Spectrum of light and eye response, Image orthicon, plumbicon, vidicon (Principles of operation, Construction and working),TV picture tube details, Modulation system used for sound and picture, VSB working, TV transmitter.

UNIT III
TV RECEIVER:
Block Diagram of TV Receiver, Tuner Circuits, Choice of IF amplifier, A.M. & F.M. detectors, Receiver sweep circuits, Video Frequency amplifier, synch. Pulse representation, deflection circuits.

UNIT IV
COLOUR TV:
Hue, Saturation and luminance, Luminance and colour signal generation, Types of colour picture tubes (Basic principles and construction), colour subcarrier and colour triangle, NTPC, PAL, SECAM systems, Colour TV transmission & reception, Block Diagram of digital TV with merits.

REFERENCE BOOKS:

1. Monochrome & Colour TV: R.R Gulati: New Age Pub.
2. Basic Television: G.M Grob : McGraw Hills
3. T.V. Engg : Dhake : Tata McGraw Hills

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Nanotechnology

Course Code: - UEC-454

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr
3 1 0 3.5

UNIT – I

Introduction:

Introduction to Nano scale systems, Length energy and time scales, Top down approach to Nano lithography, Spatial resolution of optical, deep ultraviolet, X-ray, electron beam and ion beam lithography, Single electron transistors, coulomb blockade effects in ultra-small metallic tunnel junctions.

UNIT – II

Quantum Mechanics:

Quantum confinement of electrons in semiconductor Nano structures, Two dimensional confinement (Quantum wells), Band gap engineering, Epitaxy, Landaeur – Buttiker formalism for conduction in confined geometries, One dimensional confinement, Quantum point contacts, quantum dots and Bottom up approach, Introduction to quantum methods for information processing.

UNIT – III

Molecular Techniques:

Molecular Electronics, Chemical self assembly, carbon nano tubes, Self assembled mono layers, Electromechanical techniques, Applications in biological and chemical detection, Atomic scale charcterization techniques, scanning tunneling microscopy, atomic force microscopy.

REFERENCE BOOKS:

1. Beenaker and Van Houten "Quantum Transport in Semiconductor Nanostructures in Solid state Physics" Ehernreich and Turnbell, Academic press, 1991

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Artificial Intelligence

Course Code :- UEC-455

Assessment and Evaluation Components	
Quizzes /Assignments/ Presentation/Class Test/ Open Book Test/ Case Study	25
Mid Term Tests (MTE)	20
Attendance Marks	05
End Term Examination	50
Total	**100**

L T P Cr
3 1 0 0

UNIT – I

Introduction to AI:

Problems, Techniques and programming Languages. Introduction to LISP : List manipulations, functions, predicates, and conditionals , input , output and logical variables, iteration and recursion. Lists and arrays. Introduction to PROLOG. Problems, Problems Spaces & Search: Defining a problem as a space, search, production systems, problem characteristics, production system characteristics, issues in the design of search programs.

UNIT – II

Heuristic Search Techniques:

Generate – and – test, Hill Climbing, best – first search (A*), Problem Reduction (AO*), constraint satisfaction, Means End Analysis.

Knowledge Representation Issues: Representations and Mappings, approaches to knowledge representations, issues of knowledge representations, the frame problem

UNIT – III

USING PREDICATE LOGIC: Representing simple facts in logic representing instance & its relationships, computable functions and predicates, resolution natural deduction.

REPRENTING KNOWLEDGE USING RULES: Procedural vs. declarative knowledge, logic programming, forward and backward searching, matching, control knowledge,

UNIT – IV

GAME PLAYING AND SEARCH: Introduction Min-Max Algorithm, alpha-beta cut off. Examples of games.

EXPERT SYSTEM: Component of an expert system, categories of an Expert System, stages in development of Expert System, Expert System Development Tools. Expert System Architecture, Frames.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

TEXT BOOKS:

1. Introduction to artificial intelligence & expert system, patterson, d.w.: prentice hall of india, new delhi.

REFERENCE BOOKS:

1. Artificial Intelligence, Rich, e & knight, k: Tata Mcgraw Hill pub co, New Delhi
2. Principles of artificial intelligence nilson, n.j.: narosa pub, house
3 Artificial intelligence, using c schmildt, h: Mcgraw hill

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

OPEN ELECTIVES

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name :- Software Project Management

Course Code :- UCS-480

L T P CR.
3 1 0 3.5

Prerequisites: Nil

Objective:

The intent of the course is to build upon understanding of software project management.. The course develops an insight towards the evolution of software economics and the various life cycle phases. The course deals with the project control and process instrumentation and the various case studies linked with it.

Course Description:

- **Module 1: Conventional Software Management**
  - The waterfall model
  - conventional software Management performance.
  - Evolution of Software Economics
  - Software Economics
  - pragmatic software cost estimation
  - Improving Software Economics
  - Reducing Software product size
    - improving software processes
    - improving team effectiveness
    - improving automation
    - Achieving required quality
    - Peerinspections
- **Module 2**: **The old way and the new**
  - The principles of conventional software Engineering
  - principles of modern software management
  - Transitioningtoaniterativeprocess
  - Life cycle phases
  - Engineering and production stages
  - inception
  - Elaboration
  - construction
  - transitionphases
  - Artifacts of the process
  - The artifact sets
    - Management artifacts
    - Engineering artifacts
    - programmatic artifacts
- **Module 3: Model based software architectures**
  - A Management perspective and technical perspective
  - Work Flows of the process
    - Software process workflows

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

- Iteration workflows

- Checkpoints of the process
- Major mile stones
- Minor Milestones
- Periodic status assessments
- Iterative Process Planning
  - Work breakdown structures
  - planning guidelines
  - cost and schedule estimating
  - Iteration planning process
  - Pragmatic planning
- Project Organizations and Responsibilities
- Line-of-Business Organizations
- Project Organizations
- evolution of Organizations
- Process Automation
- Automation Building blocks
- The Project Environment

- **Module 4: Project Control and Process instrumentation**
  - The seven core Metrics
  - Management indicators
  - quality indicators
  - life cycle expectations
  - pragmatic Software Metrics
  - Metrics automation.
  - Tailoring the Process
  - Process discriminants
  - Future Software Project Management
  - Modern Project Profiles
  - Next generation Software economics
  - modern process transitions
  - Case Study
  - The command Center Processing and Display system- Replacement (CCPDS-R)

Learning Outcomes:

- Better understanding of the life cycle phases.
- Acquiring knowledge for process automation
- Preparedness for skills used in iterative process planning.

Assessment Model:

- Best 4 of 6 quizzes BASED ON assignments- 25%
- ATTENDANCE : 5%
- One best out of TWO Mid-Terms (100 Marks) – 20%
- End-Term (100 Marks) – 50%
- Total Assessment (Out of 100 Marks) – 100%

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Preferred Reading:

1. Course Notes by the Instructor
2. Walker Royce: Software Project Management
3. Bob Hughes and Mike Cotterell: Software Project Management
4. Joel Henry: Software Project ManagementPankaj Jalote: Software Project Management in practice.

References Notebook :-

Web Resources:

- http://en.wikipedia.org/wiki/Software_project_management
- https://www.comp.glam.ac.uk/staff/dwfarthi/projman.htm
- http://www.linkedin.com/skills/skill/Software_Project_Management

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name :- **Distributed operating system**

Course Code :- **UCS-481**

L	T	P	Cr
3	1	0	3.5

Prerequisites: knowledge of operating system, deadlocks, semaphores.

Objective:

- understanding basic distributed file systems.
- understanding the file system abstraction;
- understanding key aspects of distributed file systems;
- understanding the basics of NFS and AFS

Course Description:

Module 1: Distributed computing systems fundamentals

- Introduction to Distributed computing systems,
- Models, Popularity.
- Distributed Computing system.
- Design issues of Distributed operating system.
- Distributed computing environment

Module 2: Message Passing

- Features of a good Message Passing System.
- Issues in IPC by Message Passing Synchronization,
- Buffering, Multi datagram Messages,
- Encoding and Decoding Message data, Process Addressing,
- Failure Handling, Group Communication.
- RPC Model, Transparency of RPC,RPC messages,
- Marshaling Arguments and Results.
- Server Management, Parameter Passing semantics,
- Call semantics, Communication Protocols for RPCs,
- Client Server Building, Exception handling,
- Security ,RPC in Heterogeneous Environments, Lightweight RPC.

Module 3: Distributed Shared Memory:

- General architecture of DSM systems.
- Design and implementation Issues of DSM,
- Granularity, Structure of Shared Memory Space. Consistency models,
- Replacement strategy, Thrashing.Synchronization:
- Clock Synchronization.
- Event Ordering, Mutual Exclusion, Deadlock, Election
- Algorithms.

Module 4: Resource Management

- Features of global scheduling algorithm.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

- Task assignment approach,
- Load-Balancing and Loadapproach.
- Process Management: Introduction, Process Migration,
- Threads. Distributed File Systems:
- Features of good DFS, File models, File Accessing models

Learning Outcomes:

Upon completion of the subject, students will be able to:

- Explain the objectives and functions of modern operating systems
- Describe how operating systems have evolved over time from primitive batch systems to sophisticated multi-user systems
- Analyze the tradeoffs inherent in operating system design
- Describe the functions of a contemporary operating system with respect to convenience, efficiency, and the ability to evolve

Assessment Model:

- Best four of six quizzes based on assignments- 25%
- One best out of TWO Mid-Terms (100 Marks) – 20%
- ATTENDANCE :5%
- End-Term (100 Marks) – 50%
- Total Assessment (Out of 100 Marks) – 100%

Preferred Reading:

1. Pradeep Sinha K., "Distributed Operating Systems concepts and design", PHI learning private limited.
2. Mukesh Singhal, Niranjan G Shivarathri, "Advanced Concepts in Operating systems", Tata McGraw Hill Ltd.
3. Coulouris.G, Dollimore J & Kindberg T, "Distributed Systems concepts and design", 4th edition, Pearson Education.
4. Tanenbaum A S, " Modern Operating System", PHI learning private limited, 3rd edition.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name :- **GRID COMPUTING**

Course Code :- **UCS-482**

L	T	P	Cr.
3	1	0	3.5

Prerequisites: Nil

Objective: Grid computing is the federation of computer resources from multiple administrative domains to reach a common goal. The grid can be thought of as a distributed system with non-interactive workloads that involve a large number of files. What distinguishes grid computing from conventional high performance computing systems such as cluster computing is that grids tend to be more loosely coupled, heterogeneous, and geographically dispersed.

Course Description:

- **Module 1 : Introduction**
  - Grid Computing
  - Benefits of Grid Computing
  - VirtualOrganizations
  - Grid Architecture and its relationship to other distributed technologies
  - Grid Application Areas,
    - OGSA
    - OGSI
    - Introduction to Semantic Grids.
  - Building Blocks for Grid Systems
    - XML
    - SOAP
    - UDDI
    - Service Oriented Architecture
    - Web Services
    - Web Services Architecture
    - WSRF
    - Relationship between Grid and Web Services
    - Grid and Web Services Invocation**.**

- **Module 2 : Data Management**
  - Overview of Data Management in GT4
  - Data Movement:
    - Grid FTP
    - RFT
    - Data Replication
    - RLS

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

- Higher level data services.

- Resource Management and Scheduling
- Resource Management Concepts
- Generalized Resource Management Framework
- Grid Resource Management Systems
- Scheduling in Grids
- QoS
- Introduction to GRAM

- **Module 3** :**Security**
  - Security Issues in Grids
  - Authentication Issues
  - Trust and Privacy related Issues
  - Authorization Issues
  - Grid Security Frameworks
  - Standards
  - Web Services Security Specifications.
  - Monitoring and Discovery Services:
    - Index Services
    - Resource Discovery
    - UDDI
    - Introduction to MDS in GT4

- **Module 4 : Grid Middleware and Programming Model**
  - Study of Globus Toolkit 4 Components
  - Programming Model
  - Singleton and Multiple Resources
  - Logging
  - Lifecycle Management
  - Notifications
  - Study of important distributed systems like Legion,
  - CRISI

Learning Outcomes:

- Better equipped with the understanding of Grid Architecture and its relationship to other Distributed technologies.
- Introduction to Grid Resource Management Systems.
- Acquiring know how of Security Issues in Grids and Grid Middleware and Programming Model.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Assessment Model:

- Best 4 of 6 quizzes based on assignments- 25%
- One best out of TWO Mid-Terms (100 Marks) – 20%
- Attendance :5%
- End-Term (100 Marks) – 50%
- Total Assessment (Out of 100 Marks) – 100%

Preferred Reading:

- Grid Computing, First Edition by Joshy Joseph, Craig Fellenstein , Pearson Education
- The Grid 2: Blueprint for a New Computing Infrastructure, Second Edition, by Ian Foster, Carl Kesselman , Morgan Kaufman
- Introduction to Grid Computing, First Edition by Bart Jacob, Michael Brown, Kentaro Fukul, Nihar Trivedi , IBM Red Books
- Grid Resource Management - State of the Art and Future Trends by Zarek Nabrzyski, Jennifer M. Schopf, Jan Weglarz , Kluwer Academic Publishers
- Grid Computing Security by Anirban Chakrabarti , Springer

Web Resources:

- en.wikipedia.org/wiki/Grid_computing
- www.gridcomputing.com/
- www.webopedia.com/grid_computing.html

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - **Software Reliability**

Course Code :- **UCS-483**

L	T	P	Cr
3	1	0	3.5

UNIT I

INTRODUCTION

Need and Concepts of Software Reliability, Failure and Faults– Prevention, Removal, Tolerance, Forecast, Dependability Concept– Failure Behavior, Characteristics, Maintenance Policy, Reliability and Availability Modeling, Reliability Evaluation

UNIT II

SOFTWARE RELIABILITY MODELS

Introduction (Historical Perspective and Implementation, classification, limitations and issues, Exponential Failure Models – Jelinski(moranda model, Poisson, Musa, Exponential models, Weibull Model, Musa(okumoto Model, Bayseian Model – Littlewood verral Model, Phase Based Model

UNIT III

PREDICTION ANALYSIS

Model Disagreement and Inaccuracy – Short & Long Term Prediction, Model Accuracy, Analyzing Predictive Accuracy – Outcomes, PLR, U & Y Plot, Errors and Inaccuracy, Recalibration –Detecting Bias, Techniques, Power of Recalibration, Limitations in Present Techniques, Improvements.

UNIT IV

THE OPERATIONAL PROFILE

Concepts and Development Procedures – Customer Type, User Type, System Mode, Functional and Operational Profile, Test Selection (Selecting Operations, Regression Test, Special Issues – Indirect Input Variables, Updating, Distributed system, CASE STUDY (Application of DEFINITY & FASTAR, Power Quality Resource System TESTING FOR RELIABILITY MEASUREMENT Software Testing – Types, White and Black Box, Operational Profiles – Difficulties, Estimating Reliability, Time/Structure based software reliability – Assumptions, Testing methods, Limits, Starvation , Coverage, Filtering, Microscopic Model of Software Risk.

REFERENCE BOOKS

1. Patric D. T.O connor, “Practical Reliability Engineering”, 4th Edition, John Wesley & sons, 2003.
2. John D. Musa, “Software Reliability Engineering”, Tata McGraw Hill, 1999.
3. Michael Lyu, “Handbook of Software Reliability Engineering”, IEEE Computer Society Press, ISBN: 0(07(039400(8, 1996)

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - **E-COMMERCE & ERP**

Course Code :- **UCS-484**

L	T	P	Cr
3	1	0	3.5

Prerequisites: NIL

Objective:

1. understand the basic concepts and technologies of ERP systems;
2. be familiar with the basic usage of ERP systems, such as SAP;
3. be able to analyze important issues in implementing an ERP system in a firm;
4. develop ability and confidence in exploiting benefits from ERP systems and/or other information technology for business

Course Description:

i) **Module 1: Introduction and Concepts:**

1. Networks and commercial transactions – Internet and other novelties;
2. networks and electronic transactions today, Model for commercial transactions;
3. Internet environment – internet advantage, worlds wide web and other internet sales venues
4. Online commerce solutions.

4. Security Technologies:

1. Insecurity Internet; A brief introduction to Cryptography;
2. Public key solution; Key distribution and certification;
3. Prominent cryptographic applications.

5. Electronic Payment Methods:

1. Updating traditional transactions; secure online transaction models;
2. Online commercial environments; digital currencies and payment systems;
3. Offline secure processing; private data networks.

6. Protocols for Public Transport of Private Information:

1. Security protocols; secure protocols; Secure hypertext transfer protocols;
2. Secure sockets layers; Integrating security protocols into the web;
3. Non technical provide.

ii) **Module 2 : Electronic Commerce Providers:**

1. On-line Commerce options: Company profiles.
2. **Electronic Payment Systems:** Digital payment systems;
3. First virtual internet payment system; cyber cash model.

7. On-line Commerce Environments:

1. Servers and commercial environments; Netscape product line;
2. Netscape commerce server; Microsoft internet explorer and servers; open market.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

8. Digital Currencies:

1. Optional process of Digicash, Ecash Trail; Using Ecash; Smart cards,
2. Electronic Data Interchange; Its basics;
3. EDI versus Internet and EDI over Internet.

9. Strategies, Techniques and Tools:

1. Internet Strategies: Internet Techniques,
2. Shopping techniques and online selling techniques;
3. Internet tools. Electronic Commerce Online Resources and Guide to
4. the CD-ROM.

iii) **Module 3: ERP** –

1. An Enterprise Perspective; Production Finance,
2. Personnel disciplines and their relationship, Transiting environment,
3. MIS Integration for disciplines, Case Study, Information / Workflow,
4. Network Structure, Client Server Integrator System, Virtual

Enterprise. ERP –

1. Resource Management Perspective; Functional and Process of Resource. Management,
2. Basic Modules of ERP System-HRD, Personnel Management,
3. Training and Development, Skill Inventory,
4. Material Planning and Control, Inventory, Forecasting, Manufacturing,
5. Production Planning, Production Scheduling,
6. Production Control, Sales and Distribution,
7. Finance, Resource Management in global scenario,
8. dynamic data management in complex global scenario.

iv) **Module 4: ERP – Information System Perspective:**

1. Evolution of Application Software Technology Management,
2. EDP, MIS, DBMS, DSS OLAP (Online Analysis and Processing),
3. TP, OAS, KBS, MRP, BPR, SCM, REP, CRM,
4. Information Communication Technology, E-Business, E-Commerce, EDI

10. ERP-Key Managerial Issues:

1. Concept Selling, IT Infrastructure, Implication,
2. ERP Systems on Business Organization, Critical success factors in ERP System,
3. ERP Culture Implementation Issues, Resistance to change,
4. Public Service and Organizations (PSO) Project,
5. ERP Selection issues, Return on Investment, Pre and Post Implementation Issues

Learning Outcomes:

1 To demonstrate a clear and relevant understanding of the definitions, importance, potential business values, and relevant technologies of ERP systems;

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

2 To demonstrate the ability in learning the applications of ERP and using the up-to-date ERP systems (such as SAP) for business.
3 To demonstrate a clear understanding of the life-cycle model of the process that a firm goes through with ERP system.

Assessment Model:

- Best 4 of 6 quizzes BASED ON assignments- 25%
- One best out of TWO Mid-Terms (100 Marks) – 20%
- ATTENDANCE: 5%
- End-Term (100 Marks) – 50%
- Total Assessment (Out of 100 Marks) – 100%

Preferred Reading:

1. Frontiers of Electronics Commerce by Ravi lalakota, Andrew Whinston
2. Enterprise Resource Planning – Concepts and practice by K. Garg and N.K. Venkita Krishna
3. The SAP/3 Handbook by John Antonio, Fernandz

Web Resources:

I. http://www.practicalecommerce.com/articles/3264-12-Sites-for-Ebook-Publishing
II. http://www.ebooksdownloadfree.com/eCommerce/Free-eCommerce-Books-CI49P0.html
III. http://blog.publishingtechnology.com/online/ebooks-ecommerce/

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - **DATA WAREHOUSING & DATA MINING**

Course Code :- **UCS-485**

L	**T**	**P**	**Cr**
3	1	0	3.5

Prerequisites: Nil

Objective:

The intent of the course is to build upon understanding of data ware housing and data mining. The course develops an insight towards the architecture and need of dataware housing. It gives the introduction to OLAP and its operations and the Various data mining tasks and the rules associated with data mining and its applications.

Course Description:

- Module 1: **Introduction to Data Warehousing**
  - Data Warehousing
    - Definition and characteristics
    - Need for data warehousing
    - DBMS vs. data warehouse
  - OLAP
    - Overall Architecture
  - Data Warehouse Database
  - Sourcing
  - Acquisition
  - Cleanup and Transformation Tools
  - Metadata Access Tools, Data Marts
  - **Introduction to Data Mining**
  - Data mining
    - Data mining functionalities
    - Kinds of patterns can be mined
    - Classification
    - Major issues
    - Functionalities
    - Classification data mining systems
  - Multidimensional data model
    - Data cubes
    - Schemas for multidimensional databases
  - OLAP operations
  - Metadata
- Module 2: **Data Pre-Processing**
  - Data cleaning
  - Data Integration and Transformation
  - Data Reduction, Discretization and concept hierarchy generation
  - Data mining primitives

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

- Data mining Task
- A data mining query language
- Architecture of Data mining systems
- Characterization and comparison

– **Concept Description**
– Data mining techniques
  - Concept description attribute oriented induction
  - Analytical characterization
  - Mining class comparisons
  - Mining descriptive statistical measures

- Module 3: **Association Rule Mining**
  – Mining single dimensional
  – Boolean association rules from transactional databases
  – Apriori algorithm, efficiency
  – Mining rules without candidate generation
    - Mining multilevel association rules from transaction databases mining multidimensional association rules from Relational databases and Data warehouses
    - From association mining to correlation analysis
    - Constraint based association mining
- Module 4: **Applications and Trends in Data Mining**
  – Data mining system products and Research prototypes
  – Additional themes on Data mining
  – Social Impacts of Data Mining
    - Trends in Data mining
    - Realization to data mining using SQL Server
  – Case studies in building
    - business environment
  – Application of data ware housing
  – Data mining in Government
  – National Data ware houses and case studies
  – Commercial Importance of DW
  – Applications of data mining
    - data mining in business process
    - embedded data mining

Learning Outcomes:

- Better understanding of dataware housing and data mining.
- Acquiring knowledge for rules associated with data mining.
- Preparedness for skills used in various methodologies and the case studies in building data mining.

Assessment Model:

- Best 4 of 6 quizzes BASED ON assignments- 25%
- One best out of TWO Mid-Terms (100 Marks) – 20%
- ATTENDANCE : 5%

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

- End-Term (100 Marks) – 50%
- Total Assessment (Out of 100 Marks) – 100%

Preferred Reading:

1. Course Notes by the Instructor
2. Jiawei Han & Micheline Kamber: Data Mining –Concepts & Techniques
3. Alex Berson : Data Warehousing, Data Mining and OLTP
4. Sam Anahory & Dennis Murray: Data Warehouseing in the Real World
5. Pieter Adrians, Dolf Zantinge: Data Mining

Web Resources:

http://en.wikipedia.org/wiki/Data_warehouse
http://books.google.co.in/books/about/Data_Warehousing
http://www.anderson.ucla.edu/faculty/jason.frand/teacher/technologies

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Advance Construction Techniques and Project Management

Course Code: - UCE-312

Prerequisites: Concrete Technology, Building Construction Technology

Objective: This course will help the student to have complete knowledge about the precast & prefabricated construction technology with emphases on the quality control especially on joints which are considered as the weakest section of any structure.

COURSE DESCRIPTION

- **UNIT - 1:** : Introduction
  - Materials - Modular co-ordination, standardization and tolerances-system for prefabrication.
  - Pre-cast concrete manufacturing techniques
  - Moulds –construction design, maintenance and repair
- **Unit 2:** Construction Techniques:
  - Pre-casting techniques - Planning, analysis and design considerations
  - Handling techniques-TransportationStorage and erection of structures.
- **UNIT 3:CPM**
  - Introduction
  - Network techniques, work break down
  - Classification of activities, rules for developing networks, network development-logic of network, allocation of time to various activities
  - Fulkerson's rule for numbering events, network analysis ,determination of project schedules, critical path, ladder construction, float in activities, shared float, updating
  - Resources allocation, sources smoothing and resources leveling.

PERT:

- Probability concept in network, optimistic time, pessimistic time, most likely time, lapsed time, deviation, variance, standard deviation, slack critical path, probability of achieving completion time, central limit theorem.

- **UNIT 4: Cost-Time Analysis:**
  - Cost versus time, direct cost, indirect cost, total project cost and optimum duration

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

- Contracting the network for cost optimization, steps in time cost optimization, illustrative examples.

Inspection & Quality Control:

- Introduction
- Principles of inspection
- Enforcement of specifications
- Stages in inspection
- Quality control and testing of structures
- Statistical analysis.

Learning Outcomes:

At the end of this course the student will be conversant with

- Properties and application of admixture
- Mix Design
- Properties of concrete
- Awareness of modern technology
- Knowledge of special type of concrete

Assessment Model:

(a) Average of best Four quizzes out of all Six quizzes(25 Marks) - 25%
(b) Average of Two Mid-Terms (50 Marks) - 20%
(c) Attendance (5 Marks) - 5%
(d) End-Term (100 Marks) - 50%
(e) Lab work – 30 Marks
(f) Total Assessment (Out of 130 Marks) – 100%

Preferred Reading:

(a) Krishnaraju, N., Advanced Concrete Technology, CBS Publishers, 1985

(b) Nevile, A.M., Concrete Technology, Prentice Hall, Newyork, 1985.

(c) Construction Planning &Management by P.S. Gehlot&B.M.Dhir

(d) PERT & CPM -Principles & Applications by L.S.Srinath

Web Resources:

- http://www.wickipedia.ac
- www.sciencedirect.com
- http://engineeringcivil.com

Course Name: - Advance Environmental Engineering

Course Code: - UCE-365

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

LT P Cr
3 1 0 3.5

Prerequisites: Concrete Technology, Building Construction Technology, DCS

Objective: This course will help the student to have complete knowledge about the precast & prefabricated construction technology with emphases on the quality control especially on joints which are considered as the weakest section of any structure

COURSE DESCRIPTION

UNIT - 1: ADVANCED WASTEWATER TREATMENT: Need for advanced wastewater treatment, process selection, granular- medium filtration, micro screening, control of nutrients, combined removal of nitrogen and phosphorus by biological methods, removal of toxic compounds and refractory organics, removal of dissolved inorganic substances, natural treatment systems- floating aquatic plant treatment systems.

UNIT - 2

AIR AND WATER QUALITY MONTORING: Design of air monitoring survey network, siting criteria, models for monitoring site selection, principles and techniques for ambient and stack sampling, acquisition and analysis of monitored data, BIS methods. Monitoring of water quality, planning sampling networks and schedules, sample collection and analysis, presentation and interpretation of results, methods and instruments for monitoring water pollutants, standards.

UNIT - 3

ENVIRONMENTAL MODELLING AND SIMULATION: Principles of modeling and simulation, classification, introduction to air quality models, air pollution meteorology, impact on local and global climate, atmospheric stability, Gaussian models and modifications. Introduction to river, estuaries and lake hydro dynamics, dissolved oxygen models, eutrophication and nutrient- phytoplankton models, toxic substance models, temperature models, models for management applications.

UNIT – 4:

RESOURCES AND ENERGY RECOVERY FROM SOLID WASTE: Processing techniques, material recovery systems, recovery of biological conversion products, recovery of thermal conversion products, recovery of energy from conversion products, materials and energy recovery systems.

Learning Outcomes:
At the end of this course the student will be conversant with

- The introduction of Waste Water and their treatment

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

- Advanced Treatments for Air and Water Pollution

Assessment Model:

(a) Average of best Four quizzes out of all Six quizzes(25 Marks) - 25%
(b) Average of Two Mid-Terms (50 Marks) - 20%
(c) Attendance (5 Marks) - 5%
(d) End-Term (100 Marks) - 50%
(e) Total Assessment (Out of 100 Marks) – 100%

Note Book:-

1. Waste water Engineering- treatment and Reuse (Fourth Edition) : Metcalf & Eddy Inc: Tata McGraw Hill
2. Air Monitoring Survey Design K.E. Noll & T.L. Miller : Ann Arbor Science
3. Air Pollution Control Engineering (Second Edition): N.D. Nevers: McGraw Hill

Web Resources:

4. http://www.wickipedia.ac
5. www.sciencedirect.com
6. http://engineeringcivil.com

Course Name: - Advance Concrete Technology

Course Code: - UCE-311

L T P Cr

3 1 0 3.5

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Prerequisites: Concrete Technology
Objective: The intent of this subject is to create understanding of different ingredients required for making concrete, properties of fresh and hardened concrete as well as mix design and testing of high strength concrete. It will also create awareness about the new technologies used for concreting operations.

COURSE DESCRIPTION

- **UNIT - 1:** : Introduction:
    - Structure of hydrated Cement
    - Special Cements
    - Chemical admixtures
    - Concept of Green Concrete using Mineral Admixtures
    - Corrosion protection
    - Fire resistance
    - Sulphate attack on concrete
    - Diffusion of chlorides in concrete
    - Evaluation of concrete strength
    - NDT Techniques
- **Unit 2:** Concrete mix design:
    - Principles of Concrete mix design
    - Methods of Concrete mix design
    - Design of high strength concrete and
    - High performance concrete
- **Unit 3:** Properties of concrete:
    - Rheological behavior of fresh Concrete
    - Properties of fresh concrete
    - Properties of hardened concrete
    - Strength
    - Elastic properties
    - Creep and Shrinkage
    - Variability of concrete strength
- **Unit 4:** Modern Trends in concrete:

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

- Modern trends in concrete manufacture
- Placement techniques

- Methods of transportation
- Placing of concrete
- Curing Techniques
- Extreme whether concreting
- Special concreting methods
- Vacuum dewatering of concrete
- Under water concreting

Special concrete:

- Guniting
- Shortcrete
- Light weight Concrete
- Mass concrete
- Fly-ash Concrete
- Fibre reinforced Concrete
- Polymer Concrete
- Ferro Reinforcement in concrete
- **Utilization of waste Material**
- Epoxy resins and screeds for rehabilitation- properties and application

Learning Outcomes:

At the end of this course the student will be conversant with

- Properties and application of admixture
- Mix Design
- Properties of concrete
- Awareness of modern technology
- Knowledge of special type of concrete

Assessment Model:

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

(a) Average of best Four quizzes out of all Six quizzes(25 Marks) - 25%
(b) Average of Two Mid-Terms (50 Marks) - 20%
(c) Attendance (5 Marks) - 5%
(d) End-Term (100 Marks) - 50%
(e) Lab work – 30 Marks
Total Assessment (Out of 130 Marks) – 100%

Preferred Reading:

1. Krishnaraju, N., Advanced Concrete Technology, CBS Publishers, 1985.
2. Nevile, A.M., Concrete Technology, Prentice Hall, Newyork, 1985.
3. A.R. Santhakumar, :Concrete Technology" Oxford University Press, 2006

Web Resources:

- http://www.wickipedia.ac
- www.sciencedirect.com
- http://engineeringcivil.com

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - **Geographic Information Systems for Resources Management**

Course Code: - **UCE-401**

L T P Cr
3 1 0 3.5

Objective: The Objective of this Course is to introduce students to the construction, Manipulation, Display and Analysis of spatial information using Geographic Information System(GIS)

COURSE DESCRIPTION

UNIT-I

Principles of GIS
Introduction to the basic Components and structure of GIS, Geographic concepts, Geographical Entities and Spatial data formats will be introduced.

UNIT-II
Intorduction to ArcGIS
Introduction to ArcGIS Software and its Components(ArcMap, ArcCatalog and ArcToolbox).

UNIT-III
Spatial data formats
Data Types, the differences between raster and vector formats, non-native data formats and metadata. Data analyses and function are highly dependent on these spatial data.

UNIT-IV
Map Projection
Overview of geographic coordinate systems and Map projections. Essention to geo-reference spatial data and superimpose spatial datasets

Spatial data Analysis;
An overview of multiple vector-based and raster-based (local, Focal, Zonal, and Global) spatial operations will be provided. Queries, The Field calculator, raster calculator and model maker provide operational tools to conduct spatial analize within the Arc GIS Environment.

Assessment Model:

(a) Average of best Four quizzes out of all Six quizzes(25 Marks) - 25%
(b) Average of Two Mid-Terms (50 Marks) - 20%
(c) Attendance (5 Marks) - 5%
(d) End-Term (100 Marks) - 50%
Total Assessment (Out of 100 Marks) – 100%

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Preferred Reading:

- Heywood L, Comelius. S and S. Carver (2006) An Introduction to Geographic Information System, Dorling Kinderseley (India) Pvt. Ltd.
- Burrough P A 2000 P A McDonnell (2000) Principles of Geographic Information Systems, London: Oxford University Press

Reference Book

Lo.C.P., Yeung. K.W Albert(2002) Concepts and Techniques of Geographic Information Systems, Prentice-Hall of India Pvt. Ltd. New Delhi

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - **URBAN TRANSPORTATION PLANNING**

Course Code: - **UCE-410**

L	T	P	Cr
3	1	0	3.5

Prerequisites: Surveying, Highway Engineering, Traffic Engineering

Objective:

- To acquaint the student with the principles and techniques of urban Transportation System Engineering
- The objective here is todevelop a general background so that the student understands the Traffic behavior and nature of traffic

Course Description

- **UNIT 1: Introduction**

Role of transportation in the economic development of nations, overview of transport modes, frowth trends, National transport policy of India – Case Studies, Transportation Planning in the developing world; and comparative international policies; Fundamental of transportation, Principles of Planning, evaluation, selection, adoption, financing, and implementation of alternative urban transportation systems; formulation of community goals and objectives, inventory of existing conditions; transportation modeling trip generation, distribution, modal choice, assignment

- **UNIT 2: Data collection and Inventories:**

Collection of data – Organization of surveys and Analysis, Study Areas, Zoning, Types and Sources of data, Road Side Interviews, Home Interviews Surveys, Commericial Vehicle Surveys, Sampling Techniques, Expansion Factors, Accuracy Checks, Use of Secondary sources, Economic data – Income – Population – Employment – Vehicle – Owner Ship

- **UNIT 3: Travel Demand Issues**

Trends, Overall Planning Process, Long term vs Short Term palnning, Demand Function, Independent variables, travel attributes, assumptions in Demand Estimation, Detailed approach on 4step travel demand estimation; Seuential and Simultaneous approaches, Aggregate and Disaggregate Techniques,

- **UNIT 4: Demand and Supply Planning:**

Planning for Sustainable urban mobility, positive and negative externalities in urban transport, congestion in pricing, parking policy, demand management , urban travel and transportation system characteristics – a systems perspective, Data management and us in making decisions, Demand analysis , Urban activity analysis , supply analysis; Plan Preparation and Evaluation , Travel Forecast to evaluate Alternative Improvements, Impacts of new Development on Transportation

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

facilities , Master plans, Selection of Corridor, Corridor identification, Corridor Deficiency Analysis

Learning Outcomes: On successful completion of this course students will:

- Understand the principle of traffic and Digital Signaling
- Understand the principles of LOS

Assessment Model:

(a) Average of best Four quizzes out of all Six quizzes(25 Marks) - 25%
(b) Average of Two Mid-Terms (50 Marks) - 20%
(c) Attendance (5 Marks) - 5%
(d) End-Term (100 Marks) - 50%
Total Assessment (Out of 100 Marks) – 100%

Preferred Reading:

- Introduction to Transportation Planning – MJ Bruton ; Hutchinson of London Ltd.
- Introduction to urban system planning –B.G.Hutchinson; Mc Graw Hill.
- Traffic Engineering and Transport Planning – Kadyali L.R. , Khanna Publishers
- Lectures notes on UTP- Prof. S. Raghavachari ,REC Warangal

Web Resources:

- www.wikipedia.org
- www.engineeringcivil.com

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name :- **Building Project and Estimates**

Course Code :- **UEC-412**

L	T	P	Cr
3	1	0	3.5

Prerequisites: Estimating and Costing, Rate Analysis

Objective:
This subject covers the various aspects of estimating of quantities of items of works involved in buildings, road works. This also covers the rate analysis, valuation of properties and prepration of reports for estimation of various items, At the end of this course the student shall be able to estimate the material quantities, Prepare a bill of quantities, make specifications and prepare tender documents. Student should also be able to prepare value estimates

Course Description

UNIT 1:

Procedure of Estimating Methods of Estimating ;Main item of work; Deduction for openings; Degree of accuracy. Methods of Building Estimates: Individual Wall Method; Center Line method; Arch masonary calculation

UNIT 2:

Estimate of RCC works Estimate of RC Slab ; RCC Beam; RCC T-beam slab and RCC coloumn with foundation, Road Estimating: Estimate of Earthwork; Estimate of Pitching of Slopes; Estimate of Earthwork of road from longitudinal sections; Estimate of Earthwork in hill roads Canal estimate : Earthwork in canals- Different cases; Breached sections/ Breach closures.

UNIT 3:

Specifications Purpose and Method of writing specifications; Detailed Specifications for Brickwork; RCC; Plastering; Mosaic Flooring; R.R Stone Masonary; Analysis of Rates; Preparing analysis of rates for the following items works:1)Concrete 2)RCC Works 3) Brickwork in foundation and superstructure 4) Plastering preparing leed statements.

UNIT 4:

PWD accounts and procedure of works: Organization of Engineering department; work charged establishment; Contract ; Tender; Tender Notice; Tender Schedule; Plinth Area;

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

FLOOR Area; Carpet Area; Approximate Estimate; Plinth Area estimate ; revised Estimate Supplementary estimate. Annual budgets of work, cash flow allocations yearly, TF Accounts of materials USR Valuation: Cost; Price & Value; Methods of Valuation; Out Goings: Depreciation; Methods for estimating cost depreciation; Valuation of Building.

UNIT 5:

Contracts ; Types of Contracts, Contract Law, EMD, Tenders, acceptance of contract, Branch of contract, Cancellation of contract, Re-tendering- work order , running pavement, Final Bill, Deviation orders, Completion Certificate

Learning Outcomes:

On successful completion of this course students will:

- Estimate various types of structures
- Able to make bill of various works

Assessment Model:

(a) Average of best Four quizzes out of all Six quizzes(25 Marks) - 25%
(b) Average of Two Mid-Terms (50 Marks) - 20%
(c) Attendance (5 Marks) - 5%
(d) End-Term (100 Marks) - 50%
Total Assessment (Out of 100 Marks) – 100%

Preferred Reading:

- Estimating & Costing in Civil Engineering by B.N. Dutta
- Valuation of real properties by S.C. Rangwal, Charotar Publishing House
- Estimating and Costing by M. Chakraborty , S chand publishing House

Web Resources:

- www.wikipedia.org
- www.engineeringcivil.com

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - **Engineering Drawing**

Course Code :- **UEG-101**

L	T	P	Cr
3	1	0	3.5

Objective: Disasters occur frequently in different parts of the world because of climate change. In fact, no place on this earth is free from disasters. India is highly disaster prone and suffers untold misery, irreparable damage to property and environment. At the present juncture of development-environment conflict, it is necessary to sensitize people to cope with suddenly changing situations.

Unit1

Understanding Disasters

Understanding the Concepts and definitions of Disaster, Hazard, Vulnerability, Risk, Capacity– Disaster and Development, Awareness During Disaster, Search and Rescue, needs Assessment and Disaster management.

Unit 2

Types of Disaster and its Control

- Geological Disasters (earthquakes, landslides, tsunami, mining);
- Hydro-Meteorological Disasters (floods, cyclones, lightning, thunder-storms, hail storms, avalanches, droughts, cold and heat waves);
- Biological Disasters (epidemics, pest attacks, forest fire); Technological Disasters (chemical, industrial, radiological, nuclear);
- Manmade Disasters (building collapse, rural and urban fire, road and rail accidents, nuclear, radiological, chemicals and biological disasters);
- Global Disaster Trends–Emerging Risks of Disasters–Climate Change and Urban Disasters.

Unit 3

Disaster Management in India

- Disaster Profile of India –Mega Disasters of India and Lessons Learnt Disaster Management Act 2005 –Institutional and Financial Mechanism National Policy on Disaster Management, National Guidelines and Plans on Disaster Management;
- Role of Government (local, state and national),
- Non-Government and Inter-Governmental Agencies

Unit 4

Applications of Science and Technology for Disaster Management

- Geo-informatics in Disaster Management (GIS, GPS and RS)
- Disaster Communication System (Early Warning and Its Dissemination)

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

- Land Use Planning and Development Regulations Disaster Safe Designs and Constructions in India

Learning Outcomes: Students will be able to understand,

- Behavior of building during earthquake
- Able to find the critical element of building
- Knowledge of repair of critical element

Assessment Model:

(a) Average of best 6 quizzes out of all the 4 quizzes(20 Marks) - 25%
(b) Average of Two Mid-Terms (50 Marks) - 20%
(c) Attendance – 5 %
(d) End-Term (100 Marks) - 50%
Total Assessment (Out of 100 Marks)

Preferred Reading:

- Pankaj Aggarwal and Manish Shrikande, "Earthquake resistant design of structures"
- S.K.Duggal, "Earthquake resistant design of structures", Oxford University Press
- Ulrich ranke, "Natural Disaster Risk Management: Geosciences and Social Responsibility"
- Michael Beach , "Disaster Preparedness and Management"
- Rajesh Anand,N.C.Jana,Sudhir Singh, "Disaster Management and Sustainable Development Emerging issues and concerns"
- B C Bose, "Introduction to Disaster Management"
- Relevant codes

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: -Advance Construction Techniques and Project Management

Course Code: -UCE-312

L T P Cr
3 1 0 3.5

- **UNIT - 1:** : Introduction
  - Materials - Modular co-ordination, standardization and tolerances-system for prefabrication.
  - Pre-cast concrete manufacturing techniques
  - Moulds –construction design, maintenance and repair
- **Unit 2:** Construction Techniques:
  - Pre-casting techniques - Planning, analysis and design considerations
  - Handling techniques -Transportation Storage and erection of structures.
- **UNIT 3:CPM**
  - Introduction
  - Network techniques, work break down
  - Classification of activities, rules for developing networks, network development-logic of network, allocation of time to various activities
  - Fulkerson's rule for numbering events, network analysis ,determination of project schedules, critical path, ladder construction, float in activities, shared float, updating
  - Resources allocation, sources smoothing and resources leveling.

PERT:

- Probability concept in network, optimistic time, pessimistic time, most likely time, lapsed time, deviation, variance, standard deviation, slack critical path, probability of achieving completion time, central limit theorem.

- **UNIT 4: Cost-Time Analysis:**
  - Cost versus time, direct cost, indirect cost, total project cost and optimum duration
  - Contracting the network for cost optimization, steps in time cost optimization, illustrative examples.

Inspection & Quality Control:

- Introduction
- Principles of inspection
- Enforcement of specifications
- Stages in inspection

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

- Quality control and testing of structures
- Statistical analysis.
- Statistical analysis.

Learning Outcomes:
At the end of this course the student will be conversant with

- Properties and application of admixture
- Mix Design
- Properties of concrete
- Awareness of modern technology
- Knowledge of special type of concrete

Assessment Model:

(a) Average of best Four quizzes out of all Six quizzes(25 Marks) - 25%
(b) Average of Two Mid-Terms (50 Marks) - 20%
(c) Attendance (5 Marks) - 5%
(d) End-Term (100 Marks) - 50%
(e) Lab work – 30 Marks
(f) Total Assessment (Out of 130 Marks) – 100%

Preferred Reading:

a. Krishnaraju, N., Advanced Concrete Technology, CBS Publishers, 1985.
b. Nevile, A.M., Concrete Technology, Prentice Hall, Newyork, 1985.
c. Construction Planning &Management by P.S. Gehlot&B.M.Dhir
d. PERT & CPM -Principles & Applications by L.S.Srinath

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Advanced Environmental Engineering

Course Code: -UCE-365

L T P Cr

3 1 0 3.5

UNIT - 1:

ADVANCED WASTEWATER TREATMENT: Need for advanced wastewater treatment, process selection, granular- medium filtration, micro screening, control of nutrients, combined removal of nitrogen and phosphorus by biological methods, removal of toxic compounds and refractory organics, removal of dissolved inorganic substances, natural treatment systems- floating aquatic plant treatment systems.

UNIT - 2

AIR AND WATER QUALITY MONTORING: Design of air monitoring survey network, siting criteria, models for monitoring site selection, principles and techniques for ambient and stack sampling, acquisition and analysis of monitored data, BIS methods. Monitoring of water quality, planning sampling networks and schedules, sample collection and analysis, presentation and interpretation of results, methods and instruments for monitoring water pollutants, standards.

UNIT - 3

ENVIRONMENTAL MODELLING AND SIMULATION: Principles of modeling and simulation, classification, introduction to air quality models, air pollution meteorology, impact on local and global climate, atmospheric stability, Gaussian models and modifications. Introduction to river, estuaries and lake hydro dynamics, dissolved oxygen models, eutrophication and nutrient-phytoplankton models, toxic substance models, temperature models, models for management applications.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

UNIT – 4:

RESOURCES AND ENERGY RECOVERY FROM SOLID WASTE: Processing techniques, material recovery systems, recovery of biological conversion products, recovery of thermal conversion products, recovery of energy from conversion products, materials and energy recovery systems.

Learning Outcomes:
At the end of this course the student will be conversant with

- The introduction of Waste Water and their treatment
- Advanced Treatments for Air and Water Pollution

Assessment Model:

- (a)Average of best Four quizzes out of all Six quizzes(25 Marks) - 25%
- (b) Average of Two Mid-Terms (50 Marks) - 20%
- (c) Attendance (5 Marks) - 5%
- (d) End-Term (100 Marks) - 50%
- Total Assessment (Out of 100 Marks) – 100%

Ref Books:-

- Waste water Engineering- treatment and Reuse (Fourth Edition) : Metcalf & Eddy Inc: Tata McGraw Hill
- Air Monitoring Survey Design K.E. Noll & T.L. Miller : Ann Arbor Science
- Air Pollution Control Engineering (Second Edition): N.D. Nevers: McGraw Hill

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - ENERGY MANAGEMENT

Course Code: - UEE-403

L T P Cr
3 1 0 3.5

Unit-I

INTRODUCTION
Review of different Energy Sources Concept of Energy Management, supply side management, demand side management, Energy crisis, Energy Efficiency, Energy Scenario in India and its Conservation program, Computer Aided Energy Management System

ENERGY CONSERVATION
Energy Conservation needs and Objectives, Energy Conservation in Domestic sector, Energy Conservation in Industrial sector.

Unit-II

ENERGY AUDIT
Need for Energy Audit, Types of Energy Audits, National Energy Plan and its impact on Energy Conservation, Energy audit team, Energy Audit Reporting format, Energy Audit Instruments.

Unit-III

ENERGY EFFICIENT TECHNOLOGY
Life cycle assessment, Energy efficient Motors, BIS Specifications for Energy Efficient Motors, Energy Efficient lighting sources, Power Quality

Unit-IV

ENERGY AUDITS PRACTICE
Energy Audits of building systems, electrical systems, maintenance and Energy Audits.

Recommended Books

1. Handbook of Energy Audits by Albert Thuman – Fairman Press Inc.
2. Energy basis for man and nature by Howard T.Odum & Elisbeth C.Odum.
3. Energy Management by Umesh Rathore, Kataria Publications

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - NON CONVENTIONAL ELECTRICAL POWER GENERATION

Course Code:-UEE-452

L T P Cr
3 1 0 3.5

Unit-I

Energy situation and renewable energy sources: Global Energy scenario, World Energy consumption, Energy in developing countries, fire wood crisis, Indian energy scene, Non conventional renewable energy sources, potential of renewable energy sources.

Unit-II

Wind Energy: Origin of wind, Basic principle of wind energy, conversion, component of wind energy conversion system, type of windmills, Wind electrical Generations in India.
Solar Energy: Introduction, solar radiation, solar energy collector, solar thermal power generation, low temperature application of solar energy.

Unit-III

Geo-thermal Power Plants: Introduction, Geothermal sources, comparison of Geo thermal energy with other energy forms, development of Geothermal power in India. Physical and thermochemical methods of bioconversion: Introduction, biomass definition and potential, physical method of bio conversion, thermo chemical methods.

Unit-IV

Wave, Tidal and OTEC: Introduction, Basic principle of tidal power, Wave energy, component of Tidal power plant, Ocean Thermal Energy Conversions, advantages and disadvantages of tidal power generation. Small and Mini Hydro power System: Introduction, site development, generation and electrical equipment, system of regulation of Hydroelectric Power in India.

Recommended books :-

1. Renewable Energy Sources by Maheshwar Dyal.
2. Small and mini Hydropower system by Tata Mc Graw Hill.
3. An Introduction to power plant technology by G.D.Rai.
4. Solar Energy by Suhas.P.Sukhatma, Tata Mc Graw Hill.
5. Modern Power Plant Engg. by Joel

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - **TRANSFORMER ENGINEERING**

Course Code: - **UEE 457**

L T P Cr
3 1 0 3.5

Unit 1

Introduction to Transformers

Transformer Types, Transformer Losses,Operating Principles, Instrument Transformers, Transformer Construction, Auto -Transformer,Transformer connections.

Transformer Maintenance

Insulation Testing, High Potential Testing, Turns Ratio Testing, Polarity Testing, Power Factor, Excitation Current, DC Winding Resistance, Polarization Recovery, Insulating Fluid, Dielectric, Dissolved Gas Analysis.

Unit 2

Materials for Transformers

Insulating oil, insulating paper, pressboard, and wood, insulated copper conductor for windings, crepe paper, sealing materials, and cold – rolled grain oriented electrical steel sheet.

Winding and Insulation

Types of windings, surge voltage, heat transfer, insulation design.

Unit 3

Cooling

Air Cooled Oil-Immersed,Water-Cooled, Forced-Oil Cooling,Self-Cooling with Air BlastTemperature Limits, Transformer loading.

Magnetic Circuit

Materials, design of magnetic circuit, optimum design of core.

Unit 4

Tap Changers

Off - circuit tap changer, on load tap changer, automatic control of tap changer.

Transformer Auxiliaries

Buchholz relay, temperature indicators, oil level indicators, oil preservation systems.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

BOOKS/REFERENCES:

1) Transformers by BHEL, Bhopal, Tata McGraw Hill.
2) Transformer Engineering by SV Kulkarni and SA Khaparde Marcel & Dekks Inc.
3) Transformer Engineering design and practices, SV Kulkarni, SA Khaparde,Marcel Dekker IncNew york.
4) Electrical Machines byJ. Nagrath&D.P.Kothari, Tata McGraw Hill
5) Electrical Machines by Husain Ashfaq ,DhanpatRai& Sons
6) Electric Machine and Tranformers by Irving L.Kosow, Prentice Hall of India.
7) Fundamentals of Electrical Machines by B.R. Gupta &VandanaSinghal, New Age International
8) The Performance and Design of DC machines by A.E. Clayton, Pitman &Sons
9) The Performance and Design of AC machines by M.G. Say, Pitman & Sons
10) Theory of Alternating Current Machinery by Langsdorf , Tata McGraw Hill.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - DIRECT ENERGY CONVERSION

Course Code: - UEE-411

L	T	P	Cr
3	1	0	3.5

Unit-I

INTRODUCTION: Conventional generation (Thermal, Hydro etc) alternative generation processes

THERMIONIC GENERATION: The basic thermionic diode generator and its analysis, Cross held devices, Anode and cathode materials, Experimental thermionic generator.

Unit-II

MHD GENERATION: Principles of MHD generation, electrical conditions, Faraday generator, Hall generator, comparison of generators, choice of generator parameters, other generator configurations.

EXPERIMENTAL MHD GENERATION: Open cycle working, closed cycle operation, Liquid metal systems..

Unit III

THERMOELECTRIC GENERATION: Seeback effect, Peltier effect, Thomson effect, EMF relationship, Generator analysis, Material selection, Experimental thermoelectric generation.

Unit IV

FUEL CELLS: Principles of fuel cells, Thermodynamics of the fuel cell, Choice of fuels and operating condition, Polarization and its effect, Redox cell, Overall efficiency, Practical Fuel cells – various types.

Recommended Books:

1. Direct Energy Conversion by R.A.Coombe.
2. Non-Conventional Energy Sources By –S.Rao.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - HYDRO POWER STATION DESIGN

Course Code: - UEE-456

L T P Cr
3 1 0 3.5

Unit-I

Introduction, Hydrology, Stream flow, Hydrographs, Flow duration curves, Mass curve, Storage, Investigation of site.

Unit-II

Types of dams, arrangement and location of hydro-electric station, types of hydroelectric plants and their fields of use, principle of working of a hydroelectric plant.

Unit-III

Power to be developed, size of plant and choice of units, Types of turbines and their characteristics, Design of main dimensions of turbines.

Unit-IV

Draft tubes, Turbine setting, penstock dimensions, scroll case, preliminary design of penstock, characteristics of generators. Various design aspects of mini and micro hydel plants.

Recommended books

1. Power Station Design by M.V.Deshpande.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - ILLUMINATION ENGINEERING

Course Code: - UEE-408

L	T	P	Cr
3	1	0	3.5

Unit-I

Introduction: Laws of illumination - Inverse Square law and Lambert's Cosine law, their application in lighting calculations.brief idea of methods of Lighting calculations. General Principles Of Illumination: Definitions, units of light, definitions of flux, solid angles, luminous intensity and brightness, glare, polar curves.

Unit-II

COLOUR: Nomenclature of colour, production of colored light and mixing colours, colours contrast, colour matching. Electric Light Sources: Brief description of characteristics of starting and application of the following lamps:a) Incandescent lamp.b) Sodium Vapour lamp. c) Mercury Vapour lamp d) Flourescent lamp e) Neon lamp

Unit-III

General Illumination Design (LUMEN METHOD): Room index and Utilization factor, Maintenance factor, types of lighting schemes, design of lighting schemes with practical examples. Minimum level of illumination required for:

(i) Domestic. (ii) Commercial (iii) Educational. (iv) Health (v) Industrial buildings. flood lighting of building, road lighting factory lighting.

Unit-IV

Maintenance and Economics: Maintenance of luminaire, luminaire depreciation caused by dust and dirt, Efficient light production, lighting economics. Instruments used in photometric measurements.

Recommended Books

1. NPTEL Notes
2. Utilization Of Electric Power and Electric Traction by: J.B.GUPTA

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Biomedical Instrumentation

Course Code: - UEC-462

L T P Cr

3 1 0 3.5

Unit-I

Introduction to Biomedical Signals Tasks in Biomedical Signal Processing, Computer Aided Diagnosis, Examples of Biomedical signals: ECG, EEG, EMG etc., Review of linear systems, Fourier Transform and Time Frequency Analysis (Wavelet) of biomedical signals, Processing of Random & Stochastic signals, spectral estimation, Properties and effects of noise in biomedical instruments, Filtering in biomedical instruments

Unit-II

Cardio-logical Signal Processing Pre-processing, QRS Detection Methods, Rhythm analysis, Arrhythmia Detection Algorithms, Automated ECG Analysis, ECG Pattern Recognition, Heart rate variability analysis.

Unit-III

Adaptive Noise Canceling Principles of Adaptive Noise Canceling, Adaptive Noise Canceling with the LMS adaptation, Algorithm, Noise Canceling Method to Enhance ECG Monitoring, Fetal ECG Monitoring.

Unit-IV

Neurological Signal Processing Modeling of EEG Signals, Detection of spikes and spindles, Detection of Alpha, Beta and Gamma Waves, Auto Regressive (A.R.) modeling of seizure EEG, Sleep Stage analysis, Inverse Filtering, Least squares and polynomial modeling.

Reference Books:

1. D.C.Reddy,―Biomedical Signal Processing: Principles and techniques‖, Tata McGraw Hill, New Delhi, 2005.
2. Willis J Tompkins, Biomedical Signal Processing, Prentice Hall, 1993
3. R. Rangayan, ―Biomedical Signal Analysis‖, Wiley 2002.
4. Bruce, ―Biomedical Signal Processing & Signal Modeling,‖ Wiley, 2001.
5. K. Najarian and R. Splinter, ―Biomedical Signal and Image Processing‖, Second Edition, The CRC Press.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - TELEVISION ENGINEERING

Course Code: - UEC-463

L T P Cr
3 1 0 3.5

UNIT I

PRINCIPLES OF TV:
Picture elements, Theory of line, frame and field frequencies Blanking, Synchronization, interfacing, resolution, vertical resolution, horizontal resolution and video bandwidth, Use of AM in video and FM in audio, Block Diagram of TV Transmitter and Receiver, Construction of composite video signal.

UNIT II

TELEVISION CAMERAS AND PICTURE TUBES:
Spectrum of light and eye response, Image orthicon, plumbicon, vidicon (Principles of operation, Construction and working),TV picture tube details, Modulation system used for sound and picture, VSB working, TV transmitter.

UNIT III
TV RECEIVER:
Block Diagram of TV Receiver, Tuner Circuits, Choice of IF amplifier, A.M. & F.M. detectors, Receiver sweep circuits, Video Frequency amplifier, synch. Pulse representation, deflection circuits.

UNIT IV

COLOUR TV:
Hue, Saturation and luminance, Luminance and colour signal generation, Types of colour picture tubes (Basic principles and construction), colour subcarrier and colour triangle, NTPC, PAL, SECAM systems, Colour TV transmission & reception, Block Diagram of digital TV with merits.

REFERENCE BOOKS:

- Monochrome & Colour TV: R.R Gulati: New Age Pub.
- Basic Television: G.M Grob: McGraw Hills
- T.V. Engg: Dhake: Tata McGraw Hills

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Satellite Communication

Course Code: - UEC-464

L T P Cr
3 1 0 3.5

Unit-I

Introduction to Satellite Communication Origin, Brief History, Current state and advantages of Satellite Communication, Active & Passive satellite, Orbital aspects of Satellite Communication, Angle of Evaluation, Propagation Delay, Orbital Spacing, System Performance

Unit-II

Satellite Link Design Link design equation, system noise temperature, C/N & G/T ratio, atmospheric & econospheric effects on link design, complete link design, interference effects on complete link design, earth station parameters, Earth space propagation effects, Frequency window, Free space loss, Atmospheric absorption, Rainfall Attenuation, Ionospheric scintillation, Telemetry, Tracking and command of satellites.

Unit-III

Satellite Multiple Access System FDMA techniques, SCPC & CSSB systems, TDMA frame structure, burst structure, frame efficiency, super-frame, frame acquisition & synchronization, TDMA vs FDMA, burst time plan, beam hopping, satellite switched, Erlang call congestion formula, DA-FDMA, DA-TDMA.

Unit-IV

Satellite Services INTELSAT, INSAT Series, VSAT, Weather forecasting, Remote sensing, LANDSAT, Satellite Navigation, Mobile satellite Service.

Unit-V

Laser & Satellite Communication Link analysis, optical satellite link Tx & Rx, Satellite, beam acquisition, tracking & pointing, cable channel frequency, head end equation, distribution of signal, n/w specifications and architecture, optical fibre CATV system.

Reference Books:

1. Trimothy Pratt, Charles W. Bostian,-Satellite Communications‖, John Wiley & Sons, 1986.
2. Dr. D.C. Aggarwal, ―Satellite Communications‖, Khanna Publishers, 2001.
3. Dennis Roddy, ―Satellite Communications‖, McGraw Hill, 1996.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: -DIGITAL SIGNAL PROCESSING & APPLICATIONS
Course Code:-UEC-465

L T P Cr
3 1 0 3.5

Unit–I

Classification of signals, singularity functions, classification of system, manipulation of Discrete time signals: Signal analysis, signal characteristics, typical discrete time signals, operation on signals, properties of linear time-invariant digital systems, sampling of analog signals and sampling rate conversion. Z-transform; Properties of Z-transform. Inverse Z-transform – analysis of discrete time systems, convolution.

Unit – II

System function, difference equation, IIR filter design: Analog filter approximation, Butter worth, Chebyshev and Elliptic filters, Bilinear transformations, Impulse invariance technique, Digital frequency band transformations. FIR filter design: Window technique, Equiripple approximation technique, Frequency sampling technique.

Unit – III

Discrete Fourier Transform (DFT) and Inverse Discrete time Fourier Transform: properties of DFT (circular convolution). Fast Fourier Transform (FFT): Decimation-in-time (DIT) algorithm-decimation-in-frequency algorithm-FFT, Radix-2 DIT and DIF implementation.

Unit – IV

Applications of DSP in Voice, RADAR and Image Processing. *TMS320CXX* SERIES PROCESSORS: Architecture, Memory, Interrupts, Addressing modes, Assembly language programming.

REFERENCE BOOKS:

1. *Digital Signal Processing David.K.Defatta, Joseph G, Lucas & William S.Hodgkiss John Wiley & sons*
2. *Digital Signal Processing Sanjit K and Mitra Tata McGraw Hill*
3. *Digital Signal Processing- Principles, Algorithms & Applications John G. Proakis & Dimitris Manolakis Pearson Education*
4. *Digital Signal Processing A.V.Oppenheim & R.W.Schaffer Prentice Hall*
5. *Digital Signal Processing Farooq Hussain Prentice Hall*
6. *Digital Signal Processing Salivahanan, Vallavaraj & Gnanapriya Tata McGraw Hill*
7. *Digital Signal Processing J.S. Chitode Technical Publication Pune*

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - OPTICAL COMMUNICATION
Course Code :- UEC-466

L	T	P	Cr
3	1	0	3.5

UNIT I

Need for Fiber Optic Communications System, Role of Fiber Optic communication technology, Basic Block Diagram, Advantages & Disadvantages of Optical Fiber Communication, structure of optical wave guide, light propagation in optical fiber using ray theory, Electromagnetic Mode Theory, Step Index Fiber, Graded Index Fiber, Attenuation- Bending Loses, Scattering, Absorption, Dispersion – Intermodal, Chromatic, limitations & remedies.

UNIT II

Light sources & Transmitters – Light Emitting Diodes, Hetero junction & DH structure, laser diodes, Principle of action, characteristics, efficiency, Block Diagram and typical circuits of Transmitter.

UNIT III

Receivers, Photodiodes -Working, Power relationship, PIN photodiodes, Avalanche photodiode, Block Diagram & typical circuits of receiver.

UNIT IV

Fiber Cable Connection– Splicing, Connectors, components of Fiber Optic Networks, Transceivers, Semiconductor, optical amplifiers - Principle of operation, Gain, Bandwidth, Cross talk, Noise, Applications, Advantages & Disadvantages. Erbium Doped Fiber Amplifiers (EDFAs) - Operation, gain, noise, Components of EDFA module.

REFERENCE BOOKS:

- Fiber Optic Comm. Systems D.K.Mynbaev Pearson Edu.
- Optical Fiber Comm. John M.Senior PHI Publications
- Optical Fiber Comm. G.Keiser TMH

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Principles of Digital Communication
Course Code: - UEC-467

L T P Cr
3 1 0 3.5

UNIT-I

PULSE MODULATION:- Sampling process, pulse – amplitude modulation , other forms of pulse modulation, Bandwidth – noise trade off, quantization process, pulse code modulation, noise considerations in PCM system, ISI & Eye pattern in PCM, Time- division multiplexing, digital multiplexers, differential pulse code modulation , delta modulation, Adaptive Delta Modulation.

UNIT-II

DIGITAL MODULATION TECHNIQUES: - Binary phase – shift keying, differential phase shift keying, differentially – encoding PSK (DEPSK), Quadrature phase shift keying (QPSK), M-ary PSK, Amplitude shift keying(ASK), Quadrature amplitude shift keying (QASK). Binary frequency shift keying, similarity of BFSK and BPSK, M-ary FSK, Minimum shift keying (MSK)

UNIT-III

DATA TRANSMISSION: - A base band signal receiver, probability of error, the optimum filter, white noise: the matched filter, probability of error of the matched filter, coherent reception: correlation, phase shift keying (PSK), frequency shift keying (FSK), Non coherent detection of FSK, differential PSK,).

UNIT-I V

SPREAD SPECTRUM MODULATION: - Pseudo-noise sequences, direct sequence spread spectrum, processing gain, frequency HOP spread spectrum, Linear Block Codes, Convolution codes.

REFERENCE BOOKS :-

- Communication System: Simon Haykins:John Wiley
- Principles of Communication System: Taub and Schilling:TMH
- Electronics Communication System : Wayne Tomasi: Pearson Edu.
- Information Theory Coding and Cryptography: Ranjan Bose : TMH
- Communication Systems Analog and Digital : Sanjay Sharma: Katson Books

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Basic Manufacturing Technology

Course Code :- UME-410

L T P Cr

3 1 0 3.5

Unit – I

Metal Casting Processes: Advantage and limitations, sand mold making procedure, Patterns and Cores. Pattern materials, pattern allowances, types of pattern, colour coding, Molding material, Molding sand composition, and preparation, sand properties and testing type of sand molds.**Cores:** Types of cores, core prints, chaplets, chills, Gating systems, Gates and gaiting systems risers, Melting practice, Cupola, charge calculations. Casting cleaning and casting defects Fettling, defects in castings and their remedies, methods of testing of castings for their soundness.

Unit – II

Special Casting Processes: Shell molding, precision investment casting, permanent mold casting, die casting, centrifugal casting, continuous casting.
Metal forming Processes: Nature of plastic deformation, hot working and cold working. Principles of rolling, rolling mills Forging: Forging operations, smith forging, drop forging, press forging, forging defects.

Unit – III

Extursion and other processes : Extrusion principle, hot extrusion, cold extrusion, wire drawing, swaging, tube making, Sheet metal operation, shearing action, drawing dies, spinning, bending, strech forming, embossing and coining.
Gas and Arc Welding: Classification: Oxy-acetylene welding equipment and techniques. Electric arc welding: Electrodes, manual metal arc welding, inert gas shielding arc welding, tungsten inert gas welding (TIG), metal inert gas wedling (MIG), submerged arc welding (SAW)

Unit – IV

Resistance Welding: Principles, resistance sopt welding, resistance seam welding, upset welding, flash welding.
Other Welding Processes : Introduction thermit welding, electro slag welding, electron beam welding, laser beam welding forge welding, friction welding, diffusion welding, brazing and Soldering.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Text Books:

1. Principles of Manufacturing Materials & Processes –Campbell J.S.Publisher–Mc Graw Hill.
2. Manufacturing Science – Ghosh A.Malik, A.K.Affiliated East-West Press Pvt. Ltd., New Delhi.
3. Foundary Technology – K.P.Sinha, D.B.Goel, Roorkee Publishing House.
4. Welding and Welding Technology, Richard L.Little Tata McGraw Hill Ltd.
5. Principle of Metal casting- Rosenthal, Tata Mc Graw hill, New Delhi.
6. Production Technology – R.K.Jain, Khanna Publication Ltd., N D.
7. Manufacturing Processes and Systems : Ostwald Phillip F., Munoz Jairo, John Wiley & Sons (Asia) Pvt. Ltd.
8. Welding Technology – O.P.Khanna, Dhanpat Rai & Sons, Delhi.

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Human Values and Professional Ethics

Course Code :- UMG-476

L	T	P	Cr
3	1	0	3.5

Prerequisites: PEEM

Objective:

Today, more and more organizations are realizing the importance of practiseing ethics in their business dealings and the engineering profession is no exception to this. For, any policy or practice that gives a go-by to professional ethics which essentially entails fair and transparent dealings based on sound moral principles cannot enjoy the confidence of the customer for long. It is in this context that a book on Professional Ethics is very significant.

COURSE DESCRIPTION

UNIT – I

Introduction –Need, Basic Guidelines and Content:
Understanding the need , basic guidelines, content and process for value Education Self Exploration – What is it? – its content and process: 'Natural Acceptance' and Experiential Validation – as the mechanism for self explanation Continuous Happiness and Prosperity – A look at basic Human Aspirations

UNIT – II

Process for Value Education:
Right Understanding, Relationship and Physical Facilities – basic requirements for fulfillment of aspirations of every human being with their correct priority Understanding Happiness and prosperity correctly – A critical appraisal of the current scenario Method to fulfill the above human aspirations; understanding and living in harmony at various levels

UNIT – III

Understanding Harmony in the Human Being:
Understanding human being as a co-existence of the sentient 'I' and the material 'Body' Understanding the needs of Self ('I') and 'Body' – Sukh and Suvidha Understanding the Body as an instrument of 'I' (I being the doer, seer and enjoyer)

UNIT – IV

Harmony in Myself:
Understanding the characteristics and activities of 'I' and harmony in 'I' Understanding the harmony of I with the Body: Sanyam and Swasthya: correct appraisal of Physical needs, meaning

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

of Prosperity in detail. Programs to ensure Sanyam and Swasthya – practice exercises and Case Studies will be taken up in Practice Sessions relationship.

Assessment Model:

(a) Average of best Four quizzes out of all Six quizzes(25 Marks) - 25%
(b) Average of Two Mid-Terms (50 Marks) - 20%
(c) Attendance (5 Marks) - 5%
(d) End-Term (100 Marks) - 50%
(e) Total Assessment (Out of 100 Marks) – 100%

Reference Books

i. R R Gaur, R,Sangal, G.P Bagaria, 2009, A Foundation Course in value Education(English)
ii. Pradeep Kumar Ramancharla, 2013, A foundation course in value education (Telugu)
iii. R R Gaur, R Sangal G P Bagaria, 2009, Teacher's Manual (English)
iv. Pradeep Kumar Ramancharla, 2013, Teacher's Manual (Telugu)

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Course Name: - Total Quality Management

Course Code: - UMG-475

L T P Cr
3 1 0 0

Objective

Total Quality Management refers to an integrated approach by management to focus all the functions and levels of an organization on quality and continuous improvement. Over the years, total quality management has become very important for improving a firm's processing capabilities in order to sustain competitive advantages.

Unit-I

Introduction to TQM & ISO 9000, Total Quality Control, Customer Focus & Total waste Elimination (TWE), Quality Assurance. **04** Quality of Design & Development, Inspection & Measurement workforce Teams, Benchmarking, TQM for Sales Marketing Management.

Unit-II

Business Process Re-engineering & Information Technology, Quality control SQC/ SPC, Technology & Product Quality, Quality for After Sales Services Technology & Product Quality.

Unit-III

Organization for Quality, Reliability as quality characteristics, Quality leadership, Quality linked productivity, Total Quality, Culture, Quality and environment, Cost of Quality.

Unit-IV

Cost of Quality, Quality Control for Export Units, Quality Maturity and Discipline, Total commitment for Quality, TQM Implementation, ISOm 9000 series of standards, ISO 9000-1, ISO 9000-2, ISO 9000-3. **08**

Assessment Model:

(a)Average of best Four quizzes out of all Six quizzes(25 Marks) - 25%
(b) Average of Two Mid-Terms (50 Marks) - 20%
(c) Attendance (5 Marks) - 5%
(d) End-Term (100 Marks) - 50%
Total Assessment (Out of 100 Marks) – 100%

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.

Text Books:-

1. TQM & ISO 14000: K.C.Arora.
2. Total Quality Control: Armand V. Feigenbaum.
3. Total Quality Management: Joseph.A.Patrick, Diana.S.Furr.
4. Total Quality Management – Text: Joel E. Ross Cases &Readin
5. Total Quality Control Essentials: Sarv Singh Soin

Note for End Term Examination: Attempt five questions in all, selecting one question each from the sections A, B, C and D. Section E is compulsory.