## Scheme of Teaching and Examination
### B.E. (E&E) IV SEMESTER
(Academic Year 2013-14)

<table>
<thead>
<tr>
<th>SL No</th>
<th>Subject Code</th>
<th>Subject</th>
<th>C</th>
<th>Hours/Week</th>
<th>Examination Marks</th>
</tr>
</thead>
<tbody>
<tr>
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<td>L</td>
<td>T</td>
<td>P</td>
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<tr>
<td>01</td>
<td>UMA401C</td>
<td>Engineering Mathematics-IV</td>
<td>4</td>
<td>4</td>
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</tr>
<tr>
<td>02</td>
<td>UEE412C</td>
<td>Object Oriented Programming with C++</td>
<td>4</td>
<td>4</td>
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<tr>
<td>03</td>
<td>UEE413C</td>
<td>Signals &amp; Systems</td>
<td>4</td>
<td>4</td>
<td>--</td>
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<tr>
<td>04</td>
<td>UEE414C</td>
<td>Operational Amplifiers and Linear IC's</td>
<td>4</td>
<td>4</td>
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<tr>
<td>05</td>
<td>UEE415C</td>
<td>Transformers and Induction Machine</td>
<td>4</td>
<td>4</td>
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</tr>
<tr>
<td>06</td>
<td>UHS416C</td>
<td>Management and Entrepreneurship</td>
<td>3</td>
<td>3</td>
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<tr>
<td>07</td>
<td>UEE417L</td>
<td>Analog Electronics &amp; Linear IC's Lab</td>
<td>1.5</td>
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<tr>
<td>08</td>
<td>UEE418L</td>
<td>Transformer and Induction Machine Lab</td>
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<tr>
<td>09</td>
<td>UMA001M</td>
<td>Advanced Mathematics-I</td>
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<td>4</td>
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<tr>
<td>10</td>
<td>UHS226M</td>
<td>Constitution of India</td>
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<td>2</td>
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**Total** 26 29 -- 6 500 500 1000

**Advanced Mathematics –I** is a mandatory subject only for students admitted to 3rd Semester through lateral entry scheme. (Diploma quota)
Passing the subject is compulsory, however marks will not be considered for awarding grade /class. A PP/NP grade will be awarded for passing/not passing the subject.

**Constitution of India** is a mandatory subject for lateral entry students. Question Paper will be of Objective type. Students have to pass the subject compulsorily, however marks will not be considered for awarding Grade / Class / Rank.

<table>
<thead>
<tr>
<th>Legend for Scheme</th>
<th>L</th>
<th>Lecture</th>
<th>T</th>
<th>Tutorial</th>
<th>P</th>
<th>Practical</th>
<th>M</th>
<th>Mandatory</th>
</tr>
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<tbody>
<tr>
<td>Legend in Subject code</td>
<td>C</td>
<td>Core</td>
<td>E</td>
<td>Elective</td>
<td>C</td>
<td>Credits</td>
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</table>
Prerequisite

Unit-I

01. COMPLEX VARIABLES: 14 Hours
Analytic functions, Cauchy-Reimann equations in Cartesian and Polar forms - consequences, construction of analytic function (Cartesian and polar forms), Definition of Conformal transformations: \( z^2 \), \( e^z \) and \( z+a^2/z \) \((z=0)\) Bilinear transformations.

02. COMPLEX INTEGRATIONS:
Line integral, Cauchy's theorem - corollaries, Cauchy's integral formula. Taylor and Laurent's series (statements only), Singularities, Poles, Calculation of Residues, Residue theorem (Without proof) – problems. Contour integration

Unit-II

03. SPECIAL FUNCTIONS: 14 Hours
Series solution of ordinary differential equations about ordinary point and regular singular point, Hypergeometric, Hermite, Legendre, Bessel and Chebeschev equations. Recurrence formulae, Generating function, orthogonal property, Rodrigue's formula.

Unit-III

04. STATISTICS AND PROBABILITY: 12 Hours
Curve fitting by the method of least squares: \( y=a+bx \), \( y=ab^x \), \( y=a+bx+cx^2 \), Correlation and Regression. Probability - addition rule, conditional probability, multiplication rule, Bayes' rule.
Discrete and continuous random variables - PDF-CDF, Binomial, Poisson, and Normal distributions

Unit-IV

05. SAMPLING DISTRIBUTION: 12 Hours
Sampling, Sampling distribution, Standard error, Null and alternate hypotheses, Type I and Type II errors, Testing of hypothesis for Means, Level of Significance for Means, Confidence limits for Means, large and small samples, Student's t-distribution. Central limit theorem (without proof)

06. JOINT PROBABILITY DISTRIBUTION AND MARKOV CHAINS:
Concept of joint probability, Joint distributions - discrete random variables, Independent random variables, Markov chains, higher transition probabilities, stationary distribution of regular Markov chains and absorbing states.

Text Books:

Reference Books:

Question paper pattern for SEE:
1. Total of eight questions with two from each unit to be set uniformly covering the entire syllabus.
2. Each question should not have more than 4 sub divisions.
3. Any five full questions are to be answered choosing at least one from each unit.
OBJECT ORIENTED PROGRAMMING WITH C++

Subject Code: UEE412C  SEE Marks: 100
Credits: 04  Exam Duration: 03 Hours

Prerequisite

Unit -I

01. Principles of Object-Oriented Programming:  05 Hours

02. Basic Language C++:  08 Hours
Comparison of C and C++, structure of C++ program with class, preprocessor directives, C++ statements input/output, comments, tokens, keywords, identifiers, constants, data types-string, pointer, reference, boolean, enumeration, array, complex number; type def names, type compatibility, type conversion, qualifier - const, volatile; operators in C++, operator precedence and operator overloading; C++ expressions, new and delete, Programming examples.

Unit -II

03. Function in C++:  07 Hours
Introduction. The main() function, function prototype, call by reference inline functions, default arguments, function overloading, friend functions, pointer to functions. Programming examples.

04. Class with Objects:  07 Hours
Introduction- declaration and definition of a class, definition member functions, C++ program with a class, making an outside function inline, nesting of member functions, arrays within class, static data members, static member functions, objects-global & local objects, scope & lifetime, pointers to objects, arrays of objects, function arguments with objects, returning objects: Programming examples.

Unit -III

05. Constructions and Destructors:  05 Hours

06. Operator Overloading and Type conversion:  08 Hours
Introduction, defining operator overloading, overloading unary operators, overloading binary operators, overloading binary operators using friends, rules for overloading operators, overloading the output operator <<, overloading the input operator>>, type conversation. Programming examples.

Unit IV

07. Inheritance, Virtual Functions and Polymorphism  08 Hours
Introduction, defining derived classes, classification of inheritance, making a private member inheritable, virtual base classes, abstract classes, constructors & destructors in base & derived classes. Virtual Functions and Polymorphism: Introduction, pointers to objects, this pointer, pointers to derived classes, type checking pointers to members, virtual functions, pure virtual functions.

08. Managing Console I/O and File I/O:  05 Hours
C++ stream classes, examples of formatted and unformatted I/O operations, classes for file stream operations, opening and closing a file, opening file using open(), file modes, Programming examples.

Text Books:

Reference Books:
2. Bhave, "Objected oriented programming with C++", Pearson Education.

Question paper pattern for SEE:
1. Total of eight questions with two from each unit to be set uniformly covering the entire syllabus.
2. Each question should not have more than 4 sub divisions.
3. Any five full questions are to be answered choosing at least one from each unit.
SIGNALS & SYSTEMS

Subject Code: UEE413C
Credits: 04

SEE Marks: 100
Exam Duration: 03 Hours

Prerequisite

Unit-I

01. Introduction: 13 Hours
Definitions of signals and systems, classification of signals, basic operations on signals, Elementary signals, systems viewed as interconnections of operations, properties of systems.

Unit-II

02. Time-domain representation for LTI systems: 13 Hours
Convolution, impulse response representation, properties impulse response representation, differential and difference equation representations, block diagram representations.

Unit-III

03. Fourier Analysis of periodic and aperiodic signals: 13 Hours
Fourier representation of continuous-time aperiodic signals (FT): Fourier transform (FT), Properties of Fourier transform.

Unit-IV

04. Z-Transforms: 13 Hours

Text Books:

Reference Books:

Question paper pattern for SEE:
1. Total of eight questions with two from each unit to be set uniformly covering the entire syllabus.
2. Each question should not have more than 4 sub divisions.
3. Any five full questions are to be answered choosing at least one from each unit.
OPERATIONAL AMPLIFIERS AND LINEAR IC'S

Subject Code: UEE414C
Credits: 04
SEE Marks: 100
Exam Duration: 03 Hours

Prerequisite

Unit-I
01. Op-Amps: 05 Hours
Block diagram and characteristics of 741 Op-amp, Op-amp as an inverting and non-inverting amplifier, voltage follower, adder, subtractor, integrator and differentiator.

02. Op-Amps as AC Amplifier: 08 Hours
Capacitor coupled voltage follower, high Zin capacitor coupled voltage follower, capacitor coupled non-inverting amplifier, high Zin capacitor coupled non-inverting amplifier, capacitor coupled inverting amplifier, setting the upper cut-off frequency, capacitor coupled difference amplifier and use of single polarity supply.

Unit-II
03. Op-Amps Frequency Response and Compensation: 08 Hours
Op-amp circuit stability, frequency and phase response, frequency compensating methods, manufacture's recommended compensation, op-amp circuit band width, slew rate effects, stray capacitance effects, load capacitance effects, Zin mod compensation and circuit stability precautions.

04. Signal Processing circuits: 05 Hours
Precision half wave & full wave rectifiers, limiting circuits, clamping circuits, peak detectors, sample and hold circuits.

Unit-III
05. Op-amp Nonlinear circuits: 06 Hours

06. Signal Generator: 07 Hours
Triangular/Rectangular wave generator, waveform generator design, phase shift oscillator, oscillator amplitude stabilization, Wein bridge oscillator, signal generators output controls.

Unit-IV
07. Active filters: 09 Hours
First and second order high pass and low pass filters, band stop and band pass filters.

08. D.C Voltage Regulators: 04 Hours
Voltage regulators basics, voltage follower regulator, adjustable output regulator, LM217 and LM237 integrated circuit voltage regulators.

Text Books:

Reference Books:

Question paper pattern for SEE:
1. Total of eight questions with two from each unit to be set uniformly covering the entire syllabus.
2. Each question should not have more than 4 sub divisions.
3. Any five full questions are to be answered choosing at least one from each unit.
Prerequisite

Unit-I

01. Single Phase Transformer: 07 Hours

02. Auto Transformer: 03 Hours
Construction, working principle, saving of copper, equivalent circuit and applications.

03. Three Winding Transformer: 02 Hours
Advantages and disadvantages of three winding transformers. Equivalent circuit.

Unit-II

04. Losses and Efficiency of Single Phase Transformer: 07 Hours
Types of losses, efficiency, all day efficiency, regulation. Testing of transformer: polarity test, predetermination of efficiency and regulation by OC and SC test and sumpner’s test. Parallel operation: need, conditions to be satisfied for parallel operation and load sharing.

05. Three Phase Transformer: 07 Hours
Types, three phase transformer connections: star-star, star-delta, delta-star, delta-delta, open delta. Choice of connections: bank of single phase transformers for three phase operations. Scott connection for three phase operations, scott connection for three phase to two phase conversation. Labeling of three phase transformer terminals, phase shift between primary and secondary and vector groups. Parallel operation of three phase transformers. Harmonics in transformer.

Unit-III

06. Three Phase Induction Machines: 14 Hours
Construction, types-squirrel cage, slip ring, double cage and deep bar motors. Principle of operation, production of rotating magnetic field, slip, rotor induced emf and it's frequency, power losses in an induction motor, equivalent circuit, torque equation, torque-slip characteristics-motoring generating and breaking mode, starting torque, maximum torque, effect of rotor resistances on torque slip -characteristics, power out put, no load and blocked rotor test- evaluation of equivalent circuit parameters, circle diagram and obtain it's performance, double cage and deep bar motors. Induction generator. Cogging and crawling.

Unit-IV

07. Starter and Speed Control of Three Phase Induction Motors: 06 Hours
Need for starter, DOL, star delta, autotransformer and rotor resistance starters. Speed Control: voltage, frequency and rotor resistance control.

08. Single Phase Induction Motors: 06 Hours
Construction, double field revolving theory and principle of operation, equivalent circuit types: split phase, capacitor start capacitor run motors and shaded pole motors.

Text Books:

References Books:

Question paper pattern for SEE:
1. Total of eight questions with two from each unit to be set uniformly covering the entire syllabus.
2. Each question should not have more than 4 sub divisions.
3. Any five full questions are to be answered choosing at least one from each unit.
MANAGEMENT & ENTREPRENEURSHIP

Subject Code: UHS416C
Credits: 03
SEE Marks: 100
Exam Duration: 03 Hours

Unit-I

01. Introduction: 03 Hours
Management: Science, Theory and Practice, Managing; Science and Art? The Functions of Managers, the Systems Model of Management, Management and Society, Social Responsibility and Ethics.

02. Planning : 04 Hours

03. Organizing: 04 Hours
The nature and Purpose of Organizing, Formal and Informal Organization, Organizational Division : The Department, Organization Level and the Span of Management, The Structure and Process of Organizing, Effective organizing, Basic Departmention, Matrix Organization Strategic Business Units, Line / Staff Authority and Decentralization of Authority and Power, Line and Staff concepts, Functional Authority, Decentralization of Authority, Delegation of Authority, Promoting and Appropriate Organization Culture, Case Studies.

Unit-II

04. Staffing : 04 Hours

05. Leading : 06 Hours

Unit – III

06. Communication :

07. Controlling: 05 Hours
The System and Process of Controlling, Control as a Feedback System, Feed forward control, Requirements for Effective Controls, Control Techniques and information Technology Control Techniques: The Budget, Traditional Non budgetary Control, Information Technology, Productivity and Operation, Direct control versus Preventive Control. Case studies.

08. Entrepreneurship : 03 Hours
Meaning of Entrepreneur, Evaluation of the Concept, Functions of an Entrepreneur, Intrapreneur - an Emerging Class, Concept of Entrepreneurship – steps in entrepreneurial process, Role of entrepreneurs in Economic Development; Entrepreneurship in India, Entrepreneurship – Barriers.

09. Micro Small & Medium Enterprises (MSME) : 03 Hours
Definition: Characteristics: Need and rational; Objectives; Scope; role of MSMe in Economic Development. Advantages of MSME, steps to strst an MSME – government policy towards MSMe; Impact of Liberalization, Privatization, Globalization MSME, Effect of WTO / GATT

10. Institutional Support : 02 Hours
Different Schemes: TECSOK, KIADB, KSSIDC, KSIMC, DIc Single window Agency; MSME, NISC; SIDBI, KSFC.

11. Preparation of Project: 02 Hours
Meaning of Project, Project Identification, Project Report Contents; Formulation; Project Appraisal Identification of Business Opportunities; Market Feasibility Studies; Technical Feasibility Studies; Financial Feasibility Studies and Social Feasibility Studies (in brief).

Text Books:


Question Paper Pattern SEE:

01. Total of Eight Questions with two from each unit to be set uniformly covering the entire syllabus.
02. Each Question should not have more than four sub divisions.
03. Any Five Full questions are to be answered choosing at least from each unit.
1. Design and testing of diode clipping and clamping circuits.
2. Design of fixed bias and voltage divider bias circuits for BJT.
3. Design of RC coupled single stage BJT amplifier and determination of the gain, frequency response, input and output impedances.
4. Calculation of hybrid parameters of a CE transistor amplifier
5. Design and testing of BJT oscillators.
   a. RC-Phase shift oscillator
   b. Colpitts oscillator
6. Study of Op-Amp as
   a. Inverting and non inverting amplifier
   b. Integrator and differentiator
   c. Voltage follower, adder & substractor
7. Study of Op-Amp as a zero crossing detector and Schmitt trigger.
   i. RC-phase shift oscillator
   ii. Wein bridge oscillator
10. Study of saturating and non saturating precision rectifiers using Op-Amp.

Laboratory Assessments for SEE:
1. Each Laboratory subject is evaluated for 100 marks (50 CIE and 50 SEE)
2. Allocation of 50 marks for CIE Performance and journal write-up: Marks for each experiment = 30 marks / No. of proposed experiments. One Practical test for 20 marks, (5 write up, 10 conduction, calculation, results etc., 5 viva-voce).
3. Allocation of 50 marks for SEE: 25% write up, 50% conduction, calculation, results etc., 25% viva-voce.
TRANSFORMER AND INDUCTION MACHINE LAB

Subject Code: UEE418L
Credits: 1.5
SEE Marks: 50
Exam Duration: 03 Hours

Prerequisite

1. Open circuit and short circuit test on single phase transformer and pre-determination of efficiency, regulation for different loads and power factors. Calculations of equivalent circuit parameters of a given transformer.
2. Sumpner's test.
3. Parallel operation of two single phase transformers (dis-similar ratings)
4. Connections of three single phase transformers: star-star, star-delta, delta-delta and delta-star.
5. Scott Connection.
7. No-load and blocked rotor test on three phase induction motor to calculate parameters of equivalent circuit diagram and performance evaluation.
8. No-load and blocked rotor test on three phase induction motor to draw the circle diagram and hence the performance evaluation of given motor.
9. Speed control of three phase slip ring induction motor by rotor resistance.
10. Load test on single phase induction motor and performance evaluation (torque-speed, BHP- efficiency, slip -BHP, etc)

Laboratory Assessments for SEE:
1. Each Laboratory subject is evaluated for 100 marks (50 CIE and 50 SEE)
2. Allocation of 50 marks for CIE Performance and journal write-up: Marks for each experiment = 30 marks / No. of proposed experiments. One Practical test for 20 marks, (5 write up, 10 conduction, calculation, results etc., 5 viva-voce).
3. Allocation of 50 marks for SEE: 25% write up, 50% conduction, calculation, results etc., 25% viva-voce.
ADVANCED MATHEMATICS – I

Subject Code: UMA001M  
Mandatory Subject
Sem: IV  
Branch: Common to all

Prerequisite

01. Differential Calculus:  
18 Hours

02. Integral Calculus:  
11 Hours
Reduction formula for functions $\sin^n x, \cos^n x, \tan^n x, \sin^n x \cos^n x$. and evaluation of these integrals with standard limits-problems. Double and Triple integrals simple problems (with standard limits). Beta and Gamma functions, properties, relation between Beta and Gamma functions simple problems.

03. Higher Order Differential Equations:  
11 Hours
Differential equations of second and higher orders with constant coefficients. Method of undetermined coefficients, Variation of parameters and Cauchy’s homogeneous linear equations.

Resources:


Question Paper Pattern for SEE:

1. Total of eight questions to be set, covering the entire syllabus.
2. Each question should not have more than 4 sub divisions.
3. Any five full questions are to be answered.
CONSTITUTION OF INDIA  
(MANDATORY SUBJECT)

Subject Code: UHS226M  
Credits:  
Exam Duration:  
SEE Marks:

Prerequisite

Unit-I
Salient features of Indian Constitution and Preamble of the Indian Constitution. Fundamental rights meaning - their significance and their enforcement.  
06 Hours

Unit –II
Directive principles of state polices – Relevance of DPs in governance fundamental duties.- their significance  
Union Government – Union Executive - President - Vice – President – Prime Minister - Council of Ministers – their qualifications – election appointment – term and functions.  
07 Hours

Unit – III
07 Hours

Unit – IV
06 Hours

Texts Books:
01. Sukla . V. N. : - Introduction of the constitution of India (Latest Edn)

Question Paper Pattern for SEE:

Question paper is of objective type covering all the four units.
Students have to pass this subject compulsory for the award of degree. However, marks will not be considered for awarding Grades / Class / Ranks.