FACULTY OF ENGINEERING, LIFE SCIENCES & MANAGEMENT

IASE Deemed University

Gandhi Vidya Mandir, Sardarshahr
(Rajasthan) – 331403,
INDIA

Teaching and Examination Scheme and Syllabus

for

Diploma in Electronics & Communication Engineering
(Three-Year Full Time Diploma in Engineering Programme)
(SEMESTER SCHEME)

III and VI Semester

Sessions 2016-17,2017-18

IASE D University, Sardarshahr Scheme and Syllabus of Diploma in Engineering effective from Session 2015-16

Rules And Guidelines For The Students

1. The Diploma in engineering (Electronics & Communication Engineering) course is a three year (Six Semesters) full time integrated Diploma programme.

2. ELIGIBILITY for Admission

A candidate seeking admission to the first year of the Diploma in engineering course shall be required to have passed secondary examination from any board recognized by Rajasthan Board of Secondary Education, Rajasthan with at least 45% marks in aggregate for general category candidates, and 40% for SC/ST/OBC candidates.

3. ADMISSION procedure

Admission to the first year Diploma in engineering course shall be made on the basis of marks scored by the candidates in his/her secondary examination.

4. THE PROGRAMME

The Diploma in engineering(Mechanical Engineering) course is a three year (Six Semester) full time degree program .The course structure and program administration are as follows.

5. COURSE STRUCTURE

The three years, six semester teaching consists of Theory (Lectures and Tutorials) and Practicals/Sessionals (Laboratory work, Engineering Graphics, Workshop Practice and Project etc.).Examination will be held at the end of the each semester. Details of these are given in the Teaching & Examination Scheme.

6. PROGRAMME ADMINISTRATION

6.1 Medium of Instruction

English/Hindi shall be the medium of instruction and examination.

6.2 EVALUATION

(a) Each subject will be evaluated through a theory paper at the end of the semester carrying 80 marks along with continuous evaluation of sessional work, carrying 20 marks. The theory paper shall be of three hour duration. The sessional work will consist of continuous assessment of student's performance by teachers in tutorial classes, and class tests.

(b) Three class tests will be organized in each semester as per the scheme. The higher two out of the marks scored in the three tests will be considered for the sessional marks.

IASE D University, Sardarshahr Scheme and Syllabus of Diploma in Engineering effective from Session 2015-16

(c) Evaluation of laboratory practical work and Engineering Graphics (Drawing) will be through continuous assessment throughout the semester as well as examination at the end of the semester.

(d) Project: The project work will be carried out in the V & VI semester. The topic of the project will be approved by the Head of the Department and the entire project work will be carried out under the guidance of a teacher of the department approved as project supervisor by the Head of the Department. The nature of the project work will consist of varying proportions of designing, fabrication, testing and analysis of results. The project topic can also be taken from a live industrial problem. The report of the completed project shall be signed by the guide and submitted to the Head of the Department on or before the last working day of the sixth semester. The evaluation of the project will be done by a board consisting of two examiners.

7. Promotion

7.1 The maximum span period of a program is six years from the date of registration in the program.

7.2 The minimum marks for passing the examination for each semester shall be 50% in each practical/ sessional, 40% in End Semester Examination of each theory paper, 50% in training and project, and 45% in the aggregate of all the subjects (theory, sessional and project) of the semester.

7.3 A student will be permitted to attend the classes of the second/fourth/sixth semesters immediately after the examination of the first/third/fifth semester's examination, as the case may be, provided he/she has appeared in the first/third/fifth semester examination, respectively.

7.4 To be eligible for promotion to the 3rd semester of the program a student must have successfully cleared at least 11 subjects out of the 22 subjects including practicals of the first and second semesters taken together.

7.5 To be eligible for promotion to the 5th semester of the program a student must have successfully cleared at least half of the total subjects including practicals and sessionals of the third and fourth semesters taken together.

7.6 A student promoted to the third/fifth semesters, without having cleared all the papers, will have to appear and pass the backlog papers of the first/third semesters along with the regular examination of the first/third semesters and backlog papers of the

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second/fourth semesters along with the regular examination of the second/fourth semesters.

7.7 A candidate who has secured minimum marks to pass in each paper but has not secured the minimum marks required to pass in the aggregate for the semester concerned may take re-examination in not more than two papers to obtain the aggregate percentage required to pass the semester. The candidate will have to pay the requisite examination fee in order to be eligible for re- examination. In this case the marks secured by the candidate in the earlier examination in the paper concerned will be cancelled.

7.9 (a) Award of Division:

Securing 60% marks and above – Ist division Securing
50% and above but below 60% - IInd division
Securing 45% and above but below 50% - pass

(b) A student who has secured 75% marks and above shall be declared to have passed in first division with honours. However, for this the student must have cleared successfully all the subjects in single attempt in the final year period of his/her study.

(C) Similarly, to be eligible for a gold medal on account of having secured first position, the student must have cleared all subjects in single attempt and passed them with first division.

7.10 For determining merit position of the candidates at the final year level the marks obtained by them in the first, second and final year as described above shall only be considered.

7.11 If a student (who has successfully completed the programme) wishes to reappear in one or more theory papers of the first, second, third, fourth, fifth, sixth semesters for the purpose of improving his/her marks, he/she will be permitted to do so on payment of requisite examination fee along with the regular examinations of that semester; however, the total number of such attempts shall not exceed four theory papers during the span period of the programme. For this his/her previous performance in the paper/papers concerned shall be treated as cancelled. The application for such reappearing/re-examination must be submitted before the next examination of the corresponding semester. However, such candidates shall not be considered for award of gold medal.

IASE D University, Sardarshahr Scheme and Syllabus of Diploma in Engineering effective from Session 2015-16

7.12 A student to be eligible for award of degree has to clear all papers offered during four-year programme within the span period of eight years.

8. LATERAL ENTRY

Students who have passed 10+2 or ITI examination from the Board of Technical Education, Rajasthan, or its equivalent with a minimum of 60% marks can be admitted to the Third Semester of the Diploma programme.

9. Attendance: All students are required to have 75% attendance in each subject and there must be 75% attendance of the student before he/she could be permitted to appear in the examination.

10. **RULES FOR CHANGE OF BRANCH FOR THE STUDENTS OF III SEM. DIPLOMA.:**

The faculty, on the basis of applications received from desirous students up to the date and time notified by the Director, will prepare a merit list of the students. The list will be prepared on the basis of overall merit of the I (Semester) result only and the applications for change of branch will be processed as per the merit list.

ELIGIBILITY CRITERIA:

(a) The students must have passed the I Semester Diploma Examination in all components in one attempt with at least 60% marks in aggregate. The student with back papers or whose result has not been declared will not be considered for change of branch.

(b) In case any student has applied for re-valuation/ re-totaling of his/her marks of I Semester Diploma and the result has not been received till the time of change of branch, such a student will not be entitled for change of branch on the basis of his/her subsequently revised result.

PROCEDURE:

1) Applications in a specified format (developed by the faculty) for change of branch will be invited by the Director/Principal of the faculty on the basis of the result of I (Semester) Diploma in duplicate, upto the date notified by IASE University. One copy of each such application be sent to IASE University by that date.

2) The students would submit a photo copy of I (Semester) Examination mark sheet of that year along with the application. The student may give as many preferences as possible against the vacant seats in respective college.

3) A seat matrix shall be prepared by the faculty, as per the details of the vacant seats

IASE D University, Sardarshahr Scheme and Syllabus of Diploma in Engineering effective from Session 2015-16

(admitted through direct admission) in the previous year.

4) Due to change of branch, the strength of student in any branch should not fall short of 75% of the enrolled students in that branch in that year. And under no circumstances, due to change of branch, the number of seats in a particular branch in a college shall exceed the sanctioned strength approved by the AICTE, for that batch.

5) All students who have applied for the change of branch in-time will be called for counseling by the admission council of the faculty and considered for change of branch as per merit, preference and availability of seat. However, at the time of the counseling, if any student wishes to withdraw his/her application he/she can do so by a written request. In case any student does not present himself/herself for counseling, his/her branch will be changed as per the preference mentioned in the application form, merit and availability of seat.

11. RULES FOR THE AWARD OF GRACE MARKS

A. **UNDER GRADUATE/ POST GRADUATE (MAIN/SUPPLYMENTARY EXAMINATIONS UNDER THE FACULTIES OF ENGINEERING & TECHNOLOGY.**

Grace marks to the extent of 1% of the aggregate marks prescribed for an examination will be awarded to a candidate failing in not more than 25% of the total number of theory papers, practicals, sessionals, dissertation, viva-voce and the aggregate, as the case may be in which minimum pass marks have been prescribed; provided the candidate passes the examination by the award of such Grace marks. For the purpose of determining the number of 25% of the papers, only such theory papers practicals, dissertation, viva-voce etc. would be considered, of which, the examination is conducted by the University.

N.B.:- If 1% of the aggregate marks or 25% of the papers works out in fraction, the same will be raised to the next whole number. For example, if the aggregate marks prescribed for the examination are 450, grace marks to the extent of 5 will be awarded to the candidate, similarly, if 25% of the total papers is 3.2, the same will be raised to 4 papers which grace marks can be given.

GENERAL:-

- A candidate passes in a paper/ practical or the aggregate by the award of grace marks will be deemed to have obtained the necessary minimum for a pass in that paper/ practical or in the aggregate and shown in the marks sheet to have passed by grace. Grace marks will not be added to the marks obtained by a candidate from the examiners nor will the marks obtained by the candidate be subject to any deduction due to award of grace marks in any other paper/ practical or aggregate.
- If a candidate passes the examination but misses First or Second Division by one mark, his aggregate will be raised by one mark so as to entitle him for the first or second division, as the case may be. This one mark will be added to the paper in which he gets the least marks and also in the aggregate by showing +1 in the tabulation register below the marks actually obtained by the candidate. The marks entered in the marks-sheet will be inclusive of one grace mark and it will not be shown separately.

- Non appearance of a candidate in any paper will make him ineligible for grace marks. The place of a passed candidate in the examination list will, however be determined by the aggregate marks he secures from the examiners, and he will not, by the award of grace marks, become entitled to a higher division.
- Distinction won in any subject at the examination is not to be forfeited on the score that a candidate has secured grace to pass the examination.

Note: - The Grace marks will be awarded only, if candidate appears in all the papers prescribed for the examination.

TEACHING & EXAMINATION SCHEME

For Diploma in Engineering – Three Year (6 Semester) Full Time Diploma Programme

Diploma in Electronics & Communication Engineering –
Second Year **Semester – III**

Subject Code	Title	Hrs. / Week			Credit	IA		Exam		Total
		L	T	P		Th	P	Th	P	
DECE-301	Applied mathematics-IIIS	3	1		4	20		80		100
DECE-302/DECE-302-P	Circuit Theory	3			4	20	45	80	30	175
DECE-303/DECE-303-P	Electronic & Photonic Material	3	-	2	4	20	40	80	60	200
DECE-304/DECE-304-P	Electronics Devices & Circuits	3		3	4.5	20	40	80	60	200
DECE-305/DECE-305-P	Computer Practice	3	-	3	4.5	20	45	80	30	175
DECE-306	Management	3	1	-	4	20	-	80	-	100
DECE-307	Discipline & Extra Curricular Activity	1								50
	Total	**18**	**2**	**12**	**26**					**1000**

Diploma in Electronics & Communication Engineering –
Second Year **Semester – IV**

Subject Code	Title	Hrs. / Week			Credit	IA		Exam		Total
		L	T	P		Th	P	Th	P	
DECE-401/DECE-401-P	Electronic Circuits	3		2	4	20	40	80	60	200
DECE-402/DECE-402-P	Digital System	3	-	2	4	20	20	80	30	150
DECE-403	Electromagnetic theory and Waveguide	3	1	-	4	20	-	80	-	100
DECE-404/DECE-404-P	Electronic Measurements & Instrumentation	3	-	3	4.5	20	20	80	30	150
DECE-405/DECE-405-P	Communication Theory	3	-	3	4.5	20	40	80	60	200
DECE-406/DECE-406-P	Energy Audit & Management	3		2	4	20	20	80	30	150
DECE-407	Discipline & Extra Curricular Activity	1								50
	Total	**18**	**2**	**12**	**26**					**1000**

IA- Internal Assessment **T- Tutorial**
L- Lecture **P- Practical**

Th- Theory
1

Diploma in Electronics & Communication Engineering –
Third Year **Semester – V**

Subject Code	Title	Hrs. / Week			Credit	IA		Exam		Total
		L	T	P		Th	P	Th	P	
DECE-501/DECE-501-P	Microprocessors and Interfacing	3	-	2	4	20	30	80	20	150
DECE-502/DECE-502-P	Communication Theory-II	3	-	2	4	20	45	80	30	175
DECE-503/DECE-503-P	Industrial Electronics	3	-	2	4	20	30	80	20	150
DECE-504/DECE-504-P	Microwave Engineering	3	-	2	4	20	45	80	30	175
DECE-505	Television Engineering	3	1		4	20		80		100
DECE-506	Computer Architecture and Organization	3	1	-	4	20	-	80	-	100
DECE-507	Practical Training (24 Working days)			2	1					100
DECE-508	Discipline & Extra Curricular Activity				1					50
	Total	**18**	**2**	**12**	**26**					**1000**

Diploma in Electronics & Communication Engineering
Third Year **Semester – VI**

Subject Code	Title	Hrs. / Week			Credit	IA		Exam		Total
		L	T	P		Th	P	Th	P	
DECE-601/DECE-601-P	Fibre Optic Communication	3	-	2	4	20	40	80	60	200
DECE-602	Control System	3	1		4	20		80		100
DECE-603	Computer Network	3	-	2	4	20	40	80	60	200
DECE-604/DECE-604-P	Object Oriented Programming	3	-	2	4	20	40	80	60	200
DECE-605-P	Project	-	-	2	1		50		200	250
DECE-606	Discipline & Extra Curricular Activity				1					50
	Total	**12**	**1**	**08**	**18**					**1000**

IA- Internal Assessment **T- Tutorial**
L- Lecture **P- Practical**
Th- Theory

Diploma Second Year Syllabus

Semester III

DECE-301-APPLIED MATHEMATICS-III

UNIT – I

Fourier Series : Euler's Formulae, Conditions for Fourier expansions, Fourier expansion of functions having points of discontinuity, change of interval, Odd & even functions, Half-range series.

UNIT- II

Fourier Transforms : Fourier integrals, Fourier transforms, Fourier cosine and sine transforms. Properties of Fourier transforms, Convolution theorem, Perseval's identity, Relation between Fourier and Laplace transforms, Fourier transforms of the derivatives of a function, Application to boundary value problems.

UNIT-III

Functions of a Complex Variables : Functions of a complex variable, Exponential function, Trigonometric, Hyperbolic and Logarithmic functions, limit and continuity of a function, Differentiability and analyticity. Cauchy-Riemann equations, Necessary and sufficient conditions for a function to be analytic, Polar form of the Cauchy-Riemann equations, Harmonic functions, Application to flow problems, Conformal transformation, Standard transformations (Translation, Magnification & rotation, inversion & reflection, Bilinear).

UNIT-IV

Probability Distributions : Probability, Baye's theorem, Discrete & Continuous probability distributions, Moment generating function, Probability generating function, Properties and applications of Binomial, Poisson and normal distributions.

UNIT-V

Linear Programming : Linear programming problems formulation, Solution of Linear Programming Problem using Graphical method, Simplex Method, Dual-Simplex Method.

Reference Book :

1. Complex variables and Applications : R.V. Churchil; Mc. Graw Hill

2. Engg. Mathematics Vol. II: S.S. Sastry; Prentice Hall of India.

3. Operation Research : H.A. Taha

4. Probability and statistics for Engineer : Johnson. PHI.

DECE-302- CIRCUIT THEORY

UNIT -I ANALYSIS OF DC CIRCUITS

Introduction to DC circuits;, Mesh analysis; Presence of dependent sources; circuits with current sources; Node analysis; presence of dependent sources, circuits with voltage sources; network reduction; source transformation; star-delta transformation.

UNIT- II

ANALYSIS OF AC CIRCUITS

Introduction to AC circuit; phasors; Impedance and admittance; steady state analysis of RL, RC and RLC circuits; power and power factor; Series and Parallel resonance; Mesh impedance matrix and node admittance matrix; solving AC circuits using mesh and node analysis.

UNIT- III

NETWORK THEOREMS

Super position theorem, Thevenin's theorem, Norton's theorem, Maximum power transfer theorem, Millman's theorem, Reciprocity theorem; Application of network theorems in solving DC and AC circuits.

UNIT -IV

TRANSIENT ANALYSIS

Introduction; Exponentially increasing and decreasing functions; time constant; RC and RL source free and driven circuits; transients in RC, RL and RLC circuit with DC excitation. Laplace transforms; Transform impedance; Circuit transients using Laplace transform.

UNIT- V

THREE PHASE CIRCUITS, TUNED CIRCUITS AND GRAPH THEORY

Analysis of balanced and simple unbalanced three phase circuits; Two-wattmeter method of measuring three-phase power; Analysis of coupled and tuned circuits; Graph of a network; Trees, chords and branches; Tie-set and cut-set of a graph.

REFERENCES BOOK

1. Charles K. Alexander and Matthew N. Q. Sadiku, "Fundamentals of Electric Circuits" Third Edition, Mc Graw-Hill International Edition, 2007.

2. Richard C. Dorf and James A. Svoboda, "Introduction to Electric Circuits", 7th Edition, John Wiley & Sons, Inc. 2006.

3. William H Hayt, J E Kemmerly and Steven M Durbin, " Engineering Circuit Analysis", Seventh Edition, Mc Graw Hill, 2007.

4. Sudhakar, A. and Shyam Mohan S.P, Circuits and Networks Analysis and Synthesis, Fourth edition, Tata McGraw Hill Publishing Compamy Ltd., New Delhi, 2010

5. Edminister J.A., Theory and Problems of Electric Circuits, Schaum's Outline Series, McGraw Hill Book Company, 5th Edition, 1995.

DECE-302-P- CIRCUIT THEORY

1. Verification of KVL & KCL
2. Verification of Thevenin's Theorem
3. Verification of Norton's Theorem
4. Verification of Superposition Theorem
5. Verification of Reciprocity Theorem
6. Verification of Compensation Theorem
7. Verification of Maximum Power Transfer Theorem
8. Verification of kirchoff's law
9. Parallel & Series Resonance circuit

DECE-303- ELECTRONIC AND PHOTONIC MATERIALS

UNIT- I

Electronic materials: Importance of Classical and Quantum free electron theory of metals – Fermi energy and Fermi Dirac distribution function – Variation of Fermi level with temperature in intrinsic and extrinsic semiconductors – Hall effect – Dilute Magnetic Semiconductors (DMS) and their applications – High 18 EC – 07-08 – SRM – E&T temperature Superconductivity.

Photonic materials: LED and LCD materials – Photo conducting materials – Nonlinear optical materials (elementary ideas) and their applications.

UNIT- II

MAGNETIC, DIELECTRIC AND MODERN ENGINEERING MATERIALS

Magnetic materials: Ferrites and garnets – Magnetic bubbles and their applications – Giant Magneto Resistance (GMR) – Colossal Magneto Resistance (CMR).

Dielectric materials: Various polarization mechanisms in dielectrics (elementary ideas) and their frequency and temperature dependence – Dielectric loss – Piezo electric and ferro electric materials and their applications. Modern engineering materials: Shape memory alloys – Metallic glasses – Advanced ceramics and composites.

UNIT- III

BIO MATERIALS

Classification of biomaterials – Comparison of properties of some common biomaterials – Effects of physiological fluid on the properties of biomaterials – Biological responses (extra and intra vascular system) – Metallic, Ceramic and Polymeric implant materials – Introduction to bio sensors and tissue engineering.

UNIT- IV

NANO MATERIALS AND NANOTECHNOLOGY

Basic concepts of Nano science and technology – Quantum wire – Quantum well – Quantum dot – Properties and technological advantages of Nano materials – Carbon Nanotubes and applications – Material processing by Sol – Gel method, Chemical Vapour deposition and Physical Vapour deposition – Microwave Synthesis of materials – Principles of SEM, TEM and AFM .

UNIT -V

MECHANICAL PROPERTIES OF MATERIALS

Stress Strain diagram for different engineering materials – Engineering and true stress strain diagram – Ductile and brittle material – Tensile strength – Hardness – Impact strength –

Fatigue – Creep – Fracture (Types and Ductile to brittle transition) – Factors affecting mechanical properties.

REFERENCE BOOKS

1. Rolf E. Hummel, "Electronic Properties of materials", Narosa Publishing House, New Delhi, 1994.

2. Raghavan.V., "Materials Science & Engineering – A First Course", 5th edition, Prentice Hall of India, New Delhi,2005.

3. Khanna. O. P., "A Text Book of Material Science & Metallurgy", Revised edition, Dhanpat Rai Publications, New Delhi,2006.

4. Sujata V. Bhat, "Biomaterials", 2nd edition, Narosa Publishing House, New Delhi, 2006.

5. Mick Wilson, Kamali Kannangara, Michells Simmons and Burkhard Raguse, "Nano Technology – Basic Science and Emerging Technologies", 1st edition, Overseas Press,New Delhi,2005.

DECE-303-P- ELECTRONIC AND PHOTONIC MATERIALS

1. Band gap determination using Post office box.
2. Dielectric constant measurement.
3. Photoconductivity measurement.
4. Resistivity determination for a semiconductor wafer using Four probe method.
5. Determination of Hall coefficient and carrier type for a semiconductor material.
6. To trace the hysteresis loop for a magnetic material.
7. Magnetic susceptibility – Quincke's method.
8. Determination of thermal conductivity – Lee's Disc method
9. Visit to Nano Technology Laboratory (optional)

DECE-304-ELECTRON DEVICES & CIRCUITS

UNIT -I

ENERGY BANDS AND EXCESS CARRIERS IN SEMICONDUCTORS

Energy bands and excess carriers in semiconductors: Bonding forces and Energy Bands in Solids – Charge Carriers in Semiconductors – Carrier concentrations – Drift of Carriers in Electric and Magnetic Fields – Invariance of the Fermi level at Equilibrium.

Excess carriers in semiconductors: Optical Absorption – Luminescence – Carrier Lifetime and Photoconductivity – Diffusion of Carriers.

UNIT- II

SEMICONDUCTOR JUNCTIONS

Junctions : Equilibrium Conditions – Forward and Reverse Biased Junctions – Reverse Bias Breakdown – Transient and AC Conditions – Deviations from the Simple Theory – Metal-Semiconductor Junctions.

Field Effect transistors: Transistor Operation – The junction FET – The Metal-Semiconductor FET – The Metal-Insulator-Semiconductor FET – The MOS FET.

UNIT- III

SOLID STATE DEVICES-I

Bipolar Junction Transistors: Fundamentals of BJT Operation – Amplification with BJT's – Minority Carrier Distributions and Terminal Currents – Generalized Biasing – Switching – Other Important Effects – Frequency Limitations of Transistors – Hetero junction Bipolar Transistors

Opto-electronic devices:

Photodiodes – Light Emitting Diodes – Lasers and Semiconductor Lasers

UNIT- IV

SOLID STATE DEVICES-II

Charge transfer devices: Dynamic Effects in MOS Capacitors – The basic CCD – Improvements on the Basic Structure – Applications of CCD's.

High-frequency and high-power devices: Tunnel Diodes – IMPATT Diode – Gunn Diode – PNPN Diode – SCR – IGBT – DIAC – TRIAC – UJT.

UNIT- V

POWER SUPPLIES Half wave Rectification – Full wave Rectification – General filter consideration – Capacitor Filter – RC Filter – Discrete Transistor Voltage Regulation – IC Voltage Regulators – Practical Applications – SMPS.

REFERENCE BOOKS

1. Donald A. Neamen, "Semiconductor Physics and Devices, 2nd Edition, Irwin publishers.
2. S.M. Sze , "Physics of Semiconductor Devices", 2nd edition, Wiley Eastern
3. Stanley G. Burns and Paul R. Bond ," Principles of Electronic Circuits", Galgotia Publishers

DECE-304-P-ELECTRON DEVICES & CIRCUITS

1. Characteristics of PN junction and Zener diode.
2. Input, Output and Transfer characteristics of CE and CC Amplifier.
3. Characteristics of LDR, Photo-diode and Photo transistor.
4. Transfer characteristics of JFET.
5. Transfer characteristics of MOSFET (with depletion and enchancement mode)
6. Characteristics of LED with three different wavelengths.
7. Half wave rectifier.
8. Full wave rectifier with 2 diodes.
9. Full wave rectifier with 4 diodes (Bridge rectifier).
10. Series voltage Regulator.
11. Shunt voltage Regulator.

DECE-305- COMPUTER PRACTICE

UNIT- I

PROGRAMMING FUNDAMENTALS

Computer Basics; Program Development Life Cycle: Flow Chart, Algorithm, Compilation and Execution; Introduction to C Language: program structure, variables, keywords, data types; Input / Output functions: scanf, printf; simple programs.

UNIT- II

DECISION AND LOOP CONTROL STRUCTURE

Logical operators; Decision statements: if/else, switch/case statements; Loop control statements – for, while, do/while.

UNIT- III

ARRAYS AND FUNCTIONS

Arrays: Introduction to arrays; one dimensional arrays: declaration, reading and printing array elements, sorting and searching.

Functions: Definition; declaration of functions; return statement; recursion

UNIT- IV

INTRODUCTION TO OOP CONCEPTS OOP concepts: data hiding, encapsulation, inheritance, overloading, polymorphism; classes and objects; constructor and destructor; simple program in C++.

UNIT-V

INHERITANCE AND OVERLOADING Inheritance – single, multiple, multilevel; Overloading – Function overloading, Operator overloading.

DECE-305-P- COMPUTER PRACTICE

1. Programs to demonstrate the use of scanf ( ) and printf( ) functions
2. Programs to evaluate arithmetic expressions
3. Programs using conditional statements
4. Programs using for, while , do…while
5. Programs on arrays
6. Programs to perform matrix addition and multiplication
7. Programs to implement functions
8. Programs to illustrate recursion
9. Program to create classes and objects using C++
10. Program to implement Constructor and Destructor in C++
11. Program to implement single inheritance in C++
12. Program to implement Function overloading in C++
13. Program to implement Operator overloading in C++

DECE-306 MANAGEMENT- I

Unit -I Entrepreneurship: Role of entrepreneurship and its advantage, Classification of industries (based on scale), Classification of industries (based on type), New industrial policy, M.R.T.P. act, Product identification/ selection, Site selection, Plant layout, Institutional support needed, Pre-market survey

Unit- II Entrepreneurship Support System: Role of District Industries Centre in setting up industry, Function of NSIC, SISI, NISIET, NRDC, SSIC, SIDO, NMTC, KVIC, RSMDC, Role of state finance corporation, state electricity board, pollution control board, RAJCON, BIS, I.S.O. etc.

Unit- III Principles of Management: Management, administration and organisation, difference between them, Scientific management: Meaning, characteristics, object and advantage: Taylor's scientific management – Fayol's principles of management, functions of management, Types of **Raw Material Management:** Allotment of iron and steel, coke/ coal, Allotment of other indigenous raw material from NSIC, Allotment of imported raw material and parts

Unit -IV

Marketing Facilities: Supply of product to state govt, to defence, to railways, to CSPO, to CSD, Participation in international exhibition and fairs, trade centres, state emporium and departmental stores, Quality consciousness and its effect on product sales Marketing **Management:** Concept of Marketing, Problems of Marketing, Pricing policy, Distribution channels and methods of marketing

Unit -V

Setting up SSI: Registration of SSI, Allotment of land by RIICO, Preparation of project report, Structure of organization, Building construction, Establishment of machines

Financial Sources for SSI: Various institutions providing loans for industries, various types of loans, Subsidies

Reference Books:

1. Hand Book of Small Scale Industry P.M. Bhandari
2. Hand Book on Entrepreneurship Development O.P. Harkut
3. Entrepreneurial Development S.S. Khanka
4. Statistical Quality Control Mahohar Mahajan
5. ISO: 9000 Quality System S. Dalela
6. Industrial Management V.K. Sharma & O.P. Harkut
7. Industrial Engg. & Management O.P. Khanana
8. Industrial Engg. & Management T.R. Banga

Diploma Second Year Syllabus

Semester IV

DECE-401- ELECTRONIC CIRCUITS

UNIT -I

BIASING METHODS AND SMALL SIGNAL MODELS (BJT, JFET, MOSFET)

DC & AC Load Lines-Operating Point-Q- Point variation-various Biasing Methods- Small signal equivalent - Calculation of voltage gain, current gain, power gain, input impedance and output impedance.

UNIT- II

TRANSISTOR AMPLIFIER AND ANALYSIS

Small Signal analysis of BJT, JFET and MOSFET amplifiers - Cascade amplifier- Cascade amplifier Darlington Bootstrap amplifier- Differential amplifier.

UNIT- III

FEEDBACK AMPLIFIERS AND OSCILLATORS

Concept of feedback- Types of feedback- Analysis of voltage & current feedback amplifiers Barkhausen criterion for oscillation – mechanism for start of oscillation & stabilization of amplitude – Analysis of RC & LC oscillators.

UNIT- IV

LARGE SIGNAL AND TUNED AMPLIFIERS

Class-A CE amplifier – Q point placement – Power calculation – Maximum dissipation Hyperbola – Transformer coupled Amplifier – Class-B push pull amplifier – Class-AB operation- – Direct coupled push pull amplifier – Amplifier using complementary symmetry- Heat sink. Single Tuned Amplifiers – Double tuned & synchronously tuned amplifiers.

UNIT -V

FREQUENCY RESPONSE AND WAVE SHAPING CIIRCUITS

Low frequency and High frequency response of BJT and FET amplifier. Nonlinear wave shaping circuits: Astable, Bistable , Monostable Multivibrators. Schmitt Trigger - Time Base Generators.

REFERENCES BOOKS:

1.David A Bell, “Electronic Devices and Circuits”, Prentice Hall of India, 1998.

2.Jacob Millman, Christos C Halkias, “Electron Devices and Circuits”, Tata McGraw Hill, Edition 1991 3.Donald L Schilling, Charles Belove, “Electronic Circuits”, 3rd edition, 1989.

4.Stanley G. Burns , Paul R,Bond, " Principles of Electronic Circuits " ,Galgottia publishers.

DECE-401-P- ELECTRONIC CIRCUITS

1. Frequency response of RC coupled amplifier using BJT or FET.
2. Colpitts Oscillator.
3. Efficiency of Class-A or Class AB Amplifier.
4. Frequency response of Single Tuned Amplifier.
5. Frequency response of a BJT amplifier with and without feedback.
6. Astable Multivibrator
7. Monostable Multivibrator
8. Bistable Multivibrator
9. Differential and Summing Amplifier.
10. Integrator and Differentiator.
11. Wein Bridge and RC Phase Shift oscillator.
12. Active filters: Band pass filter and Notch filter.

DECE-402- DIGITAL SYSTEMS

UNIT- I

NUMBER SYSTEMS - BOOLEAN ALGEBRA AND LOGIC GATES

Number Systems - Boolean algebra – Canonical and standard forms. Digital logic gates – Integrated circuits. Map method – four and five variable map methods –Products of Sums Simplification - Don't care conditions .Quine -McClucskey Method.

UNIT- II

GATE LEVEL MINIMIZATION & COMBINATIONAL LOGIC

Two level implementation – NAND & NOR Implementations – EXOR Functions. Combinational Circuits – Analysis and design procedure – Binary adder - Subtractor – Decimal Adder – Binary Multiplier – Magnitude Comparator – Decoders – Encoders – Multiplexers.

UNIT -III

SYNCHRONOUS SEQUENTIAL LOGIC

Sequential circuits - Latches – Flip-Flops - Analysis of Clocked Sequential Circuits – State Reduction and Assignment – Design Procedure. Registers – Shift Registers – Ripple counters – Synchronous Counters – Other counters.

UNIT -IV

AYSYNCHRONUS SEQUENTIAL LOGIC AND MEMORY

Introduction – Analysis Procedure – Circuit with Latches – Design Procedure – Reduction of State and Flow Tables – Race-Free state Assignment. Memory – Introduction – Random-Access Memory – Memory Decoding – Read only memory.

UNIT -V

DIGITAL INTEGRATED CIRCUITS AND PROGRAMMABLE LOGIC

Introduction – Special Characteristics – Bipolar-Transistor Characteristics – RTL and DTL Circuits – TTL – ECL - MOS – CMOS – CMOS Transmission Gate Circuits – Programmable Logic Array – Programmable Array Logic - Sequential Programmable Devices.

REFERENCE BOOKS

1. Floyd, "Digital Fundamentals" , Universal Book Stall, New Delhi,1986.

2. Morris Mano. M, "Digital Design ", PHI, Second Edition.

3. Ronald J. Tocci, "Digital System Principles and Applications", Pearson education 9th edition.

DECE-402-P- DIGITAL SYSTEMS

1. Study of Gates & Flip-flops.
2. Half Adder and Full Adder.
3. Magnitude Comparator (2-Bit).
4. Encoders and Decoders.
5. Multiplexer and Demultiplexer.
6. Code Converter.
7. Synchronous Counters.
8. Ripple Counter.
9. Mod – N Counter.
10. Shift Register – SISO & SIPO

DECE-403- ELECTROMAGNETIC THEORY AND WAVEGUIDES

UNIT -I

STATIC ELECTRIC FIELDS

Introduction to co-ordinate system-**Coulomb's law:** Electric field intensity-Field due to different types of charges-Electric Flux density. **Gauss law:** It's applications to symmetrical charge distributions- Concept of divergence. **Electric potential:** Potential field due to different types of charges-Potential gradient-The dipole field due to dipole-Energy density in electrostatic field.

UNIT -II

STEADY MAGNETIC FIELDS

Biot Savart Law: Its applications. **Ampere's circuital law:** Its applications-Curl of magnetic field intensity Magnetic flux and magnetic flux density-The scalar and vector magnetic potentials-Steady magnetic field laws.

UNIT -III

MAXWELLS EQUATIONS AND TIME VARYING FIELDS

Maxwell's Equations: For steady fields in point form and integral form-Faraday's law-displacement currentMaxwell's equations in point form and integral form for time-varying fields-Comparison of field and circuit theory. **Poynting Theorem**: Poynting vector

UNIT -IV

GUIDED WAVES

Waves between parallel planes: Transverse electric waves-Transverse magnetic waves-characteristic of TE and TM waves-TEM waves. Velocity of propagation-Attenuation in parallel plane guides-Wave impedance

UNIT -V

WAVEGUIDE THEORY

Rectangular wave guides: TE waves and TM waves in Rectangular waveguides-Dominant mode-cutoff frequency in wave guides-Impossibility of TEM waves in waveguides.

Circular waveguides: Wave impedance and characteristic impedance-Power flow in wave guides-Attenuation factor and Q of wave guides Transmission line analogy for waveguides

REFERENCE BOOKS

1. Matthew N. O. Sadiku., "Elements of Electromagnetics", Oxford University Press,3rd edition, First Indian edition 2006

2. Gangadhar K.A , "Field Theory", Khanna Publications,2000

3. Muthusubramanian R and Senthil Kumar N, "Electromagnetic field theory",Anuradha publications,1999

4. Edward Jordan and KG Balmain, "Electromagnetic Waves and Radiationg Systems", Pearson education, 2nd edition

DECE-404-ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

UNIT-I

MEASUREMENTS AND ERRORS

Accuracy-Precision-Significant Figures-Types of Errors-Statistical Analysis-Limiting Errors-Bridge Measurements (AC and DC bridges) - Analysis of Linear Systems-Time Domain Response-I Order response for Step Input-Ramp Input-Impulse Input- Bourdon Tube-Pressure Gauge-Measurement of Flow

UNIT -II

ELECTROMECHANICAL & DIGITAL INDICATING INSTRUMENTS PMMC

Mechanism-DC Ammeters and Voltmeters-Series and Shunt Type Ohmmeter-Alternating Current Indicating Instruments (Moving Iron instruments, electrodynamometer instrument)-D/A and A/D Converters Digital Voltmeters-Vector Voltmeter-Guarding Techniques-Automation in Voltmeter.

UNIT -III

SIGNAL GENERATION AND ANALYSIS

Sine Wave Generator-Sweep Frequency Generator-Pulse and Square wave Generator-Function Generator Analyzer-Wave Analyzer-Distortion Analyzer-Harmonic Distortion Analyzer-Spectrum Analyzer-Logic Analyzer.

UNIT -IV

OSCILLOSCOPES AND RECORDERS

Simple CRO - Dual Beam-Dual Trace-Sampling Oscilloscope-Analog and Digital Storage OscilloscopeRecorders-XY Recorder-Magnetic Recorders- Display Devices (LED, LCD, Alphanumeric displays).

UNIT -V

COMPUTER CONTROLLED TEST SYSTEMS

Testing an Audio Amplifier-Testing a Radio Receiver-Instruments used in Computer Controlled Instrumentation- Microprocessor based System and Measurement-Case Studies in Instrumentation-Electronic Weighing System-Digital Transducer.

REFERENCE BOOKS

1. Earnest .O Doeblin, "Measurement Systems Application and Design", McGraw Hill International editions, 4th edition, 1990.

2. A.K.Sawhney, "A Course in Electrical and Electronic Measurements and Instrumentation", Dhanapat Rai & Sons, 2000.

3. A.J.Bouwens, "Digital Instrumentation", McGraw Hill, 1986.

4. Geroge C. Barney, "Intelligent Instrumentation",IEEE, 1992.

DECE-404-P-ELECTRONIC MEASUREMENTS AND INSTRUMENTATION

1. Study of Thermistor Characteristics and Temperature Controlled Circuits
2. Study of Thermocouple
3. to determine output charateristics of LVDT and measure displacement using LVDT
4. Measurement of Semiconductor Devices with Multimeter
5. DC Current and Voltage Measurement
6. Measurement of different components and parameters like Q of a coil using LCR Q-meter
7. measurement of strain using STRAIN GAUGE.
8. To study differential pressure transducer & signal conditioning of output signal.
9. To study blockwise construction of a analog Oscilloscope & Function generator
10. To measure the earth resistance
11. Study of stroboscope

DECE-405-COMMUNICATION THEORY

UNIT- I

AMPLITUDE MODULATION SYSTEMS

Need for modulation-AM modulation systems-Modulation index-Phase diagram-Power relations-Efficiency Spectrum diagram of AM, DSB-SC & SSB systems.

Generation of AM Waves: Square law modulator-Product Modulator-Switching Modulator. Detection of AM waves: Envelope detector-Coherent detector. FDM

UNIT- II

ANGLE MODULATION

Frequency Modulation - Transmission Bandwidth of FM signals-Frequency spectrum-Phase Modulation relationship between FM & PM- Narrow Band FM & Wide Band FM.

Generation of FM Waves: Direct method- Indirect method of FM generation.

Detection of FM waves: Ratio Detector-PLL FM demodulator- Super heterodyne Receiver

UNIT -III

NOISE THEORY

Sources of Noise-Shot Noise-Resistor Noise-Calculation of Noise in Linear systems-Noise bandwidth-Available Power-Noise temperature-Noise in two port networks-Noise figure-Measurement of Noise figure-Signal in presence of noise-Narrow Band noise

UNIT- IV

NOISE PERFORMANCE OF AM & FM RECEIVERS

Noises in AM receiver threshold effect-Noise in FM receivers capture effect-FM threshold effect-Pre emphasis & De emphasis in FM

UNIT -V

INFORMATION THEORY

Information & Entropy- Rate of information-Discrete memory less channel-Joint Entropy & Conditional Entropy-Mutual information-Channel Capacity-Shannon's Theorem-Continuous Channel-Shannon-Hartley Theorem-BW S/N Trade-of

REFERENCE BOOK

1. K.Sam Shanmugam, "Digital & Analog Communication System", John Wiley & Sons.

2. B.P. Lathi," Modern Digital & Analog Communication", Prison Books Pvt Ltd., 1989

3. Simon Haykin, "Communication System", John Wiley & Sons, 4th Edition, 1991

4. R. Singh & S.D. Spare, "Communication Systems, Analog & Digital", Tata Mc Graw Hill, 1995

DECE-405-P-COMMUNICATION THEORY

1. Amplitude Modulator
2. Envelope Detector
3. Frequency Modulator using VCO
4. Frequency Demodulation using PLL
5. PAM modulation and demodulation
6. Pre emphasis and De-emphasis
7. Analog Multiplexing
8. Amplitude Modulation using PSpice
9. Frequency Modulation using PSpice
10. PAM modulation using PSpice
11. PAM demodulation using PSpice
12. pre emphasis and de emphasis using PSpice
13. Amplitude Modulation using MATLAB
14. Frequency Modulation using MATLAB

DECE-406- Energy Audit & Management

Unit- I

Energy Scenario: Commercial and Non-commercial energy, primary energy resources, commercial energy production, final energy consumption, Indian energy scenario, Sectoral energy consumption (domestic, industrial and other sectors), energy needs of growing economy, energy intensity, long term energy scenario, energy pricing, energy security, energy conservation and its importance, energy strategy for the future.

Basics of Energy and its various forms: Electricity basics – Direct Current and Alternative Currents, electricity tariff, Thermal Basics-fuels, thermal energy contents of fuel, temperature and pressure, heat capacity, sensible and latent heat, evaporation, condensation, steam, moist air and humidity and heat transfer, units and conversion, Metric Ton Oil Equivalent conversions.

Unit- II

Energy Management & Audit: Definition, energy audit, need, types of energy audit. Energy management (audit) approach-understanding energy costs, bench marking, energy performance, matching energy use to requirement, maximizing system efficiencies, optimizing the input energy requirements, fuel and energy substitution, energy audit instruments and metering, precautions, thermography, smart metering.

Unit- III

Heating, ventilation, air conditioning (HVAC) and Refrigeration System: Introduction to Psychometrics, Vapor compression refrigeration cycle, refrigerants, coefficient of performance, capacity, factors affecting Refrigeration and Air conditioning system performance and savings opportunities. Vapor absorption refrigeration system: Working principle, types and comparison with vapor compression system and saving potential, heat pumps and their applications, section on ventilation system, ice bank system, and performance assessment of window and split room air conditioners, Star labeled pumps, cold storage refrigeration, and humidification system.
Fans and blowers: Types, performance evaluation, efficient system operation, flow control strategies and energy conservation opportunities. Pressure drop calculation.

Unit- IV

Pumps and Pumping System: Types, performance evaluation, efficient system operation, flow control strategies and energy conservation opportunities. Energy conservation in boiler feed water pump, pumping systems for municipal drinking water, and sewerage, agriculture pump sets.
Cooling Tower: Types and performance evaluation, efficient system operation, flow control strategies and energy saving opportunities assessment of cooling towers. fan less cooling tower, natural draft cooling tower, cooling water treatment.

Lighting System: Light source, choice of lighting, luminance requirements, and energy conservation avenues. Light Emitting Diodes (LEDs), metal halides, fluorescent tube lights, Compact fluorescent lamps (CFL), labeling scheme, high efficiency street lighting, electronic ballast, occupancy sensors, energy efficient lighting controls.

Unit- V

Diesel/Natural gas Power Generating systems: Factors affecting selection, energy performance assessment of diesel conservation avenues. Waste heat recovery.
Energy conservation in Buildings and Energy Conservation Building Codes (ECBC): About Energy Conservation Building Codes (ECBC), building envelope, insulation, lighting, Heating, ventilation, air conditioning (HVAC), fenestrations, water pumping, inverter and energy storage/captive generation, elevators and escalators, star labeling for existing buildings, Energy Service Companies based case studies.

DME-406-P Energy Audit and Management

1. Residential House Wiring Using switches, Fuse, Indicator, Lamp and Energy Meter
2. Types of Wiring
3. Measurements of Electrical Quantities – Voltage, Current, Power and Power Factor in RLC Circuit
4. Measurement of Energy Using Single Phase / Three Phase energy Meter
5. Study Troubleshooting of Electrical Equipment
6. Study of Various Electrical gadgets
7. Assembly of Choke of Small Transformer
8. To prepare a project report on energy audit of following (any one)
8.1 Energy Audit assessments in power plants.
8.2 Energy Audit assessments in steel industry.
8.3 Energy Audit assessments in process industry (cement and textile).
8.4 Energy Audit assessments in buildings and commercial establishments.

DECE-501-Microprocessors & interfacing

UNIT-I

INTRODUCTION TO MICROPROCESSOR: Generation and evolution of microprocessors. Basic Architecture of 8-Bit Microprocessor. Tristate register and switch.

ARCHITECTURE OF INTEL-8085: registers, timing and control, add buffer and data buffer, interrupts control, serial input and output control, Pin out configuration
Demultiplexing and buffering the system bus.

UNIT-II

TIMING CYCLE OF 8085: Machine cycle, instruction cycle, Instruction fetch cycle, read cycle and write cycle, Bus idle cycle, Hold and Halt state
PROGRAMMING OF 8085: Software model of 8085A, Addressing modes of 8085A. Classification of instruction and Instruction set of 8085A, Concept of assembly language programming- basic assembler directives and labels.

UNIT-III

MEMORY INTERFACING : Generalized internal structure of memory device. Basic bus interface. Address space provided by 8085A, Address decoding. Interfacing ROM, static RAM and dynamic RAM.

I / O INTERFACING AND DATA TRANSFER: Interfacing I/O devices, Address decoding, Isolated I/O versus memory mapped I/O. Synchronous and asynchronous data transfer. Interrupt

driven data transfer, single interrupt, multiple interrupt- polling, priority interrupt controller, dairy chaining. Interrupts in 8085A – Software and hard ware – Vectored. Enabling, disabling and masking of interrupts. Direct memory access – Block transfer DMA – Cycle stealing DMA

UNIT-IV

I / O INTERFACING DEVICES: Functional block diagram and programming of : —
a) 8253(programmable counter), b) 8255(PPI), c) 8279(Keyboard and display controller)
Functional block description and control word development of :—
a) 8237(programmable DMA controller), b) 8259 (programmable interrupt controller), c) 8251 (USART). Interfacing DAC & ADC with 8085.

UNIT-V

INTRODUCTION TO 8086: Functional Block Diagram of 8086: Bus interface unit, execution unit, general purpose register, flag register, pointer and index register. Memory address space and generating a memory address. Dynamically allocable relocatable code Dedicated and reserved memory location. Pin configuration of 8086- minimum and maximum mode. Addressing mode of 8086. Instruction set of 8086.

DECE-501-P-Microprocessors & interfacing

Exp 1. Introduction to microprocessor 8086 & 8086 SDK.

Exp 2. Write a logic program for the addition & subtraction of two numbers with & without carry/borrow.

Exp 3. Write a logic program for the multiplication & division of numbers signed & unsigned both.

Exp 4. Write a logic program to find the square of a number without using multiplication instruction.

Exp 5. Write a logic program to find square of a number using look-up table.

Exp 6. Write a logic program to find the factorial of a given number.

Exp 7. Write a logic program to generate Fibonacci Series.

Exp 8. Write a logic program to find the smallest number in given stack of data.

Exp 9. Write a logic program to arrange the given stack in ascending order.

Exp 10. Write a program to check the given number is even or odd.

Exp 11. Write a program to generate multiplication table of given number.

Exp 12. Write a program to reverse the given number string.

DECE-502-Communication Theory-II

UNIT-I

PULSE CODE MODULATION: Idea of digital communication – Advantages of digital communication over analog communication. Information theory – Hartley-Shannon law – Basic principle of coding. Basic steps in PCM system**:** Filtering – Sampling – Quantizing – Encoding – Line coding (HDB3, AM1, CM1, NRZ, RZ). Block schematic description of transmitter and receiver of PCM system. Principles of linear and non-linear, quantization – Companding. Principles of amplitude shift keying, frequency shift keying and phase shift keying. Comparison between ASK, FSK and PSK. Basic idea of Quadrature Amplitude Modulation.

UNIT-II

DELTA MODULATION: Block schematic description of delta modulation technique.
Limitations of delta modulation – Slope overload and granular noise. Concept of adaptive delta modulation technique.

UNIT-III

MICROWAVE AMPLIFIER: Problems associated with conventional tubes at microwave frequency. Basic idea of amplification with velocity and density modulation in case of Multi-cavity Klystron and Travelling Wave Tube – Their efficiency, power output & frequency range of operation (no deduction) – Field of applications.

UNIT-IV

ANTENNA & WAVEGUIDE: Basic principles of antenna — Different types of antenna: Dipole antenna – Half wave and folded, microwave antenna – Horn antenna, parabolic antenna and helical antenna. Properties of antenna: Gain – Bandwidth – Beam Width – Impedance – Radiation Pattern. Antenna Arrays: Driven array and parasitic array. Wave Guides: Rectangular – Circular & Elliptical – Wave Guide Modes. Microwave Components: Directional Coupler – Attenuator – Isolator – Circulator.

UNIT-V

MULTIPLEXING: Idea of multiplexing and its necessity. Types of multiplexing: TDM and FDM.
TDM: Principles of time division multiplexing and synchronization in a digital communication system. PCM – TDM in modern applications (plesiochronous digital hierarchy and synchronous digital hierarchy). Frequency division multiplexing with practical examples, phase locked loop. Merits and demerits of TDM and FDM

DECE-502-P-Communication Theory-II

1. Introduction to Communication Systems and Circuits Lab.
   - Introduction to C.R.O.
   - Introduction to MATLAB 7.0.1.

2. To verify the sampling theorem.
   - Natural Sampling of an audio signal and its reconstruction.
   - Flat Top Sampling of an audio signal and its reconstruction.
   - Sample and Hold Sampling of an audio and its reconstruction.

3. To study Pulse Code Modulation System (PCM) System.
   - Generate, modulate and transmit a pulse coded signal.
   - Receive and demodulate a pulse coded signal.

4. To study TDM (Time Division Multiplexing) System.
   - Generate and transmit a TDM signal.
   - Receive and de-multiplex a TDM signal.

5. To study ASK (Amplitude Shift Keying) System.
   - Modulate a digital signal using amplitude shift keying.
   - Demodulate a amplitude shift keyed signal.

6. To study PSK (Phase Shift Keying) System.
   - Modulate a digital signal using phase shift keying.
   - Demodulate a phase shift keyed signal.

7. To study FSK (Frequency Shift Keying) System.
   - Modulate a digital signal using frequency shift keying.
   - Demodulate a frequency shift keyed signal.

8. Write a MATLAB code to illustrate the purpose of COMPANDING.
   - Matlab Code for μ Law Companding
   - Matlab Code for A Law Companding

9. Write a MATLAB code to generate a eye pattern for different communication Systems.

DECE-503-Indurstrial Electronics

UNIT-I

POWER DEVICES: Principle of operation of power BJT and IGBT with output characteristics. Switching characteristics of power diodes, power transistors; power MOSFET, IGBT, SCR. Protection of power devices overload protection, fuse protection, circuit breakers, transient protection, Zener, metal oxide resistors, turn on and odd snubber and transient voltage suppressor. Losses in power devices- on state losses, switching losses, losses in BJT, MOSFET and IGBT.

UNIT-II

Rectifiers and Inverters-Working and Principles of single and three phase rectifiers, Voltage source inverter,current source inverter.

UNIT-III

PROGRAMMABLE LOGIC CONTROLLER: Definition of programmable logic control system, advantages of PLCs. Block diagram of PLC system. Programming of PLCs, different methods Ladder programming of simple systems like traffic light controller. List of various PLCs different methods.

UNIT-IV

CONTROL OF DC AND AC MOTOR: SCR power supply for DC motor, speed regulation by armature voltage control. Speed control of AC induction motor (variable voltage control) Advantage of AC motor control DC motor. Types and principle of operation of stepper motor. Stepper Motor Control: Stepper Drive – Dual Voltage Drive – Chopper Drive.

UNIT-V

SWITCH MODE POWER SUPPLY: Principle of operation of buck converter, boost converter and buck-boost converter. Principle of operation of a PWM switching regulator using IC 3524 Advantage of AC motor control over DC motor.

A.C. POWER CONDITIONER CKTS: Block schematic description of uninterrupted power supply. Block diagram & brief study and CVT

DECE-503-P-Indurstrial Electronics

1. Characteristics of power BJT

2.Characteristics of power MOSFET

3.Characteristics of IGBT

4. Phase control of triac

5.Diac-triaclight dimmer circuit.

6.PUT relaxation oscillator.

7.SCR UJTlight dimmer.

DECE-504- Microwave Engineering

UNIT-I

MICROWAVE NETWORK THEORY: Introduction, Symmetrical Z and Y matrices for reciprocal network, Scattering matrix representation of multi port network properties of S-parameters, S matrix of a two port network with mismatched load, comparison between [S], [Z] and [Y] matrices. Relationship between Y, Z and ABCD parameters with S parameters, Numerical Problems.

UNIT-II

MICROWAVE PASSIVE DEVICES:

Coaxial Connectors and Adapters, Wave guide Choke Flanges, Matched Terminations, Short Circuit Plunger, Rectangular to circular wave guide transition, Tuning screws, Wave guide Corners, Bends and Twists, Windows, Coaxial line to Wave guide Adapters, Coupling Loops and Coupling Aperture, Attenuators, Phase shifters, Wave guide Tees - E plane Tee, H plane Tee, Magic Tee and their applications, Isolators, Circulators, Directional couplers. Scattering matrix derivation for all components, Numerical Problems.

UNIT-III

MICROWAVE VACCUM TUBE DEVICES: Introduction, Two cavity Klystron Amplifier – Mechanism and mode of Operation, Power output and Efficiency, Mode Curve, Equivalent circuit and Voltage gain, Beam loading; applications, Reflex Klystron Oscillator – Mechanism and mode of Operation Power output, efficiency, mode curve, equivalent circuit, Electronic Admittance, Modulation of Reflex Klystron; Applications, TWT amplifier, Principle of Operation gain and applications; Magnetron Oscillator – Hull cut-off voltage, Mechanism of Operation, Mode separation, Phase focusing, Power output and Efficiency, Applications, Numerical Problems.

UNIT-IV

MICROWAVE SOLID STATE DEVICES AND CIRCUITS: Microwave diodes – Crystal diode, Schottky diode, Harmonic Mixer; PIN diode – Operation switches, Phase switches & Attenuators – Gun diode – Mode of operation, Oscillator Circuit, IMPATT diodes – Mechanism of Operation, Application as Oscillator and Amplifiers, Tunnel diodes Oscillator amplifiers, Varactor diode – VCO, parametric amplifier, Microwave transistors – Unipolar and Bipolar, Applications, Numerical Problems.

UNIT-V

MICROWAVE MEASUREMENTS: Introduction, Tunable detector, Slotted line Carriage, VSWR meter, Spectrum analyzer, Network Analyzer, Power measurements – Schottky Barrier diode sensor, Bolometer sensor, power sensor, High power measurement, Insertion loss and Attenuation measurement, VSWR measurement – Low and High VSWR, Impedance measurement. Frequency measurement, Measurement of cavity Q, Dielectric measurement of a solid by Wave-guides method, Antenna Measurement – radiation pattern, Phase and gain.

DECE-504-P-Microwave Engineering

1. To Study the microwave bench & microwave components.

2. Study of the characteristics of Klystron Tube and to determine its electronic tuning range

3. To determine the frequency & wavelength in a rectangular wave-guide working on TE_{10} mode.

4. To determine the Standing Wave-Ratio and Reflection Coefficient.

5. To measure an unknown impedance with smith chart.

6. To study V-I characteristics of Gunn Diode

7. To study the following characteristic of Gunn Diode
   a. Output power and frequency as a function of voltage.
   b. Square wave modulation through PIN diode.

8. To measure the polar pattern and the gain of a wave-guide horn Antenna. (

9. Study the function of multi-hole directional coupler by measuring the following parameters.
   a. Main line and Auxiliary line VSWR.
   b. Coupling factor and directivity.

   a. Main line and Auxiliary line VSWR.
   b. Coupling factor and directivity.

10. To study Magic Tee.

DECE-505- Television Engineering

UNIT-I

INTRODUCTION : TV transmitter and receivers, synchronization. Television Pictures: Geometric form and aspect ratio, image continuity, interlaced scanning, picture resolution, Composite video signal: Horizontal and vertical sync, scanning sequence. Colour signal generation and Encoding**:** Perception of brightness and colours, additive colour mixing, video signals for colours, luminance signal, colour difference signals, encoding of colour difference signals, formation of chrominance signals, PAL encoder.

UNIT-II

TV SIGNAL TRANSMISSION AND PROPAGATION : Picture signal transmission, positive and negative modulation, VSB transmission, sound signal transmission, standard channel BW, TV transmitter, TV signal propagation, interference, TV broadcast channels, TV transmission Antennas.

TV CAMERAS : Camera tube types, Vidicon, Silicon Diode Array Vidicon, Monochrome TV camera, color camera. CCD Image Sensors.

UNIT-III

MONOCHROME TV RECEIVER **:** RF tuner, IF subsystem, video amplifier, sound section, sync separation and processing, deflection circuits, scanning circuits.

PAL-D Colour Receiver: Electron tuners, IF subsystem, Y-signal channel, Chroma decoder, Separation of U & V Colour Phasors, synchronous demodulators, Subcarrier generation, raster circuits.

UNIT-IV

COLOUR SIGNAL DECODING **:** PAL – D decoder, chroma signal amplifiers, separation of U and V signals, Color burst separation, Burst phase discriminator, ACC amplifier, Reference oscillator, Indent and colour killer circuits, RO phase shift and 180o PAL–SWITCH circuitry, U & V demodulators, Colour signal mixing.

UNIT-V

Digital transmission and reception of signals,DISH TV, DTH and Cable TV,transmission of TV signals through satellite and Transponders,Working principles of HDTV,DBS TV, IPTV and 3D-TV,Modern TV receivers with LCD,LED and Plasma Displays.

DECE-506- Computer Architecture and Organization

UNIT-I

INTRODUCTION: Arithmetic with Signed Magnitude Data: Addition, Subtraction, Multiplication, Division. Hardware Implementation and Algorithm: Addition, Subtraction, Multiplication, Division. Floating Point Arithmetic Operation: Basic consideration, Register Configuration, Addition, Subtraction, Multiplication and Division.

UNIT-II

CONTROL UNIT: Hardware Control with an example. Micro programmed Control-Control Memory, Computer Configuration.

CENTRAL PROCESSING UNIT: Stack Organization: Register Stack, Memory Stack, Revised Polish Notation, Evaluation of Arithmetic Expression; Introduction to Register Transfer Language(RTL). Interrupts: S/W and H/W Interrupts, Vectored and Non-Vectored Interrupts, Priority Interrupts, Interrupts Handling. RISC and CISC Architecture.

UNIT-III

PIPELINE & VECTOR PROCESSING: Parallel Processing, Pipelining : General Consideration, Arithmetic Pipeline, Instruction Pipeline (with example), RISC Pipeline (with example), Vector Processing: Vector operation, Matrix multiplication, Memory interleaving.Array Processor : SIMD Array processor, Problems.

UNIT-IV

INPUT OUTPUT ORGANIZATION: I/O Interface: I/O Bus and Interface Modules, I/O versus Memory Bus, Isolated versus Memory-Mapped I/O, Example of I/O Interface. Input-Output Processor: CPU-IOP Communication.

UNIT-V

MEMORY ORGANIZATION: Cache memory: Associative mapping, Direct mapping, Set-associative mapping, Writing into Cache, Cache Initialization, Cache level 1, level 2. Virtual Memory: Address space and Memory space; Address mapping using Pages, Associative memory page table, Page replacement.

DECE-601- Fibre Optic Communication

UNIT-I

INTRODUCTION TO OPTICAL FIBERS: Evolution of fiber Optic system – Element of an Optical Fiber Transmission link – Ray Optics – Optical Fiber Modes and Configurations – Mode theory of Circular Wave guides – Overview of Modes – Key Modal concepts – Linearly Polarized Modes – Single Mode Fibers – Graded Index fiber structure.

UNIT-II

SIGNAL DEGRADATION IN OPTICAL FIBERS: Attenuation – Absorption losses, Scattering losses, Bending Losses, Core and Cladding losses, Signal Distortion in Optical Wave guides – Information Capacity determination – Group Delay – Material Dispersion, Wave guide Dispersion, Signal distortion in SM fibers – Polarization Mode dispersion, Intermodal dispersion, Pulse Broadening in GI fibers – Mode Coupling – Design Optimization of SM fibers – RI profile and cut-off wavelength.

UNIT-III

FIBER OPTICAL SOURCES: Direct and indirect Band gap materials – LED structures – Light source materials – Quantum efficiency and LED power, Modulation of a LED, Laser Diodes – Modes and Threshold condition – Rate equations – External Quantum efficiency – Resonant frequencies – Laser Diodes structures and radiation patterns – Single Mode lasers – Modulation of Laser Diodes, Temperature effects, Introduction to Quantum laser, Fiber amplifiers.

UNIT-IV

FIBER OPTICAL RECEIVERS: PIN and APD diodes – Photo detector noise, SNR, Detector Response time, Avalanche Multiplication Noise – Comparison of Photo detectors – Fundamental Receiver Operation – pre-amplifiers - Error Sources – Receiver Configuration – Probability of Error – The Quantum Limit.

UNIT-V

DIGITAL TRANMISSION SYSTEM: Point-to-Point links – System considerations – Fiber Splicing and connectors – Link Power budget – Rise-time budget – Noise Effects on System Performance – Operational Principals of WDM, Solutions

DECE-601-P-Fibre Optic Communication

Experiment with Optical fibre :

To calculate attenuation constant, bending loss and numerical aperture of optical fibre

Experiments using LED module : Study of DC characteristics.

I-V characteristics of LED (i) using optical fibre between LED and power meter and (ii) without using optical fibre.

P-I characteristics of LED (i) using optical fibre between LED and power meter and (ii) without using optical fibre.

Experiment with fibre Optic analog link :

Input-output characteristics using long optical fibre. Calculation of attenuation per unit length of optical fibre.

DECE-602-Control system

UNIT-I

Basic Elements of Control System – Open loop and Closed loop systems - Differential equation - Transfer function, Modeling of Electric systems, Translational and rotational mechanical systems - Block diagram reduction Techniques - Signal flow graph

UNIT-II

Time response analysis - First Order Systems - Impulse and Step Response analysis of second order systems - Steady state errors – P, PI, PD and PID Compensation

UNIT-III

Frequency Response - Bode Plot, Polar Plot, Nyquist Plot - Frequency Domain specifications from the plots - Constant M and N Circles - Nichol's Chart - Use of Nichol's Chart in Control System Analysis. Series, Parallel, series-parallel

UNIT-IV

Stability, Routh-Hurwitz Criterion, Root Locus Technique, Construction of Root Locus, Stability, Dominant Poles, Application of Root Locus Diagram - Nyquist Stability Criterion - Relative Stability

UNIT-V

State space representation of Continuous Time systems – State equations – Transfer function from State Variable Representation – Solutions of the state equations - Concepts of Controllability and Observability

DECE-603-Computer Network

UNIT-I

Introduction of Computer Networks and Data Communication Services. Roles of Network Hardware and structured Network software.

UNIT-II

The Reference Models: OSI, TCP/IP. Mention of Physical layers and significance of circuit switching, packet switching, message switching, and ISDN services.

UNIT-III

ATM and transmission in ATM network, Advanced mobile phone system (AMPS). Concept of global system for mobile communication (GSM), satellite and fiber optic networks.
Design of data link layer, data link protocol, framing, error and flow control. Error detection and correction. Example of data link protocol.

UNIT-IV

The multi-access channel, multiple access protocols, wireless LAN protocols, IEEE standards. Network layers, its internal organization, routing algorithms, hierarchical routing, routing for mobile hosts, congestion control algorithms.

UNIT-V

The network layer in Internet, the IP protocol/addresses/header. The network layer in ATM networks. Transport layer services, Internet transport protocols, the ATM AAL layer protocols, protocols for Gigabit networks. Network security concepts. The Electronic Mail, Email gateways, the World Wide Web, Multimedia concepts.

DECE-603-P-Computer Network

1. Basic networking commands
2. Introduction of Basic Network Devices
3. Straight and Cross Cable Construction
4. IP Addressing and Subnetting
5. Introduction to Packet Tracer and Simple Network Building
6. Hub and Switch usage
7. Switched Network
8. Building a Peer-to-Peer Network
9. Configure workstations and routers
10. Router Configuration (RIP)

DECE-604- Object Oriented Programming

UNIT-I

Classes – objects – Declaring & Creating Objects – Concept of members variable, methods Private, Public, protected variable.

UNIT-II

Constructors: Constructor with parameter – Constructor without parameter – Copy Constructor, Destructor, Passing objects to method.

UNIT-III

Inheritance: Private, Public, protected inheritance – Single, Multiple inheritance – Multilevel, hierarchical inheritance.

UNIT-IV

Operator overloading & polymorphism: Unary operator overloading like ++, - - etc. – Binary operator overloading like arithmetic operator – Comparison operator, Assignment operator etc. –

UNIT-V

Introductory problem on virtual function & friend function.
Class Templates and Exception handling.

DECE-604-P-Object Oriented Programming

1. Assignments on class, constructor, overloading, inheritance, overriding
2. Assignments on wrapper class, arrays
3. Assignments on developing interfaces- multiple inheritance, extending interfaces
4. Assignments on creating and accessing packages
5. Assignments on multithreaded programming
6. Assignments on applet programming