UNIVERSITY OF DELHI

Syllabus

of
B.E. Computer Engineering
at
Delhi College of Engineering

Semester I
Semester II
Semester III
Semester IV
Semester V
Semester VI
Semester VII
Semester VIII

Syllabus applicable for students seeking admissions to the B.E.
(Computer Engineering Course)

FACULTY OF TECHNOLOGY
UNIVERSITY OF DELHI

NEW SCHEME OF EXAMINATION

1. There shall be the following four year Degree Courses under the Faculty of Technology :-

    (i) Bachelor of Engineering (Electrical)

    (ii) Bachelor of Engineering (Electronics and Communication)

    (iii) Bachelor of Engineering (Mechanical)

    (iv) Bachelor of Engineering (Civil)

    (v) Bachelor of Engineering (Production and Industrial)

    (vi) Bachelor of Engineering (Polymer Science and Chemical Technology)

    (vii) Bachelor of Engineering (Computer)

    (viii) Bachelor of Engineering (Instrumentation and Control)

2. In addition to the conditions laid down in Ordinance T, a candidate seeking admission to any of the above Courses of study for the Bachelor's Degree should satisfy the following conditions.

(a) Education Qualifications :-

A Candidate passing any one of the following examinations and securing 60 per cent or more marks in the aggregate of Physics, Chemistry and Mathematics shall be eligible for admission to the first Semester of Bachelor of Engineering Course provided he/she has passed in each subject separately—

    (i) Senior School Certificate Examination (12 Year Course of the Central Board of Secondary Education (C.B.S.E.), New Delhi.

    (ii) Indian School Certificate Examination (12-Year Course) of the Council for Indian School Certificate Examination, New Delhi.

    (iii) B.Sc. (Gen.) Group 'A' final Examination of the University of Delhi or equivalent examination.

    (iv) B.Sc. (Hons.) Examination in Physics, Chemistry and

Mathematics of the University of Delhi with Combination of Physics, Chemistry, Mathematics and equal weightage to the subsidiary subjects or equivalent examination.

(v) Any other examination recognised as equivalent to the Senior School Certificate Examination of the C.B.S.E. by the University of Delhi.

A Candidate must additionally have passed English as a subject of study either at the 10th class level or 12th class level (core or elective).

Note—There shall be no direct admission to any level of the Courses above the 1st Semester.

3. Under each B.E. Degree Course certain subjects are offered which can be classified as Theory/Practical/Drawing/Design/Project. Practical Training. Further classification is based on the relationship of the subjects with the degree courses admitted to, namely Humanities Social Science/Basic Sciences/Allied Engineering. Departmental, Core etc.

4. A student who joins the first semester will be automatically, deemed to have registered for the subjects which are listed under the first Semester of the SUGGESTED SCHEME OF LEARNING Every student is required to register for the subjects to be taught in the second and subsequent semesters. This process of registration shall start just before the start of next semester. The student will also indicate during registration of subject/subjects of earlier Semester(s) in which he/she desires to appear, if otherwise eligible. Such a student will be allowed to appear in the End Semester Examination and his/her marks of mid terms activities will remain unaltered.

Since attendance is compulsory, a student will be permitted to register for course/courses which he can attend. The number of theory subjects permitted will not be more than five. The total darting of contact periods should not ordinarily exceed thirty hours per week.

5. B.E. Degree shall be awarded if a student has earned a minimum of 220 credits as specified in each degree programme subject to break up and compulsory credit as mentioned there in. However, as student may register in subjects leading to a maximum of 240 credits in the

entire course.

A student should keep a watch on this progress and register in those papers in which he must earn the credit to satisfy the above requirement of the particular degree.

If a student earns more than a specified minimum credit for degree the best marks in the minimum credits (satisfying the above conditions) will be considered for the purpose of classification of result.

6.   EVALUATION AND REVIEW—

The Committee of Courses and studies in each department shall specify the following for the degree course —

    (a)   Suggested Scheme of Learning—

    (b)   Minimum credits needed for the degree course and break up in terms of classification of course i.e.

    (i)   Humanities and Social Sciences

    (ii)   Basic Sciences

    (iii)   Allied Engineering

    (iv)   Departmental Core

    (v)   Practical Training

    (vi)   Unspecified/Elective and

    (vii)   Major Project

The Committee of Course and Studies in each department shall appoint one or more Evaluation-cum-Review Committees each dealing with a group of subjects. This E.R.C. consist of the teachers who are likely to teach subjects in the group.

The E.R.C. has the following functions—

    (i)   To recommend appointment of paper setters/examiners of various examinations at the start of each Semester.

    (ii)   To get prepared quizzes, assignments, test papers etc. for the mid-term and the end semester examination and to get them evaluated. Normally each concerned teacher, who is also a member of E.R.C., will do this job for his class. However, in exceptional circumstances any part of the work will be entrusted to some other member of

the E.R.C.

(iii) The mode of evaluation of the mid-term activities whose weightage shall be 30% and the end of term examination whose weightage shall be 70%. (The mid-term activities will be of one mid term test of 20% weightage which will be supplemented by assignments, quizzes etc. for a theory course with weightage of 10%). For a Practical Course, 30% weightage be given for internal evaluation and 70% for End Semester the E.R.C. Chairman will send to the University the Consolidated marks for the mid-term activities and the End Semester in separate column for tabulation and for declaration of result.

(iv) To consider the individual representation of students about evaluation and take the remedial action if needed. After scrutinizing the E.R.C. may alter the marks awarded upward/downward. The decision of the ERC shall be final. The candidate shall apply for the same on a prescribed performa along with the evaluation fee prescribed by the University from time to time only for the End Semester Examination with in seven days from the date of declaration of result.

(v) to moderate the quiz/assignment/Test papers given by each concerned teacher in his class with a view to maintain uniformity of standards and course coverage amongst various classes and to attain stipulated level of learning.

(vi) To review and moderate the mid term and end of term results of each class with a view to maintain uniformity of standards and after finalisation, to submit the same for classification of the results.

(vii) to lay guide-lines for teaching a subject.

7. CLASSIFICATION OF RESULT—

A student has to secure 40% or more marks in a subject evaluation to earn the credits assigned to the subject. A student after having secured he minimum credits as needed for the degree course will be eligible for he award of degree. The final result will be evaluated as below—

Each subject will carry 100 marks.

$$\text{Average Marks} = \frac{\sum (\text{Credits} \times \text{Marks Secured})}{\sum (\text{Credits})}$$

*(See caluse 5 for best grades in the minimum credits).

The final result will be classified based on the average marks as follows—

First Class with Distinction 75% or more

First Class 60% or more but less than 75%

Second Class 50% or more but less than 60%

Pass Class 40% or more but less than 50%

8. A student has to put in a minimum of 75% attendance separately in each subject for which he has registered. A relaxation up to a maximum of 25% may be given on the production of satisfactory evidence that—

(a) The student was busy in authorized activities.

(b) The student was ill.

Note—

(i) A student should submit the evidence to the above fact within three working days of resuming the studies. Certificates submitted later will not be considered.

(ii) No relaxation in attendance beyond 25% is permitted in any case.

(iii) The registration of a student stands cancelled if his attendance requirements are not satisfied in the subject.

The duration of the course is not less than 8 Semesters and the span is not more than 14 semesters.

A student who earn 15 credits or less at the end of the first semester will receive a warning for his/her poor performance, if he fails to earn at least 25 credits at the end of second semester, he has to leave the course and institution.

In case a student has not earned a minimum of 100 credits at the end of eight semester, his admission to the course and the institution stand cancelled. The admission stands cancelled at the end of 14th Semesters in any case.

10. The Institution/University may cancel the registration of all the subjects in a given semester if—

    (i) The student has not cleared the dues to the institution, hostel.

    (ii) A punishment is awarded leading to the cancellation.

At discretion of the institution the result may be withheld even if the registration of the student stands.

11. There shall be a Central Advisory Committee consisting of the following—

    (a) Dean, Faculty of Technology, Chairman of the Committee)

    (b) Heads, of the Institutions

    (c) Heads of the Departments in the Faculty of Technology.

This Committee shall have the following functions—

    (i) Lay guidelines for the process of registration.

    (ii) Give an interpretation of the rules in case of difference of opinion which shall be binding on all.

12. Under very exceptional conditions minor relaxations in rules may be allowed and implemented by the central Advisory Committee. However, same relaxation in rules can not be granted in a subsequent semester. In case the conditions warrant such a relaxation again, the rules shall have to be amended.

GENERAL NOTES—

1. For all Theory Papers (Code—TH) there is one mid-semester test of 30 marks (20+10 Assignments) and an end-semester exam of 3 hours duration for 70 marks. The total marks for the Theory Papers in thus 100.

2. For all Practical Papers (Code—PR) there is semester assessment of 30 marks and an end-semester exam of 3/4 hours duration for 70 marks. The total marks for the Practical Paper is thus 100.

3. For all valuation of Sessional (Code—VS) there is semester assessment of 100 marks. There is no end-semester exam for these courses.

4. At VII and VIII Semester level there is assessment of Practical Training Reports by a July constituted Board. The report to be submitted by the student after eight weeks of Industrial Training undergone during summer/winter breaks. The total marks associated with each Practical Training Report is 100 marks of which 30 marks are awarded by the Department on the basis of supervision of Industrial Training.

5. At VIII Semester level there is assessment of Project Report by a duly constituted Board. The Report is to be submitted by the student of the Project work performed at the VII and VIII Semester levels. The total marks associated with the Project Report is 100 marks of which 30 marks are awarded by the Department on the basis of guidance of Project Work.

6. The total credits in all scheme of examinations to B.E. Courses upto VIII Semester will be 232 and the denominator for calculation of average marks for final result will be 220.

7. The Project and the Practical Training at VII and VIII Semester are mandatory.

8. Candidates securing 228 to 232 credits are declared to have passed B.E. Final examination.

9. Candidates securing 221 to 227 credits are declared to have passed B.E. Final examination, provided they skip/fail in not more than 4 credits in CORE.

10. Candidates securing exactly 220 credits are declared to have passed B.E. Final Examination, provided they skin/fail in not more than 4 credits in CORE, not more than 4 credits in ALLIED ENGINEERING, and not more than 4 credits in APPLIED SCIENCES AND HUMANITIES.

Suggested Scheme For B.E. Computer Engineering

1CO	5 4		Credits & Type
THI	COE101	Humanities	4H
TH2	COE102	Mathematics I	4H
TH3	COE103	Physics I	4H
TH4	COE104	Chemistry	4H

TH5	COE105	Manufacturing Processes	4 A
PR1	COE106	Engineering Drawing T	3 C
PR2	COE107	Physics I	2 H
PR3	COE108	Chemistry	2 H
PR4	COE109	Workshop I	2 A

2CO	5 4		29
TH1	COE111	Principles of Electrical Engg.	4 A
TH2	COE112	Applied Mechanics	4 A
TH3	COE113	Mathematics II	4 H
TH4	COE114	Introduction to Programming	4 C
TH5	COE115	Physics of Materials	4 H
PR1	COE116	Principles of Electrical Engg.	2 A
PR2	COE117	Applied Mechanics	2 A
PR3	COE118	Introduction to Programming	2 C
PR4	COE119	Physics of Materials	2 H

3CO	5 4 1		28
TH1	COE201	Electronics I	4 C
TH2	COE202	Circuit and Systems	4 C
TH3	COE203	Power Apparatus	4 A
TH4	COE204	Electrical Measurements	4 A
TH5	COE205	Mathematics III	4 H
PR1	COE206	Electronics I	2 C
PR2	COE207	Power Apparatus	2 A
PR3	COE208	Electrical Measurement	2 A
PR4	COE209	Machine Drawing	3 C
VS1	COE210	Programming I	1 C

| 4CO | 5 5 2 | | 30 |

TH1	COE211	Electronics II	4 C
TH2	COE212	Electromagnetic I	4 A
TH3	COE213	Data Structure	4 C
TH4	COE214	Digital, Circuits and System I	4 C
TH5	COE215	Principles of Comm. Engg.	4 C
PR1	COE216	Electronics II	2 C
PR2	COE217	Digital, Circuits and System I	2 C
PR3	COE218	Principles of Comm. Engg.	2 C
PR4	COE219	Electric Workship and Electric Drg.	2 A
PR5	COE220	Practical Training (Duration 4 weeks in winter break College workship [Drawing/Drafting using CAD facilities]	2 C
VS1	COE221	Report Writing	1 H
VS2	COE222	Programming II	

5CO	5 3 1		Credits
TH1	COE301	Principles of Computer Graphics	4 C
TH2	COE302	Descrate Maths and Design of Alg.	4 C
TH3	COE303	Computer System Org.	4 C
TH5	COE305	Industrial Org. and Mana. Eco.	4 A
PR1	COE306	Computer Systems Org.	2 C
PR2	COE307	Linear Integrated Circuits	2 C
PR3	COE308	Principles of Computer Graphics	2 C
VS1	COE309	Programming III	1 C

6CO	5 3 2		27
TH1	COE311	Microprocessors	4 C
TH2	COE312	Info System and Date management	4 C
TH3	COE313	Operating System	4 C
TH4	COE314	Control Engineering	4 C
TH5	COE315	Advance Computer Architecture	4 C

PR1	COE316	Microprocessors	2 C
PR2	COE317	Info Systems and Date management	2 C
PR3	COE318	Control Engineering	2 C
VS1	COE319	Programming IV	1 C
VS2	COE320	Practical Training (Duration 3 weeks in winter break in Electrical/Electronics workshop)	2 C

7CO	5 4 1		29
TH1	COE401	Computer and Translator Design	4 C
TH2	COE402	Digital Circuits and Systems II	4 C
TH3	COE403	Microprocessor Applications	4 C
TH4	COE404	Elective I	4 C
TH5	COE405	Elective II	4 C
PR1	COE406	Computer and Translator Design	2 C
PR2	COE407	Digital Circuits and System II	2 C
PR3	COE408	Electives I and II	2 C
PR4	COE409	Practical Trainign	3 M
VS1	COE410	System Programming Language	1 C

8CO	3 3 1		30
TH1	COE411	Computer Comm. and Electronics Swng.	4 C
TH2	COE412	Elective III	4 C
TH3	COE413	Elective IV	4 C
PR1	COE414	Elective III and IV	2 C
PR2	COE415	Project	8 M
PR3	COE416	Practical Training	4 M
VS1	COE417	Seminar/Reports	1 C

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Total 232

COE-404 AND COE405 (Elective I and II)

any two of the following Papers—

1. Signal Processing I
2. Biomedical Electronics
3. Computer Aided Design
4. Theory of Automata and Formal Language
5. Artificial Intelligence
6. Modelling and Simulation

COE—412 and COE—413 Elective (III and IV)

Any two of the following Papers—

1. Optimization Methods
2. Signal Processing II
3. Fault Tolerent Computing
4. Introduction to VLST Design
5. Data Base Management
6. Distributed Computer Control
7. Engg. Methodology for software production.
8. Software Engg.
9. Robotics
10. Expert Systems

(Computer Engineering) I Year I Semester Examination Theory.
—I COE 101 Humanities

a— EC—101 & EE—101 & IC—101

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TEXT: Essay, Short Stories and one Act Plays :

Editor : R.K. Kaushik & S.C. Bhatia Published by Oxford University Press

The following chapters are prescribed for study :

(i) Essays :

1. Nehru the Democrat by M. Chalapathi Rau

2. Bores by E. V. Lucas

3. Freedom by George Bernard Shaw

4. What I require from Life by J.B.S. Haldane

5. Student Mobes by J.B. Pristley

(ii) Short Stories :

1. The Fortune Teller by Karel Capek

2. Grief by Anton Chekov

3. The Coll's House by Katherine Mansfield

(iii) One Act Plays

1. A Marriage proposal by Anton Chekow

2. The Boy comes Home by A.A. Milne.

(B)   ENGLISH LANGUAGE PRACTICE

Applied Grammar :

Common errors, use of words, Synonymous and Antonyms, Formation of words Prefixes and Suffixes.

Presentation of Technical Information :

Technical description of (i) Simple objects, tools and appliances (ii) Processes and operations (iii) Scientific principles.

Composition :

Comprehension, Dialogues-conversational and colloquial idioms.

Spoken English :

Practice in self expression talks, lectures and speeches.

B.E. (Computer Engineering) I Year I Semester Examination Theory Paper-II COE-102 Mathematics-I

(Same as EC-102 and IC-102)

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Algebra :

Partial Fraction, Hyperbolic and Inverse hyperbolic functions De Moivre's Theorem and its applications, Relations between circular and hyperbolic functions, Positive term infinite series and their convergence (Comparison and Ratio tests), Alternating series.

Differential Calculus :

Derivatives of hyperbolic functions, successive differentiation and Leibnitz's theorem. Taylor's and Maclaurins' series, Maxima and minima of functions of one variable, Curvature and radius of curvature Points of inflection.

Integral Calculus :

Integration by partial fractions, Integration of forms I, I/R where R $= ax2 + bx + c$. Properties of definite Integrals.

Reduction formulae, Application of integration to area, Lengths of area, surface and volume of .... of revolutions .... pezoieal and simpson's rules.

B.E. (Computer Engineering) I Year I Semester Examination Theory Paper-III COE 103 Physics-I

(Same as EC-103 & EE-103 and C-103)

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Relativity :

Absolute and inertial frames of references, Newtonian and Galiliar. Relativity, Galilian Transformations, Michelson Morley experiment and its implications, Einstein's theory of relativity, Lorentz Transformations Einstein's law of addition of velocities, Mass variation with velocity, Concept of energy and momentum as four vector Einstein's mass energy relation.

Inverse Square Law of Forces :

Fundamental interactions, Electromagnetic and gravitational integrations, Force and potential control forces.

Invariance and Symmetry Principles :

Invariance of a physical quantity, Laws of conservation of momentum, Energy and charge, Concept of symmetry and its implications.

Waves and Oscillations :

Free damped and forced oscillations, Resonant vibrations with application, Sharpness of renounce, Quality factor, formation of waves in strings rods and air, Acoustic waves, Acoustic impedance Transmissions through partitions, Ultrasonics and its applications.

Interference of Light :

Wave theory or light, Superposition principle, Double slit experiment, Bi-prism and Newton experiment, Theory of interference in thin film, interference filters, Michelson's interferometer.

Diffraction of Light :

Fresnel and Fraunhofer class of diffraction, Diffraction at straight edge, Cornices spiral, Fraunhofer diffraction, at a slit and its extension for number of slits, Diffraction gratings, Resolving, power of optical instrument Telescope, Prism and grating.

Polarisation of Light :

Elementary aspes's of E.M. theory of light, Polarization, Reflecti.. and transmission, Brewster law, Polarization due to pile of plates and dou:.. reflection. Elliptically and circularly polarised light, Axial prism Qu-- and half wave places.

Optical Instrument

Candinal points of a coaxial lens system, Defects in images, Sphere and chromatic aberr.tion, Nedal slide assembly, Eye pi. ce

I.E. (Computer Engineering) 1 Year 1 Semester
Examination Theory Paper—IV

GGE—104 Chemistry

(Same as E.C.—104 & E-104 & IC-104)

Chemical Kinetics :

Rate constant, Order and molecularity of a reaction, 1st, 2nd, 3rd order reactions, Methods of determining order of reactions, Effect of catalyst on reactoins rate, Activating energy, Industrial applications of catalysts.

Electro-Chemistry :

Transport number, Galvanic Cells, E.M.E. and its measuremcits. Nearnst equation of electrode potentials, Reference and Indicator electrodes at measurements, Solar energy.

Phase Rule :

Phase diagrams and phase transformations in Pb-Ag and Cu- systems.

Thermal Methods of Analysis :

Elementary discussions of thermograviometric analysis, Differential thermal analysis and differential scanning calorimetry.

Metals and .... Metals of Elements :

S and P block elements, Bonding in complexes, Molecular .... for magnetic properties and colour, Extraction and technical

applications of Titanium, Vanadium, Zirconium, Tungsten and Uranium.

Alloy Classification :

Necessity for making alloys composition, properties and uses of following alloys Brass, Bronze, Gun metal Durahimin, Effect of alloying elements like C, NI, MN, SI, V, Mo, W and Co on the properties of steam.

Electronic-Effects :

Inductive effect, Conjugation and resonance and their effect on physical and chemical properties of molecules, Carbonion and carboniumions and free radicals.

Organic Polymers :

Polymerizaiton, Effect of polymer structure on properties, Production, properties and technical applications of some important thermoplastics and thermosetting resins, Natural rubber and elastomers (SNR, GR—I, GR—P) polyurethane and silicone) Molecular weights.

Otis. Fats, Waxes and Detergents :

Production and physico-chemical properties of fatty acids and Glycerides, Manufacture of edible fats, soap, Glycerine, waxes, essential oils, perfumes an cosmetics.

B.E. (Computer Engineering) I Year I Semester
Examination Theory Papers

COE-105 Manufacturing Processes

(Same as EC—105 & EE—105 and IC—105

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Materials :

Compositions, Properties and uses of Wrought iron, Pig iron, Cast iron, Malleable iron, S.G. Iron, Carbon and alloy steels, Cooper Aluminium, Lead, Brass, Bronze, Duralumin. Bearing metals, High temperature metals, Cutting tool materials.

Casting Processes :

Principles of metal casting, pattern materials, Types and Study of moulding, Sand moulding tools, Moulding materials, C of moulds, Description and Operation of cupola. Special castin e.g. diecasting, permanent mould casting, centrifugal casting, casting.

Smithy and Forging :

Basic operations e.g. upsetting, fullering, flattening swaging, tools and appliances, drop forging press forging.

Metal Joining :

Welding; Principles, Classification of welding te Oxyacetylens Gas Equipment and field of application, Arc-Weld Arc, Carbon Arc, Submerged arc and atomic hydrogan are weldir resistance welding, Spot, Seam, Butt, Butt seam and percussio Flux, composition, properties and function, Electrodes.

Types of joints and edge preparation

Brazing and soldering.

Sheet Metal Work :

Common processes, Tools and equipment, Metals used Standard specification for sheets.

Bench Work and Fitting :

Fitting, Sewing, Chipping, Thread cutting (die), Tappin; hand tools, Marking and marking tools.

B.E. (Computer Engineering) I Year I Semester
Practical Paper—I COE—106 Engineering Drawing—I

Same as EC—106 & IC—106

Introduction

Instruments and their uses lettering construction an various scales, dimensioning as per I.S.I. 696-1972.

Engineering Curves : parabola, hyperbola, ellipse, cycloids spiral, helix and loci of points of simple moving mechanism (4 ba

Projections : straight lines, planes and solids, development of surfaces of right and oblique solids, section of solids, interpenetration and intersection of solids, isometric and oblique parallels projection of solids.

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B.E. (Computer Engineering) I Year I Semester
Practical Paper II COE—107 Physics—I

Based on course work corresponding to COE—103

Physics—I

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B.E. (Computer Engineering) I Year I Semester
Practical Paper II COE—108 Chemistry

Based on course work corresponding to COE—104

Chemistry

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004

B.E. (Computer Engineering) I Year I Semester
Practical Paper II COE—109 Workshop

Based on course work corresponding to COE—103

Manufacturing Processes

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004

B.E. (Computer Engineering) I Year II Semester
Examination Theory paper—I

COE—111 Principles of Electoral Engineering

(Same as EE—111 and EC—111 & IC—111)

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Properties of Conductors and Insulators :

Factors effecting resistivity of conductors and insulators, resistance temperature co-efficient, insulation resistance, non-linear resistance and resistors, incremental and differential resistance.

Electromagnetism

The magnetic, circuit, calculations, magnetic screening, B-H Curve and differential permeability, hysteresis, electromagnets, self and mutual Inductance, non-linearity of inductance.

D.C. Circuit :

Ohm's law, Kirchoff's Law, Networks simplification by loop current and node voltage methods, Star delta transformations.

Alternating Currents :

Introduction to alternating quantities peak, average and R.M.S. value of sinusoidal and few typical non-sinusoidal wave forms, crest factor and form f..... Phasor representation in rectangular, polar and exponential forms, Series and Parallel circuits containing R-L-C and concept of phase, active and reacting power and meaning of power factor, the J operator.

Resonance :

Series and parallel resonance, Q-factor of a coil banowidth, relation between Q, band width and reconant frequency, Half power points

Polyphase Circuits :

Analysis of balance 3-phase circuits, Introduction to unbalanced circuits.

Measuring Instruments :

Construction of permanent magnet moving coil ammeters and voltmeters, torque equation, construction of moving iron instruments, attraction and repulsion type, torque equation.

B.E. (Computer Engineering) I Year II Semester
Examination Theory Paper-II

COE-112 Applied Mechanics

(Same as EC—112 and EE—112 & IC—112)

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Basic Laws :

Force, moment of a force, couple, equivalent force system, equation of equilibrium, solution of simple plane trusses by analytical and graphical methods, frictional force, first moment and second moment of area.

Simple Stresses and Strains :

Description of tensile, compressive shear and volumetric stresses and strains, complementary shear stress, lateral strain and Poisson's ratio.

Bending Moment and Shear Force Diagrams :

Cantilevers and simple supported beams carrying various types of loads.

Theory of Simple Bending :

Determination of bending stresses, deflection of beams.

Torsion :

Stresses and strains in pure torsion for solid and hollow circular shafts, power transmitted by shafts.

Combine Stresses and Strains :

Principle stresses, strains, combined torsion, bending and direct stresses, strains, combined torsion, bending and direct stresses equivalent bending twisting moments.

B.E. (Computer Engineering) I Year II Semester
Examination Theory Paper-III

COE—113 Mathematics-II

(Same as EC—113 and EE—113 & IC—113)

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Differential Calculus :

Partial differentiation, Total differentiation, Taylor's series for functions of two variables, Maxima and Minima of functions of two or more variable.

Matrices :

Inverse or a matrix, Rank of a matrix, Consistency and solution of simultaneous equations, Linear transformations, Vector spaces, Characteristic equations, Eigen values and Eigen vectors, Caley-Hamilton theorem.

Integral Calculus :

Double and triple integrations, Change of order of integration, Volumes of simple solids.

Differential Equations :

Linear differential equations of first order and first degree (Leibnitz and Barnolli's forms), General linear differential equations with constant coefficients, Operator D, Complimentary function, particular integral, Simultaneous linear differential equations, Solution of differential equation in power series, Frobenius method.

Laplace Transformation :

Laplace Transformation, Inverse Laplace Transformation, Convolution, Theorem, Application to linear differential equations with constant coefficient, Unit step function, Impulse function, periodic functions.

B.E. (Computer Engineering) I Year II Semester
Examination Theory Paper-I

COE—114 Introduction to Programming

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An overview identifying computer components and their functions Number System, Machine Assembly and High Level Languages, Problem Solving, Algorithms, Techniques in problem solving, flow charting, pseudo-code, step wise refinement, Overview of BASIC Programming Language, Introduction to structured Programming, with reference to PASCAL Data type, Basic Control Structures, Sequences, Selection and iteration, Arrays, Records, Subprograms and parameters, Simple I/O, Simple example from Data Processing Numeric Computation etc.

B.E. (Computer Engineering) I Year II Semester
Examination Theory Paper-V

COE-115 Physics of Material

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Fundamentals of Quantum Mechanics and Crystal Structure

Matter Waves and De-Broglie Hypothesis, Uncertanity Principles wave packets, Schrodzinger's Wave equation, Interpretation of wave function, Simple Bigen value problems and degeneracy.

Bravis Lattices. Miller indices, Simple crystal structure different and of Bonding.

Metallic Conductor

Energy distribution of electrons in a metal, Fermi-Dirac probability function. Fermi level, conduction process.

Semi Conductors

Band theory of solids, p and n type of semi-conductors. Statistics of hole and electrons, Hall effect. Effect of temperature of conductivity. Low temperature generation, Drift and diffusion, p n junction.

Dielectric Materials

Polarization. Types of polarization, Dielectric breakdown. Piezoelectriity, Ferroelectricity, Electrates, Ceramic

Magnetic Materials

Dia, Para, Ferro-magnetism, Antiferro, Ferri-ferro-magnetism, Ferrites

Superconductors

Type of Superconductors, Meissner effect, Jesephens effect, High temperature Superconductors, Future application.

B.E. (Computer Engineering) I Year II Semester
Practical Paper—; COE—116 Principles of Electrical Engineering

Based on course work of theory COE—111 Principles of Electrical Engineering

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B.E. (Computer Engineering) I year II Semester
Practical Paper—II COE—117 Applied Mechanics

Based on course work of theory

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B.E. (Computer Engineering) I Year II Semester
Practical paper—III COE—118 Introduction to Programming

Based on course work of theory COE—114 Introduction to Programming

B. E. (Computer Engineering) I Year II Semester
Practical Paper—IV COE—119 Physics of Materials

Based on course work of theory paper COE—115 Physics of Materials.

B.E. (Computer Engineering) I Year II Semester Sessional
Programming Non Examination

B. E. (Computer Engineering) II Year III Semester
Examination Theory Paper—I

COE—201 Electronics—I

(Same as EC-201)

Semiconductor Devices : PN Junctions characteristics. Zene and avalanche breakdown, Diode equation, Junction capacitance. Diode Applications as clipper, Clamper and comparator. Bipolar transistor. Transistor current components. Transistor characteristics in CB, CE and CC configuration. Ebers-Moll model of a transistor D.C. Load line and graphical Analysis of CE amplifier. Transistor D.C. load line and graphical Analysis of CE amplifier. Transistor as a awitch. Transistor ratings. Transistor hybrid parameters and equivalent circuits. Analysis of elementary transistor amplifier in CB, CE, CC configurations. Millers Theorem and its dual. Simple cascaded circuits Simplified equivalent circuits Transistor biasing and stabilizing.

Field Effect Devices. Junction field effect transistor, JEET volt-ampere characteristics, MOSFET, FET. Small signal model and parameters

Special Devices : Unijunction transistor, Zener diode. Thyristors - SCR firing and control circuits, diacs, triacs. LED, LCD. Photodiode. Solar cell, Phototransitor.

Power supplied : Half wave, Full wave and bridge rectifiers, Smoothing filters, Zener Regulator.

B.E. Computer Engineering) II Year III Semester
Examination Theory Paper II

COE— Circuits and Systems

(Same as for IC—202 and EC—202)

LTP
310

Introduction to continuous time and discrete time signals and systems. Basic continuous-time and discrete-time signals, unit step, ramp and impulse. Differential and difference equation for linear time invariant (LTI) continuous-time and discrete-time systems.

Review of Laplace transform (LT) properties and solution of differential equations using LT. Waveform Synthesis and LT of complex waveforms, concept of transform impedance. Network functions, Two-port parameters. Interconnections of 2-port network, Reciprocity, Network Theorems (Thevenin, Norton, Millman. Maximum power transfer), Block diagram Time-domain analysis of LTI networks using Laplace transform, Relation between impulse response and system function. Convolution integral, Concept of poles and zeros, Relation between location of poles, Time-response and stability.

Fourier Transform, basic theorems, application to LTI networks, frequency response. Fourier series representation of periodic non-sinusoidal signals. Application to analysis of LTI networks.

Introduction to graph theory and Z-transform

B.E. (Computer Engineering) II Year III Semester
Examination Theory Paper—IV

COE—204 Electrical Measurements

(Same as EC 204)

LTP
310

Units :

S.I system of units, dimensions and standards, errors in measurement.

Electrical Circuit Components :

Resistance, inductance, capacitance, measurement of low, medium, high resistance and use of different D.C. bridges, measurement of inductance and capacitance using different A.C. bridges D.C. and A.C. potentiometers and their application.

Indicating Instruments :

Construction and theory of D' Arsonval galvonometer and its use as moving coil ammeters volumeters, moving iron type ammeters and volumeters, dynamometer type wattmeter, induction type energy meter, vibration galvanometer, magnetic oscillographs.

Electronic Measurements :

Basic principles of vaccuum tube and transistors voltmeter, D.V.M., multimeters, electronic wattmeters, C.R.O. and its applications.

Measurement of Non Electrical Quantities :

Various types of transducers, measurement of displacement, speed, stress, strain.

B.E. (Computer Engineering) II Year III Semester
Theory Paper—V

COE—205 Mathematics—III

(Same as EC—205 and IC—205)

LTP

310

Vector Analysis : Triple products of vectors, differentiation of a vector. The operators grade, divergence and curl and their geometrical and physical significance, Integration of vectors, Work done in vector fields, Green's Stock's and Gauss divergence theorem.

Fourier Series : Fourier Series, Euler's formulae, Even and odd-functions, Functions having aroicrary periods, half range expansion, harmonic Analysis.

Special Functions : Beta and Gamma functions, Bessel functions of first, kind, Recurrence relations. Modified Bessel functions of first kind Ber and Bel functions, Legenure Polynomials. Rourigue's formulae. Orthogonal expansion of functions.

Functions of Complex Variable : Analysis functions, Harmonic conjugate. Conformal transformation of functions $az+d$, $z2$, $1/z$, ez, $(az+c)/(cz+d)$, Cauchy's integral theorem. Cauchy's integral formulae, Residue theorem, Evaluation of real integrals.

B.E. (Computer Engineering) II Year III Semester Practical Paper-I
COE 206 Electronics-I

Based on the course work corresponding to COE—201 Electronics—I

LTP

002

B.E. (Computer Engineering) II Year III Semester Practical Paper II
COE—207 Power Apparatus

Based on the course work corresponding to COE—203 Power Apparatus

LTP

002

B.E. (Computer Engineering) II Yar III Semester Practical Paper-III
COE—208 Electrical Measurements

Based on course work corresponding to COE—204 Electrical Measurement

LTP

002

B.E. (Computer Engineering) II Year III Semester Practical paper-IV
COE—209 Machine Drawing)

Introduction

Conventional representation of common features as and materials as per I.S.I. 696-1972, various rolled sections and their uses.

Screw Thread.

Projections and forms of screw threads and their conventional representation as per I.S.I. 629-1972.

Free hand sketching and scale Drawings, component like pipe fitting and joints, turn bucale, shaft couplings, bolts, nuts and Keys, bush bearing and ball bearings.

B.E. (Computer Engineering) II Year III Semester Sessional
Paper I COE—210 Programming-I

Computer Languages : Basic concepts of FORTRAN language. Arithmetic expressions. Simple input and output statement, Flow charts. Loop instructions, Format statements. I, F, E, X, H, T, Field specifications. Transfer of control Statement-GO TO, Arithmetic IF, Logical IF, DO statement, The statement function, Function subprogram, Subroutine Subprogramm, Common and Equivalence statements, Logical operations.

B.E. (Computer Engineering) II Year IV Semester Examination Theory
Paper-I
COE—211 Electronics—II
(Same as for EC—211 and IC—211)

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Amplifier Fundamentals : Dynamic transfer characteristic, decibel notation, distortion in amplifiers, comparison of bipolar transistor, For amplifier, classification of amplifiers, noise in amplifiers, noise figure.

Small Signal Amplifier : High frequency effects and hybrid pie model, frequency parameter of R C coupled amplifier using bipolar transistor. FET and gain bandwidth product, multistage amplifiers, emitter follower at low frequency and high frequency, Darlington connection, source follower, cascode amplifier.

Power Amplifier : Single ended and pushopull amplifiers, class B power amplifiers, conversion efficiency, power considerations and heat sinks.

Feedback Amplifiers and Oscillators : Principles of feed back in amplifiers, advantages of negative feedback effect of feedback on impedance, Nyquist criterion for stability, Barkinausen criterion for sinusoidal oscillators, phase shift oscillator. Weinbriadge oscillator, crystal oscillators, frequency stability.

Transistorised Regulators (Series Regulator), IC Fabrication

B.E. (Computer Engineering) II Year IV Semester Examination Theory
Paper-II
COE—212 Electromagnetics
(Same as EC—212)

LTP

310

Mathematical Orientation :

Review of gradient, curl and divergence operations, volume, surface and line integrals. Vector identities, coordinate system and transformation of vectors in various coordinate systems, Dirac delta function.

Static Electric Fields :

Columb force, field due to number of charge, charge density functions, Dirac delta representation of charges, field due to various sources, scalar potential method of evaluating fields, fields in dilectricals, polarization, D AND P Vectors, electric dipole and moments concept of á simple medium, boundary conditions, capacitors, energy stored in electric fields, solution of Laplace equation of various coordinate systems by separation of variables, field mapping and conformal transformation, statement and interpretation of Maxwell's equations.

Steady Magnetic Fields :

Lorentz force equation, concepts of magnetic intensity and magnetic field, Biot-Savart Law, Magnetic vector potential, force and torque between the current carrying conductors, loops, solenoid, magnetic material, magnetic dipole in vector calculation of inductance for simple geometries, energy stored in a magnetic fields, solution of magnetic static problems by separation of variables field mapping and conformal transformation, magnetic circuits, statement and intepretation of maxwell's equations.

Time Dependent Fields :

Generalization of Maxwell's equations in source free medium, plane waves and wave reflections at conductor and dielectric interfaces, wave propagation in conducting and dielectric media, concept of surface impendance and skin effect.

B.E. (Computer Engineering) II Year IV Semester Examination Theory
Paper-II
COE—213 Date Structures

LTP
310

Arraya stacks, queues :—their fundamentals and applications

Linked Lists.

Singly linked list, linked stacks and queues, doubly linked lists, representation of sparse matrix, dynamic memory management.

Trees,

Basic concepts, Binary trees (Representation, traversals etc . application of trees structures, symbol tables).

Graphs

Terminology and representations, trversals, etc. application of trees. path algorithus.

Searching, sorting and merging algorithms and their analysis

B.E. (Computer Engineering) II Year IV Semester Examination Theory
Paper-I
COE—214 Digital Circuits & Systems I
(Same as EC—214)

LTP
310

Introduction to logic families RTL, TTL, ECL, IIL, types of MOS etc IOGIC gates Boolean algebra, Combinatorial Logic, Karnaugh Map Techniques, Q.M. Techniques Combinatorial Logic, Binary number representation, Binary arithmatic, Binary Codes, Half adder, Full adder (Transistorised Bistable, Astable, Monostable Multivibrators, Schmitt trigger), Flip-Flops, Latch, Clocked Flip-Flop, TTL Clock generator, Monostable, multivibrator and Astable multivibrator. Introduction to Counters Ripple Counters, Synchronous counters, Programmed counters Design of Counters, decoders, multiplexers PLAS and code converters

Digital to analog conversion, Analog to Digital Conversion, Voltage to frequency conversion, Frequency to voltage conversion, Design of Display systems.

Semiconductor Memories, PLAS

B.E. (Computer Engineering) II Year IV Semester Examination Theory Paper-V.
COE—215 Principles of Communication Engineering

Elements of communication systems, Signals, noise linear modulation, exponential modulation, Sampling, and pulse modulation, digital modulation (ASK, PSK, FSK) (PAM PDM, PPM, PCM, PDM), demodulation for various modulation systems, SNR for various modulation systems.

Transmission lines :

Transmission line equation, characteristic impedance, propagation constant, attenuation and delay distoration, return loss, loading of cables, standing wave ratio, transient analysis, matching single and double stub, use of Smith chart quarter wave transformer-single and double section, U.H.F. lines as circuit elements.

B.E. (Computer Engineering) II Year IV Semester
Practical Paper-I COE—216 Electronics-II

Based on course work of theory paper COE—211 Electronics—II

LTP

002

B.E. (Computer Engineering) II Year IV Semester
Practical Paper—II COE—217 Digital Circuits & System I

Based on course work of theory paper COE—214 Digital Circuits & System I

LTP

002

B.E. (Computer Engineering) II Year IV Semester
Practical Paper—III COE—21 Principles of Comm. Engg.

Based on course work of theory paper COE—215 Principles of Comm. Engg.

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B.E. (Computer Engineering) II Year IV Semester
Practical Paper-IV COE—219 Electrical Workshop and Electrical Drawing

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Electrical Wiring : Types of electrical wiring for industrial and domestic installation, their comparative features, material employed, exercises in following type of domestic writing — conduit clear, casing capping and TRS on batters, exercises in hospital, godown and Staircase wiring resting of installation according to Indian Electricity rules

Winding of Electrical Machines : Materials employed for winding of electrical machines, enamelled wires, cotton covered and silk covered wires, bar conductors, simple lap and wave winding, for d c machines, single layer and double layer A.C. winding, fault location in windings and d.c. armature testing of electrical machines according to ISI standards

Electrical Circuit Drawing : Study of ISI abbreviations and symbols for electrical equipment in electrical drawings, lay out and circuit diagram for domestic, industrial lighting and power schemes, energy meter connections, circuit diagrams for different a.c. and d.c. starters, layout of a typical distribution substation.

Electrical Machines : Detailed dimensioned drawings from sketches of components of rotating electrical machines, such as armature, commutator, field magnet frame, poles and shoes etc., details of transformers, transmission line pole, crossarm, and insulators.

B.E. (Computer Engineering) II Year IV Semester
Practical Trainign Paper —V COE—220

B.E. (Computer Engineering) II Year IV Semester
Sessional

Paper-I COE-221 Report Writing

Paper-II COE-222 Programming II Year (Numerical Methods)

Writing of programs to compute simples, problems like evaluation of function, summation of series, solution of equations by Newton-Raphson method, calculation of statistical characteristics, evaluation of definite integrals.

Simple operations on matrices, solutions of ordinary differential equations etc.

Numerical solution of differential equations, Introduction to finite differences and difference equation.

B.E. (Computer Engineering) III Year V Semester
Examination Theory Paper—VI

COE-301 Principles of Computer Graphics

Introduction to Interactive Graphics, Graph plotting, Windows and Clipping, Segmentation, Viewports, interactive programming, Planning and Zooming.

General overview of Graphics Hardware.

Implementation of a Simple Graphics Package (SGP).

2D transformations, Homogeneous coordinates and Matrix representation of 2D transformation, Composition of 2 D transformation, Matrix representation of 3D transformation composition of 3D transformation.

Projections—Parallel and perspective, mathematics of Planner Geometric Projections, Image Transformation.

Raster Algorithums and Software for scan converting lines, characters circles, Region filling, Polygone clipping, Riding surfaces, Representation of 3D Shapes, Polygon meshes, Parametric cubic curves, Parametric cubic surfaces, B-Spline and Bezeir Curves.

B.E. (Computer Engineering III Year V Semester Examination Theory III COE—303 Computer System Organization

(Same as EC—303)

LTP
310

Basic concepts of structure of Computers, Addressing methods, Machine program sequencing, Memory locations, Addresses and encoding of information, instruction, formats, Instruction sequencing Execution of a complete instruction, (8085) Address modes, Push down stacks, Subroutines, Instruction set of a typical processor (8085) Instruction set in a large computer, Stack computers, Sequencing of control signals, Microprogrammed control, Input/output organization, addressing I/O devices, I/O programming, Data transfer, Synchronization, Interrupt handling, I/O channels.

Microprogramming :

Basic notion, Implementation stratagies, Case study and high level language implementation.

Introduction to Assembler, Linker, Loader.

B.E. (Computer Engineering) III Year V Semester Examination Theory Paper—IV

COE-304 Linear Integrated Circuits

(Same as EC-304)

LTP
310

IC Op-AMP application : basic building blocks using OPAMPS, inverting/noninverting VCVS, integrators, differentiaters, CCVS and VCCS, active filters and oscillators.

Logarithmic amplifiers, Log/Antilog modules, precision rectifier, peak detector, sample and hold circuits.

OP-AMP As comparator, Schmitt fridger, square and triangular wave generator monostable multivibrator.

IC Analog multiplier applications : use of multiplier as analog divider, modulator, phase angle measurement, tone burst generator, voltage-tunned amplifiers and quadrature Oscillator.

IC OTA applications : Basic building blocks using OTA, electronically programmable functional circuit examples.

Voltage regulators : OPO-AMP regulators, IC regulators (723 and its various modes of operation)

IC Timer applications : monostable and astable operation.

Phase lock loop applications : IC Power amplifiers.

Applications of analog switches, Programmable gain amplifiers.

B.E. (Computer Engineering) III Year V Semester Examination Theory Paper—V

COE—305 Industrial Organisation and Managerial Economics

(Same as EC—305 and IC—305)

LTP

310

Principles of Management :

General ideas on the art and science of management, various functions, definitions and scope of engineering.

Organisational Structure :

Various types, merits & demerits.

Plant Location and Layout :

Sequence of planning and control of production, scheduling, Routing, Despatching.

Methods Study :

Methods analysis, Various charts associated with methods analysis, Time study methods of rating.

General idea of personnel management, Industrial psychology, Evaluation and monitoring.

Business decision making and forward planning, Demand and forecasting-cost production analysis-prices and pricing decisions, Profits and Capital Management.

Analysis of inter industry relations macro-economics (with special reference to India)

B.E. (Computer Engineering) III Year V Semester Practical Paper-I
COE 306 Computer Systems Organization.

Based on course work of theory paper COE—303 Computer systems Organisation

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B.E. (Computer Engineering) III Year V Semester Practical Paper-II
COE—307 Linear Integrated Circuits

Based on course work of theory paper COE—304 Linear Integrated Circuits.

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B.E. (Computer Engineering) III Year V Semester Practical Paper-III
COE—308 Principles of Computer Graphics.

Based on course work of theory paper COE-301 Principles of Computer Graphics

L T P
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B.E. (Computer Engineering) III Year V Semester Sessional
Paper-I COE—309 Programming III ("C" Language)

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Data types, Structures and unions, Control structures, Input-output statements, Functions and procedures, Applications to structured programming, Concept of pointers.

Practical training in Electrical/Electronics workshop for 3 weeks after the Fifth Semester (Assessed under Sixth Semester Examination COE 320)

B.E. (Computer Engineering) III Year VI Semester Examination Theory
paper—I COE—311 Microprocessors
(Same as EC—311)

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Review of popular 8 bit microprocessors, study of peripheral support chips like DMAC, programmable interrupt controller, USART, peripheral interface chips, CRT Controller etc.

Comparison with other popular bit microprocessor chips.

Introduction to popular 16 bit microprocessors architecture, addressing modes, instruction set, interfacting techniques, support chips. Introduction set, interfacting techniques, support chips. Introduction to popular 32 bit microprocessors chips.

B.E. (Computer Engineering) III Year VI Semester Examination Theory Paper-II COE—312 Information System and Data Management

LTP

310

Data Processing Concepts and File Systems :

Definitions, Auxiliary storage devices and its parameters, File types organisation and access methods, Sequential, Indexed-Sequential, Direct Ring, Tree structured.

Structured Programming :

Programming structure, Structured flow chart, Structured programming logic.

Management Information System :

Introduction, Elements of MIS, Structure of MIS.

Data Base Concepts :

Data management-file system approach and data base approach, Design of Data base model, Quarry system, Security, Privacy, Integrity considerations.

B.E. (Computer Engineering) III Year VI Semester Examination Theory Paper III.

COE—313 Operating Systems

LTP

310

Introduction to operating system, Operating System Services, File Systems, CPU Scheduling Resource Management.

Introduction to Distributed Operating system, Virtual Memory, Disk and Drum Scheduling, Deadlock, Concurrent Processor, Concurrent

programming, Case Studies : CP/M, DOS, Unix, Others.

Design of an interactive System

B.E. (Computer Engineering) III Year VI Semester Examination Theory Paper—IV

COE—314 Control Engineering

(Same as EC—314)

Mathematical Model :

Transfer function concept, derivation of transfer function of physical System, concept of feedback and its effect on the performance of a system, block diagram reduction, signal flow graphs.

Transient Response Analysis :

Standard inputs, response of first and second order system, proportional derivative and integral control, static and dynamic error coefficient.

Root Locus Techniques :

Root locus plot, experimental determination of transfer functions, polar plot, experimental log magnitude v/s phase plot, M-Noci, Nichol's chart, design of compensating networks.

Stability :

Concept of Stability, Routh-Hurwitz, stability criterion Nyquist stability criterion, Relative stability analysis.

Control Components :

Synchronous d.c. motors, tacho generations, gyroscope, amplifiers, magnetic amplifers.

B.E. (Computer Engineering) III Year VI Semester Examination theory paper—COE—315 Advance Computer Architecture.

LTP
310

Stock Computers ;

Basic notion of stack machines, Stacks in arthmetic evaluation, Stacks for subroutine calls, Stacks for data allocation and evaluation of stack machines.

Parallel Computers :

Basic structure of parallel computer, Horizontal and vertical parallelism, Array computers, Parallel processing Languages (e.g. OCCAM).

Structure, Instruction repertoire, Storage structure, Interconnectors, Vector Algorithms and evaluation.

Multiprocessors : (Review)

Structure, Instruction repertoire, Synchronization, Algorithms and evaluation.

Microprogramming : (Review)

Pipeline Computers :

Basic ideas, Pipeline implementations, Artithmetic memory access, Control unit, Evaluation of pipeline computers and case studies.

Queing models, M/M/1 systems, Multiqueue systems, Other performance techniques, Simulation.

B.E. (Computer Engineering) III Year VI Semester Practical paper—I Coe—316 Microprocessors.

Based on course work of theory paper COE—311 Microprocessor:

LTP

002

B.E. (Computer Engineering) III Year VI Semester Practical Paper—II COE—317 Information system and data Management lab.

Bases on course work of theory paper COE—312 Information systems and Datamanagement

LTP

002

B.E. (Computer Engineering) III Year VI Semester Practical Paper-III COE—318 Control Engineering

Based on course work of theory paper COE—314 Control Engineering.

LTP

002

B.E. (Computer Engineering) III Year VI Semester Sessional

Paper—I COE—319 Programming IV (Prolog/Lisp)

LTP

003

Basic of programming in prolog sections, control structure, files, lists, recursion, knowledge Bases case studies.

Paper—II COE—320 Practical Training

LTP

000

Practical training in industry for 8 weeks after the Sixth Semester (Assessed under the Seventh Semester examination COE—409)

B.E. (Computer Engineering) IV Year VII Semester Examination Theory Paper—I

COE—401 Compiler and Translator Design.

LTP

310

Introduction to translators, Assemblers and Related programms, Two Pass Assemblers, One pass Assemblers, Program Modules, Microprocessor.

Compilers : Syntactic Analysis, Lexical Analysis, Symbol Table management, Intermediate code representation, Semantic procession, Target code generation, Code optimization, Error handling, Loading.

Relocation. Resolution of external reference, Library management. Storage allocation, Absolute loader, Relocating loader, Transfer Vector.

Linker, Linking, loading, Static overloading generator, Dynamic linker.

B.E. (Computer Engineering) IV Year VII Semester Examination Theory Paper—:I

COE—402 Digital Circuits & Systems II

(Same as EC—402)

LTP
310

Review of Sequential circuits, State Tables, and State diagrams, State assignment, Designing digital systems with state diagrams, Designing of digital circuits with the help of a Hardware programming Language, Variable machine cycle and fixed cycle length machine, Design of an 8 bit Processor, Introduction to Design of a Computer.

Introduction to PAL devices.

B.E. (Computer Engineering) IV Year VII Semester Examination Theory Paper—III

COE—403 Microprocessor Applications

LTP
310

Review of Microprocessors, Arthmetic co-procesors, Various Bus Standards, Precautions about shielding Grounding etc. Bus Interconnections, Memory System Design, DMA Controller, Design of Serial and parallel Interfaces.

Design of Input-Output (Tape, CRT, Printer, Keyboard and Disk) controller interfaces.

Interfacing DAC, ADC and stepper motor.

Writing a Monitor Program.

Introduction to Bit Slice Processor, Signal Processing Processors/ Transporters.

Introduction to Development Tools : MDS, Logic Analyser

B.E. (Computer Engineering) IV Year VII Semester
COE—404 and COE—405 Elective (i)

Signal Processing I

LTP

310

Introduction to Anlog Signal Processing :

Approximation problems, LC Ladder Filters and RC active filters, Concepts of Sensitivity.

Introduction to Digital Signal Processing.

Z-Transforms, Stability analysis in Z plane, Convolution.

Digital Filter Structures, IIR and FIR Filters, Finite word length problems, DFT and FFT.

B.E. (Computer Engineering) IV Year VII Semester
Examination Theory Paper—IV & V

COE—404 and COE—405 Elective (ii)

Bio Medical Electronics

Basic Neurology, Activity of one years, Neuromuscular system, Electrical activities of the brain, Electrical activities of the visual system, Auditory system mechanism, Noise and interference in biological signals, Computer applications.

B.E. (Computer Engineering) IV Year VII Semester
Examination Theory Paper—IV & V

COE—404 and COE—405 Elective (ii)

Computer Aided Design

LTP

310

Introduction to CAD : Introduction to interactive computing and use of graphics. Requirements of interactive computing, dedicated Vs time-sharing modes, Interactive interface, CRT ava display device. Graphical quality, capacity, speed of modification, Ease of programming. Line drawing, Solid-area graphics packages 9GINOF. GINOM and others), Use of interactive input tools such as light pen, cursor, Geometry of plotting in two dimensions, Scaling.

Computer-Aided Circuit Design : Topological structures, Computer methods of linear and non-linear network analysis, Sensitivity models for computer-aided design, Optimization methods in circuit design, Computer-aided design of filters, printed and integrated circuits, Computer-aided probabilities network sysnthesis.

Introduction to computer-aided design of control systems.

B.E. (Computer Engineering) IV Year VII Semester
Examination Theory Papers—IV and V

COE—404 and COE—405 Elective (iv)

Theory of Automata and Formal Language

L.T P

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Rewriting Systems, Grammars and automata. Deciding, Accepting and generating, Regular languages and finite-state automata, Context—fee Language Push—down automata and tree automata context-sensitive language, Recursive sets and tuning machine. Formal language in theoretical biology, Developmental languages, Tesselation automata.

B.E. (Computer Engineering) IV Year VII Semester
Examination Theory Paper—IV & V

COE—405 Elective(v) Artificial Intelligence.

LT P

3 1 0

1. Introduction : History, What is AI, Issues-Intellectual.

2. Problem Solving : Problem space, State Space, Heuristic search.

3. Search Methods : Hill climbing, Depth., Fi· · Breadth First, Best first, Exploiting constraints, Dependency, directed back tracking, Means-ends analysis, Mini-Max. Alpha-Beta.

4. Planning : Strips, Build, Abstrips.

5. Knowledge Representation : Logic and resolution, Default, reasoning, Semantic nets, Parallel implementation of Semiric nets, Frames.

6. Natural Language : Semantic grammes, Conceptual dependency, Scripts.

7. Production Systems : Varieties of Production Systems, use as phychological models, use in expert Systems.

   Learning : Learning concepts and laws from examples, Learning when to apply productions, Learning new

productions from old, Discovering new concepts, Learning in parallel networks.

8. The Future of AI : Application areas, Moral issues, Relation to human cognition.

B.E. (Computer Engineering) IV Year VII Semester
Examination Theory Paper—IV & V

COE—404 and COE—405 Elective (vi)

Simulation and Modelling

LTP

310

System and Models : Discrete and continuous simulation, programming consideration and languages—GPSS, SIMSCRIPT II and SIMULA—random number generation, testing of random number, stochastic varibles generation, output analysis control of length of simulation—verification and validation of simulation, Some examples

B.E. (Computer Engineering) IV Year VII Semester
Practical Paper—I

COE—406 Compiler Translator and Design

Based on course work of theory paper COE—401 Compiler Translator and Design

LTP

002

B.E. (Computer Engineering) IV Year VII Semester
Practical Paper—II COE—407 Digital Circuits & Systems II

Based on course work of theory paper COE—402 Digital Circuits & Systems—II

LTP

002

B.E. (Computer Engineering) IV Year VII Semester
Practical Paper—III COE—408 Electives—I & II

Based on course work of theory paper COE—404 & COE—405

LTP

B.E. (Computer Engineering) IV Year VII Semester
Paper—IV COE—409 Practical Training undergone at the end of Sixth
Semester

B.E. (Computer Engineering) IV Year VII Semester
Sessional

Paper—I COE—410 Systems Programming Language

Programming exercises using BIOS calls with emphasis on file structure, Disk Management, Peripheral controller, etc.

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Practical training in industry for 8 weeks after the Seventh Semester examination (Assessed in Eighth Semester examination under COE-416)

B.E. (Computer Engineering) IV Year VIII Semester
Examination Theory Paper—I

COE—411 Computer Communication and Electronic Switching

L T P

3 1 0

Review of Digital modulation systems, Bandwidth compression. Digital multiplexing, MODEM, Overview of Transmission media, Data Transmission, Channel capacity Introduction to telephone exchange systems, Telecommunication traffic, Circuit switching, Message switching and Packet switching, Protocol structures in Networks, Network interface X-25 standard, Routing in Packet networks, Resource sharing and Multiple access techniques, A Satellite Based ALOHA Technique, Terrestrial Packet Radio system, Data Networking, Packet switching and common carriers Value Aided Networks, Combining Circuit and Packet switching.

B.E. (Computer Engineering) IV Year VIII Semester
Examination Theory Paper—II and —III

COE—412 and COE—413 Elective (i)

Optimization Methods

Optimization problems, Search techniques and gradient methods for unconstrained optimization, Linear and integer programming, Kunu-Tucker conditions, Direct and transformation methods for non-linear programming multiobjective programming, Dynamic programming, Applications.

B.E. (Computer Engineering) IV Year VIII Semester
Examination Theory Paper—II and III

COE—412 and COE—413 Elective (ii)

Signal Processing—II

LTP

310

1. STOCHASTIC PROCESS :—Definition and characterization, first and second-order statistics, Moments and stationarity, Frequency Domain Representation, Discreate time Random processes, Filtering of Discreate-time Random signals. Definition of AR, MA & ARMA process.

2. SPECIAL ESTIMATION ALGORITHMS :— Non parametric and parametril spectral Estimation Techniques, Periodogram, Burg's Algorithm, Yle-Walker Equation, Levinson-Algorithm, Durbin Adaptive signal processing : Widraw's LMS algorithm, Recursive least squares ladder algorithm for AR modeling.

3. SPEECH SIGNAL ANALYSIS :— Introduction to Acoustic theory of speech production, Digital model of speech production, time domain Analysis, short-time Fourier Analysis, linear predictic Analysis, Homomorplde Analysis.

4. Introduction to 2-Dimensional signal processing.

B.E. (Computer Engineering) IV Year VIII Semester
Examination Theory Paper—II and III

COE—412 and COE—413 Elective (iii)

Fault Tolerant Computing

LTP

310

1. Basic concepts of Reliability : Reliability and the failure rate, MTBF, Maintainability, Availability, Series and Parallel systems.

2. Faults in digital circuits : Modelling of faults, stuck-at-faults, Bridging faults etc.

3. Test Generation for combinational logic circuits : Path sensitization technique, D-Algorithm, Boolean Difference, PODEM,

   Multiple fault detection.

4. Test Generation for sequential circuits : State identification experiments, Machine identification, Checking experiments, Augmented sequential machine and easily testable machines and fault diagnosis.

5. Fault-Tolerant Design of Digital Systems : Basic concepts, Triple Modular Redundancy, Use of error correcting codes, Faults-Tolerant electronic telephone exchanges and computers.

6. Basic concepts of Random testing, Transition count testing, Signature analysis, Self-Checking and fail-safe logic.

7. Fault detection in RAM and microprocessor.

   Design for Testability : Controllability and Observability, Introductory concepts of Reed-Muller expansion technique, Level sensitive S an Design (LSSD) and Built-in Digital Circuit observer (BIDCO).

B.E. (Computer Engineering) IV Year Semester
Examination Theory Papers—II & III

COE—412 and COE-413 elective (iv)

Introduction of VLSI Design

LTP

310

Evolution of VLSI, MOS Devices and circuits, MOS Transistors— Depletion and enhancement mode transistors, Transistors as a switch, NMOS inverter, Inverter delay, Parasitic effects, Pull-up/pull-down ratios for inverting logic, Basic NAND, NOR, XOR and XNOR gates, Multiplexers, Memory, Pass transistors,, Super buffers, nMos combinational Network which pass transistors and inverters, PLAS, Clocked logic, Two-phase

clock, Register stage, Introduction to CMOS gates.

Processing technology, Explanation of different stages in fabrication.

Design Methodology, Steps in the Design of a VLSI part, VLSI design tools.

B. E. (Computer Engineering) IV Year VIII Semsester
Examination Theory Papers II and III

COE—412 and COE—413 Elective (V)

Data Base Management System

LTP

310

Data Processing and Data Base System, Data models and their characteristics, Theory of Relations, Data Languages, DBMS implementation and physical data organization, DBMS operational requirements, Performance, coacurrency, Integrity, Security, Privacy, Data base machines, Distributed Data base systems.

Database Management Systems : IMS, TOTAL, ADBAS, IDMS, CODASYL, RELATIONAL, HIERARCHICAL and Network, Data Base Systems, Implementation of IDMS Based Data base Exercise.

B. E. (Computer Engineering) IV Year VIII Semester
Examination Theory paper II and III

COE—412 AND COE—413 Elective (vi)

Distributed computer control system (DCCS) architectures, (A) centralized control of geographical distributed systems, (B) Control computation system using distributed processors concerned in a network, advantages, Cost and reliabilíty aspects of DSCCS.

Decomposition of type (A) systems : Techniques of singular perturbation and aggregation, Optiminiation by decoupling and coordination, Data Aquisition monitoring and control of type (B) systems using distributed processors, Task assignment techniques. Intertask communication, primitive and related software structures.

Case studies of type A and type B distributed systems from process control applications.

B.E. (Computer Engineering) IV Year VIII Semester
Examination Theory Papers—II & III

COE—412 and COE—413 Elective (vii)

Engineering Methodology for Software Production

Introduction to software Blueprint methodology, software elements, Software modules, Software Architecture, Software Design, Design of a Lexical Scanner, Design of an interactive Text Editor, File System, I/O system, An output Spooling System and a Multiprogramming System, Software Design Language.

B.E. (Computer Engineering) IV Year VIII Semester
Examination Theory Paper—II & III

COE—412 and 413 Elective (viii)

Software Engineering

LTP

310

Survey of software Lifecycle Models, Transform Theory of Software Performance, A network model of structured Programs, Theory of Software Verification, Application to searching, Application to File structures, Application to sorting, Theory of Process, Application to Concurrent Programmms, Object-Based Software Design, The Duality Principle, Analysis of System Dead Lock, Software Fault-Tolerance.

B.E. (Computer Engineering) IV Year VIII Semester
Examination Theory Papers—II and III

COE 412 and COE—413 Elective (ix)

Robotics

LTP

310

1. Basic concepts of mechanism.

2 Kinematics of manipulators, rotation, translations and

transformation.

3. D-H representation.

4. Direct and inverse Kinematics.

5. Differential translation and transformation, Jocobian.

6. Robotic motion tranjectory design.

7. Modelling using bonographs, Newton Eular equations and Lagrange-Euler equation. Example.

8. Motion control—open and closed loop, control of industrial robots.

9. Force control.

10. Sensor and vision systems

11. Advanced topic—real time control, networking of robots

B.E. (Computer Engineering) IV Year VIII Semester
Examination Theory paper—II and III

COE—412 and COE—413 Elective (x)

Expert Systems

LTP

310

Production Systems, search strategies, Predicate calculus and resolution, rule-based deduction systems, semantic networks, frames, and scripts. AI system architectures.

Knowledge aquisition Case studies.

B.E. (Computer Engineering) IV Year VIII Semester
Practical Paper—I COE—414 Elective III & IV

Based on course work of theory papers (COE—412 & COE—413 Electives III & IV).

LTP

002

B.E. Computer Engineering) IV Year VIII Semester
Practical Paper—I COE—415 Project

B.E. (Computer Engineering) IV Year VIII Semester
Practical Paper—III COE—416 Practical Training

B.E. (Computer Engineering) IV Year VIII Semester
Sessional

Paper—I COE—417 Seminar/Report