ACADEMIC REGULATIONS
COURSE STRUCTURE
AND
DETAILED SYLLABUS

ELECTRONICS & CONTROL ENGINEERING

For

B.TECH FOUR YEAR DEGREE COURSE

(Applicable for the batches admitted from 2002-2003)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY

KUKATPALLY, HYDERABAD - 500 072.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY,
HYDERABAD

B. Tech. (Regular) Four Year Degree Course (Revised) Academic Regulations

(Effective for the students studying I year
from the Academic Year 2002-2003 and onwards)

1. Award of B.Tech. Degree:

A student will be declared eligible for the award of the B. Tech. Degree if he fulfills the following academic regulations:

i. He has pursued a course of study for not less than four academic years and not more than eight academic years.

ii. He has registered for and studied all the subjects for a total of 212 credits and secured all the 212 credits.

2. Students, who fail to fulfill all the academic requirements for the award of the degree within eight academic years from the year of their admission, shall forfeit their seat in the course and their seat shall stand cancelled.

3. Courses of study:

The following courses of study are offered at present for specialization for the B. Tech. Degree:

1. Aeronautical Engineering
2. Bio-Medical Engineering
3. Bio-Technology
4. Chemical Engineering
5. Civil Engineering
6. Computer Science and Engineering
7. Computer Science and Systems Engineering

8. Electrical and Electronics Engineering
9. Electronics and Commur ication Engineering
10. Electronics and Compute Engineering
11. Electronics and Control Engineering
12. Electronics and Instrumentation Engineering
13. Electronics and Telematics Engineering
14. Information Technology
15. Instrumentation and Control Engineering
16. Mechanical (Mechatronics) Engineering
17. Mechanical (Production) Engineering
18. Mechanical Engineering
19. Metallurgical Engineering
20. Metallurgy and Material Technology

and any other course as approved by the authorities of the University from time to time.

4. Credits:

	Semester Pattern		Yearly Pattern	
	Periods / Week	Credits	Periods / Week	Credits
Theory	04	04	03	06
Practicals	03	02	03	04
Practicals	06	04	06	08
Project	08	08	—	—

5. Distribution and Weightage of Marks:

i. The performance of a student in each semester / I year shall be evaluated subject –wise with a maximum of 100 marks for theory and 75 marks for practical subject. In addition, project shall be evaluated for 200 marks.

ii. For theory subjects the distribution shall be 20 marks for Internal Evaluation and 80 marks for the End-Examination.

iii. For theory subjects, there shall be 5 objective type tests for a duration of 20 minutes each during the semester. Each test shall contain 20 objective type questions for 20 marks. The best 4 tests will be considered for awarding 20 sessionals marks. For the I year class which shall be on yearly basis, there shall be 6 tests of the same duration and weightage as mentioned above. However, the performance in the best 4 tests will be considered for awarding 20 sessional marks.

iv. For practical subjects there shall be a continuous evaluation during the semester for 25 sessional marks and 50 End Examination marks. Of the 25 marks for internal, 15 marks shall be awarded for day-to-day work and 10 marks to be awarded by conducting Internal Lab Test(s). The End Examination shall be conducted by the teacher concerned and another member of the staff of the same department of the same institution.

v. For the subject having design and / or drawing, and estimation, the distribution shall be 20 marks for internal evaluation (10 marks for day-to-day work and 10 marks for internal tests). There shall be two internal tests in a Semester and the better of the two will be taken into consideration. However in the I year class, there shall be three tests and the best two will be taken into consideration for a maximum of 20 marks. The End Examination shall be for a total of 80 marks.

vi. The Engineering Drawing Practice Course wherever offered is to be treated as a practical course. Evaluation method adopted for practicals shall be followed here also.

vii. Out of a total of 200 marks for the project work, 40 marks shall be for Internal Evaluation and 160 marks for the End Semester Examination. The End Semester Examination (viva-voce) shall be conducted by a board of examiners consisting of Guide, Head of the Department and an external examiner. The evaluation of project work shall be conducted at the end of the IV year. The Internal Evaluation shall be on the basis of two seminars given by each student on the topic of his project.

viii. Laboratory marks and the sessional marks awarded by the College are not final. They are subject to scrutiny and scaling by the University wherever felt desirable. The uniform distribution of awarding of Sessional marks and Laboratory marks will be referred to a Committee. The Committee will arrive at a scaling factor and

the marks will be scaled as per the scaling factor. The recommendations of the Committee are final and binding. The laboratory records and internal test papers shall be preserved in the respective departments as per the University norms and shall be produced to the Committees of the University as and when they visit the College.

6. **Attendance:**

i. A student has to put in a minimum of 75% of attendance in aggregate of all the subjects for acquiring credits in the I year and / or each semester thereafter.

ii. Condonation of shortage of attendance in aggregate upto 10% (65% and above and below 75%) in each semester or I year may be granted by the College Academic Committee.

iii. A student will not be promoted to the next semester unless he satisfies the attendance requirement of the present semester / I year.

iv. Shortage of Attendance below 65% in aggregate shall in no case be condoned.

v. Students whose shortage of attendance is not condoned in any semester / I year are not eligible to take their end examination of that class and their registration shall stand cancelled. They may seek re-admission for that semester / I year when offered next.

vi. Condonation of shortage of attendance as stipulated in 6 (ii) above shall be granted on genuine and valid grounds with supporting evidence.

vii. A stipulated fee shall be payable towards condonation of shortage of attendance.

7. **Minimum Academic Requirements:**

The following academic requirements have to be satisfied in addition to the attendance requirements mentioned in item no. 6.

i. A student shall be deemed to have satisfied the minimum academic requirements and earned the credits allotted to each theory or practical design or drawing subject or project if he secures not less than 35% of marks in the end examination and a minimum of 40% of marks in the sum total of the internal evaluation and end examination taken together.

ii. A student shall successfully complete all the I year subjects from 3 regular consecutive examinations and 3 supplementary consecutive examinations of I year from the date of admission. If he has failed to do so he shall forfeit the seat in course and his seat shall stand cancelled.

iii. A student shall be promoted from II to III year only if he fulfils the academic requirement of 56 credits from the consecutive regular and supplementary examinations of I year and from the regular examination of II year I semester irrespective of whether the candidate takes the examination or not.

iv. A student shall be promoted from third year to fourth year only if he passes all the subjects of I year and fulfils the academic requirements of total 100 credits (including 56 credits of I year) from the examinations,

a. Two regular and Two supplementary examinations of I year.

b. Two regular and one supplementary examinations of II Year I Semester

c. One regular and one supplementary examinations of II Year II Semester

d. One regular III year I Semester examination.

v. A student shall earn all the 212 credits offered as indicated in the course structure.

vi. Students who fail to earn all the 212 credits offered as indicated in the course structure within eight academic years from the year of their admission shall forfeit their seat in the course and their seat shall stand cancelled.

8. **Withholding of Results:**

The result of a student shall be withheld if:

i. He has not cleared any dues to the Institution / Hostel;

ii. A case of disciplinary action against him is pending disposal;

9. **Course pattern:**

i. The entire course of study is of four academic years. The first year shall be on yearly pattern and the second, third and fourth years on semester pattern.

ii. A student eligible to appear for the end examination in a subject, but absent at it or has failed in the end examination may appear for that subject at the supplementary examination.

10. Award of Class:

After a student has satisfied the requirements prescribed for the completion of the programme and is eligible for the award of B. Tech. Degree he shall be placed in one of the following four classes:

First Class with Distinction	70% and above	From the aggregate marks secured for 212 Credits.
First Class	Below 70% but not less than 60%	
Second Class	Below 60% but not less than 50%	
Pass Class	Below 50% but not less than 40%	

(The marks in internal evaluation and end examination shall be shown separately in the marks memorandum)

11. Minimum Instruction Days:

The minimum instruction for each semester / I year shall be 90/180 working days excluding examination days.

12. There shall be no branch transfers after the completion of admission process.

13. There shall be no place transfer within the Constituent Colleges of Jawaharlal Nehru Technological University for B.Tech. Regular / FDH / CCC and P. G. Programmes.

General:

14. Where the words "he", "him", "his", occur in the regulations, they include "she", "her", "hers".

15. The academic regulation should be read as a whole for the purpose of any interpretation.

16. In the case of any doubt or ambiguity in the interpretation of the above rules, the decision of the Vice-Chancellor is final.

17. The University may change or amend the academic regulations or syllabi at any time and the changes or amendments made shall be applicable to all the students with effect from the dates notified by the University.

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

Academic Regulations for B. Tech. (Lateral Entry Scheme)

(Effective for the students getting admitted into II year from the Academic Year 2003-2004 and onwards)

1. The Students have to acquire 156 credits from II to IV year of B.Tech. Programme (Regular) for the award of the degree.

2. Students, who fail to fulfill the requirement for the award of the degree in 6 consecutive academic years from the year of admission, shall forfeit their seat.

3. The same attendance regulations are to be adopted as that of B. Tech. (Regular).

4. Promotion Rule:

   A student shall be promoted from third year to fourth year only if he fulfils the academic requirements of 44 credits from the examinations following

   a. Two regular and one supplementary examinations of II Year I Semester

   b. One regular and one supplementary examinations of II Year II Semester

   c. One regular III year I Semester examination

5. Award of Class:

   After a student has satisfied the requirements prescribed for the completion of the programme and is eligible for the award of B. Tech. Degree he shall be placed in one of the following four classes:

First Class with Distinction	70% and above	From the aggregate marks secured for 156 Credits. (i.e II year to IV year)
First Class	Below 70% but not less than 60%	
Second Class	Below 60% but not less than 50%	
Pass Class	Below 50% but not less than 40%	

(The marks in internal evaluation and end examination shall be shown separately in the marks memorandum)

6. All other regulations as applicable for B. Tech. Four-year degree course (Regular) will hold good for B. Tech. (LES)

2002-2003

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

I YEAR B.TECH.

ELECTRONICS & CONTROL ENGINEERING

COURSE STRUCTURE

CODE	SUBJECT	T	P	C
ECT1021	English	3	-	6
ECT1022	Mathematics – I	3+1*	-	6
ECT1023	Solid State Physics	2+1*	-	4
ECT1024	Information Technology & Numerical Methods	3	-	6
ECT1025	C & Data Structures	3	-	6
ECT1026	Network Theory	3	-	6
ECT1027	Electronic Devices & Circuits	3	-	6
ECT1028	Engineering Drawing Practice	-	3	4
ECT1029	Computer Programming Lab	-	6	8
ECT1030	Electronic Devices & Circuits Lab	-	3	4
		20+2*	**12**	**56**

(* TUTORIAL)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II YEAR B.TECH. I SEMESTER

ELECTRONICS & CONTROL ENGINEERING

COURSE STRUCTURE

CODE	SUBJECT	T	P	C
ECT2121	Mathematics – II	4	-	4
ECT2122	Electrical Technology	4	-	4
ECT2123	Electromagnetic theory	4	-	4
ECT2124	Signals & Systems	4	-	4
ECT2125	Instrumentation Components	4	-	4
ECT2126	Switching Theory & Logic Design	4	-	4
ECT2127	Electrical Technology Lab	-	3	2
ECT2128	Networks Lab	-	3	2
		24	**6**	**28**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II YEAR B.TECH. II SEMESTER

ELECTRONICS & CONTROL ENGINEERING

COURSE STRUCTURE

CODE	SUBJECT	T	P	C
ECT2221	Managerial Economics & Financial Analysis	4	-	4
ECT2222	Mathematics – III	4	-	4
ECT2223	Electrical and Electronic Measurements	4	-	4
ECT2224	Control Systems	4	-	4
ECT2225	Pulse and Digital Circuits	4	-	4
ECT2226	Transducers in Instrumentation	4	-	4
ECT2227	Pulse and Digital Circuits Lab	-	3	2
ECT2228	Instrumentation Lab – I	-	3	2
		24	**6**	**28**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

III YEAR B.TECH. I SEMESTER

ELECTRONICS & CONTROL ENGINEERING

COURSE STRUCTURE

CODE	SUBJECT	T	P	C
ECT3121	Management Science	4	-	4
ECT3122	Computer Operating Systems	4	-	4
ECT3123	Communication Engineering	4	-	4
ECT3124	Operations Research	4	-	4
ECT3125	Linear & Digital IC Applications	4	-	4
ECT3126	Process Control	4	-	4
ECT3127	IC Applications Lab	-	3	2
ECT3128	Control Systems Lab – I	-	3	2
		24	**6**	**28**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

III YEAR B.TECH. II SEMESTER

ELECTRONICS & CONTROL ENGINEERING

COURSE STRUCTURE

CODE	SUBJECT	T	P	C
ECT3221	Computer Networks	4	-	4
ECT3222	Microprocessors & Microcontrollers	4	-	4
ECT3223	Digital Signal Processing	4	-	4
ECT3224	Computer Organization	4	-	4
ECT3225	Robotics & Automation	4	-	4
ECT3226	Advanced Control Systems	4	-	4
ECT3227	Microprocessors Lab	-	3	2
ECT3228	Control Systems Lab – II	-	3	2
		24	**6**	**28**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV YEAR B.TECH. I SEMESTER

ELECTRONICS & CONTROL ENGINEERING

COURSE STRUCTURE

CODE	SUBJECT	T	P	C
ECT4121	OOPS Through JAVA	4	-	4
ECT4122	Neural Networks & Fuzzy Logic Control	4	-	4
ECT4123	Digital Control Systems	4	-	4
ECT4124	Adaptive Control Systems	4	-	4
ELECTIVE – I		4	-	4
ECT4125	Reliability and Safety Engineering			
ECT4126	Database Management Systems			
ELECTIVE– II		4	-	4
ECT4127	Distributed Computer Control Systems			
ECT4128	Industrial Electronics			
ECT4129	JAVA Lab	-	3	2
ECT4130	Control Systems Lab – III	-	3	2
		24	**6**	**28**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV YEAR B.TECH. II SEMESTER

ELECTRONICS & CONTROL ENGINEERING

COURSE STRUCTURE

CODE	SUBJECT	T	P	C
ELECTIVE–III		4	-	4
ECT4221	Artificial Intelligence and Expert Systems			
ECT4222	Telemetry and Telecontrol			
ELECTIVE–IV		4	-	4
ECT4223	Management Information Systems			
ECT4224	Computer Aided Design of Control Systems			
ECT4225	Project & Seminar	-	-	8
		8	**-**	**16**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

I YEAR B.TECH. **– 0 – 6** **ECT1021**

ENGLISH
(Common for All Branches)

The following textbooks of English are prescribed for I B.Tech.Class of all Branches in the Colleges of Engineering and Technology affiliated to Jawaharlal Nehru Technological University, Hyderabad. The exercises given are expected to be covered by the teacher in the classroom, the objective of the course being the development of linguistic skills of the learners.

1. A Textbook of English for Engineers and Technologists, OL.
2. Masterminds, OL.

UNIT – I:
1. Energy, Unit 3: Alternative Sources (from A Textbook of English for Engineers and Technologists, OL).
2. Jagadish Chandra Bose, (a profile from The Trailblazers in Masterminds, OL).

UNIT – II:
1. Computers, Unit 2: New Frontiers (from A Textbook of English for Engineers and Technologists, OL).
2. Chandrasekhara Venkata Raman (a profile from The World of Figures and Physics in Masterminds, OL).

UNIT – III:
1. Technology, Unit 3: Evaluating Technology (from A Textbook of English for Engineers and Technologists, OL).
2. S.S. Bhatnagar (a profile from The Institution Builders in Masterminds, OL).

UNIT – IV:
1. Environment, Unit 1: Pollution (from A Textbook of English for engineers and Technologists, OL).
2. Homi Jehangir Bhabha (a profile from The New Age in Masterminds, OL).

UNIT – V:
1. Industry, Unit 2: Safety and Training (from A Textbook of English for Engineers and Technologists, OL).
2. Salim Ali (a profile from The Living World in Masterminds, OL).

UNIT – VI:

Common Errors

Sentence Completion

Synonyms and Antonyms

Analogy

Report Writing

Comprehension

General Essay

Situational Dialogues

NOTE:

The establishment of an English Language Laboratory in each Affiliated College of Engineering and Technology is recommended with effect from the academic year 2002-03 for the following reasons:

1. to expose the students to TOEFL and GRE model of training and practice.
2. to help the students learn correct pronunciation, accent and intonation.
3. to enable the students to improve and strengthen their communicative skills.
4. to expose the students to different variations in English expression.

It is also recommended that the English Language Laboratory training and practice be treated as a non-examination item of the curriculum.

BOOKS RECOMMENDED:

1. Strengthen Your Writing, by V.R.Narayana Swami (OL).
2. Success with Grammar and Composition, by K.R.Narayanaswamy (OL).
3. Examine Your English, by Margaret Maison (OL).
4. English for Professional Students, by S.S.Prabhakara Rao.
5. TOEFL (ARCO & BARRONS, USA) and Cliff's TOEFL.
6. GRE (ARCO & BARRONS, USA) and Cliff's GRE.
7. Communication Skills for Technical Students, by T.M.Farhathulla (OL).
8. Strategies for Engineering Communication – by Susan Stevenson and Steve White more, John Wiley and Sons.
9. Basic Communication Skills for Technology – by Andrea J. Rutherford, 2/e, Pearson Education Asia.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY, HYDERABAD

I YEAR B.TECH. 3 – 0 – 6 ECT1022

MATHEMATICS – I

(Common to all Branches)

UNIT – I:

Sequences – Series – Convergence and divergence – Ratio test – Comparison test – Integral test – Cauchy's root test – Raabe's test – Absolute and conditional convergence.

Rolle's theorem – Lagrange's Mean Value theorem – Cauchy's Mean value Theorem – Generalized Mean Value theorem (Taylor's Theorem) .

UNIT – II:

Functions of several variables – limit and continuity – partial differentiation – Chain rule – Total derivative – Euler's theorem, Jacobian – Functional dependence. Maxima and Minima of functions of two variables with and without constraints, Radius, Centre and Circle of Curvature – Evolutes and Envelopes.

Curve tracing – Cartesian, polar and Parametric curves. Applications of integration to lengths, volumes and surface areas in Cartesian and Polar coordinates.

UNIT – IV:

Differential equations of first order and first degree – formation. Exact, linear and Bernoulli. Applications to Newton's Law of cooling, Law of natural growth and decay, Orthogonal trajectories, Non-homogeneous linear differential equations of second and higher order with constant coefficients with RHS term of the type e^{ax}, sin (ax), cos (ax), polynomial in x, e^{ax} V(x),xV(x), method of variation of parameters.

UNIT – V :

Laplace transform of standard functions – Inverse transform – Linearity – first shifting

Theorem. Transforms of derivatives and integrals – Unit step function – second shifting theorem – Dirac's delta function – Differentiation and integration of transforms –

Multiple integrals : Double and triple integrals – change of variables – Change of order of integration.

UNIT – VI :

Vector Differential Calculus :

Gradient, Divergence, Curl and their related properties of sums, Products, Laplacian and second order operators.

Vector integral Calculus : Vector integration – Line integral – work done – Potential function – area, surface and volume integrals. Green's theorem, Stoke's and Gauss'

Divergence Theorem. Verification of Green's, Stoke's and Gauss' Theorems. Curvilinear Coordinates – Cylindrical, Spherical Coordinates – Expressions of Grad, div, curl in Spherical, Cylindrical and Curvilinear Coordinates.

TEXT BOOKS :

1. A Text Book of Engineering Mathematics Volume – I, 2002
   T.K.V. Iyengar, B. Krishna Gandhi, and others, S. Chand and Company
2. Engineering Mathematics
   B.V. Ramana, Tata McGraw_Hill 2002
3. Engineering Mathematics – I
   C. Sanakraiah, Vijaya Publications-2002
4. Engineering Mathematics – I - 2002
   P. Nageswara Rao, Y. Narsimhulu, Prabhakara Rao

REFERENCES :

1. Engineering Mathematics
   S.K.V.S. Sri Rama Chary, M. Bhujanga Rao, Shankar, B.S. Publications 2000
2. Advanced Engineering Mathematics (Eighth edition)
   Erwin Kreyszig , John Wiley & Sons (ASIA) Pvt . Ltd. 2001
3. Advanced Engineering Mathematics (Second edition)
   Michael D. Green Berg, Prentice Hall, Upper saddle River, New Jersey-1998
4. Sarveswara Rao Koneru
   Engineering Mathematics Orient Longman Pvt. Ltd. 2002
5. Engineering Mathematics – I
   N.P. Bali, Laxmi Publications (P) Ltd., New Delhi.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

I YEAR B.TECH. 2 – 0 – 4 ECT1023

SOLID STATE PHYSICS

(Common for EEE, ECE, EIE, E.Cont.E, ICE, CSE, IT, CSSE, ETM, ECM, BME)

UNIT – I (A):

Bonding in solids – Cohesive energy – calculation of cohesive energy of ionic solids –application to Sodium Chloride crystal.

UNIT – I (B):

Space lattice – crystal structure – unit cell – lattice parameter – crystal systems – Bravais lattices – stacking sequences, metallic crystals – simple cubic, F.C.C. and B.C.C structures- Structures of Diamond, ZnS, NaCl and CsCl systems.

UNIT – II (A):

Directions and planes in crystals – Miller Indices- distances of separation between successive hkl planes. Imperfections in crystals – point defects – Frenkel and Schottky defects – Energy of formation of a vacancy – Number of vacancies at any given temperature.

UNIT – II (B):

Line defects – Edge and Screw dislocations – Burger's vector. Diffraction of X-rays by crystal planes – Bragg's law – Laue photograph – Powder method.

UNIT – III (A): PRINCIPLES OF QUANTUM MECHANICS

Waves and Particles – de Broglie hypothesis - G.P Thompson's experiment – Davisson and Germer's experiment –

Schroedinger's wave equation (Time independent) – Physical significance of the wave function. Particle in potential box.

UNIT – III (B): ELECTRON THEORY OF METALS

Classical free electron theory – Mean free path, relaxation time and drift velocity – Fermi-Dirac distribution (non-mathematical treatment) – Quantum free electron theory of conduction scattering – Sources of electrical resistance – Kronig-Penny model (non- mathematical treatment) – Origin of energy band structure in solids – Concept of effective mass.

UNIT – IV (A): DIELECTRIC PROPERTIES

Introduction – Electronic, Ionic and Orientation polarization – Internal field – Clausius Mosotti equation – Ferro and Piezo electricity (non-mathematical treatment) – Frequency dependence of Dielectric Constant (non-mathematical treatment) – Important requirements of Insulators.

UNIT – IV (B): MAGNETIC PROPERTIES

Permeability – Magnetization – Origin of magnetic moment – Bohr magneton - Electron spin – Classification of magnetic materials – Domain theory of Ferro Magnetism – Hysteresis curve – Ferri and Anti-ferro magnetic substances – Ferrites and their applications – Requirements of magnetic materials for different purposes.

UNIT – V (A): SEMICONDUCTORS

Electrical conductivity of semiconductors – Intrinsic semiconductors – carrier concentration – Extrinsic semiconductors - carrier concentration – Minority carrier lifetime – drift and diffusion – Einstein's Equation – Equation of continuity – Hall effect.

UNIT – V (B): SUPERCONDUCTIVITY

General features – Meissner effect – Penetration depth – Type I and Type II superconductors – Flux quantization – Josephson Effect – BCS theory - Applications of superconductors.

UNIT – VI (A): LASERS

Spontaneous and Stimulated Emission – Einstein's Coefficients – Condition for Population inversion – Ruby Laser – He-Ne Laser – Semiconductor Laser – Applications of Lasers.

UNIT – VI (B): FIBRE OPTICS

Principle of Optical fibre – Step-index fibre – graded-index fibre – numerical aperture – Acceptance angle – Transmission signal in Step-index and graded-index fibre – Optical fibres in communication and sensing applications.

TEXT BOOK:

1. Solid State Physics – by S.O. Pillai (New Age International).

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

I YEAR B.TECH. **3 – 0 – 6** **ECT1024**

INFORMATION TECHNOLOGY & NUMERICAL METHODS

(Common for EEE, ECE, EIE, E.Cont.E, ICE, CSE, IT, CSSE, ETM, ECM, BME)

UNIT – I:

Parts of a computer: Processor, memory, I/O devices, storage devices, operating system, application software

Types of computer systems: Supercomputer, Mainframe computer, Minicomputer, workstations, Microcomputers, Personal computers, desktop handheld computers.

Input devices: Keyboard, mouse, hand devices optical devices, audio visual devices.

Output devices: monitor, projectors, sound devices, printers, storage devices, files (Lessons 1,2,3,4,5,6,9 and 10 of text book1).

UNIT – II:

Data Processing: Data representation, data processing method, data processing speed, processor power, Intel, AMD, Cyrix, Motorola, RISC processors

Operating system; User interface, program running, file management, hardware management , PC Operating Systems, Dos, Unix Windows, Windows NT

Program development: hardware/software interaction, problem to a program, structured and object oriented approaches, Programming languages, machine and high-level languages

(Lessons 7,8,11,12,15, 27 and 28 of text book1)

UNIT – III:

Database management: Databases, the DBMS, working with a database and enterprise software.

Data communication and Networking: Use of networks, network structures, network topologies, network media, telephone lines, modems, digital telephones, Internet, working of Internet, Internet features, Internet applications, Accessing the Internet, connecting PC to Internet, connecting to WWW.

(Lessons 16,17,18,19 and 20 of text book1)

UNIT – IV: (to be taught online through PC)

Microsoft windows ME and tools: Office 2000, Word 2000, Excel 2000, Powerpoint 2000, Access 2000, Outlook 2000, Frontpage 2000.
(Chapters 4 to 25 of text book 2).

UNIT – V:

Numerical Methods - I

Iterative methods, bisection method, Newton Raphson method, successive approximation method, Gauss Jordan and Gauss Siedel methods; Interpolation, Lagrange interpolation forward difference, backward difference and central difference interpolation methods.

UNIT – VI:

Numerical Methods - II

Numerical Integration by Trapezoidal and Simpson's rules, algorithms, numerical solution to differential equations, Euler method, Runga kutta method, Milne predictor corrector method, algorithms; Comparison of Runga kutta method and predictor corrector method; Regression techniques

TEXT BOOKS:

1. Introduction to Computers – by Peter Norton, Tata McGraw-Hill, 4th Edition, 2001, ISBN: 0-07-044743-8.
2. Introduction to Computers with MS-Office 2000 – by Alexis Leon and Mathews Leon, Tata McGraw-Hill, 2001, 0-07-043445-X.
3. Computer oriented Numerical Methods – by V. Rajaraman
4. Numerical Methods for Scientific and Engineering Computation – by M. K. Jain,

   S. R. K. Iyengar, R. K. Jain, New Age International (P) Ltd.

REFERENCES:

1. Using information technology – a practical introduction to computers and communication – by Williams, Sawyer and Hutchins, Tata McGraw Hill, 2000
2. Computers and common sense – by Shelly and Hunt; Prentice Hall of India

3. Fundamentals of Information Technology – by Alexis Leon, Mathews Leon, Leon Press and Vikas Publishing House.
4. Using Information Technology: A Practical Introduction to Computers & communications – by Brian Williams, Stacey Sawyer, and Sarah Hutchinson, Tata McGraw-Hill, 3rd Edition, 2001, ISBN: 0-07-043562-6.
5. Upgrading and Repairing PCs – by Scott Mueller, Pearson Education Asia, 13th Edition, 2002, ISBN: 81-7808-552-6.
6. Trouble Shooting, Maintaining & Repairing PCs – by Stephen J. Bigelow, Tata McGraw-Hill Publishing Company, 5th Edition, 2001, ISBN: 0-07-047367-6.
7. Introduction to Information Technology – by Efraim Turban, R. Kelly Rainer, Jr., Richard Potter, John Wiley & Sons, 2000, ISBN: 9971-51-21-8.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

I YEAR B.TECH. **3 – 0 – 6** **ECT1025**

C & DATA STRUCTURES

(Common for EEE, ECE, EIE, E.Cont.E, ICE, CSE, IT, CSSE, ETM, ECM, BME)

UNIT – I:

Algorithm, flowchart, program development steps, basic structures of C language, C tokens, data types, declaration of variables, assigning values, arithmetic, relational and logical operator, increment and decrement operators, control operator, bit-wise operator, expressions, evaluation, input-output operators, IF and SWITCH statement, WHILE, DO-WHILE and FOR statements, C programs covering all the above aspects.

UNIT – II:

One dimensional & Two dimensional arrays, initialisation, string variables, declaration, reading, writing, string handle function, user-defined functions variables & storage classes, example C Programs.

UNIT – III:

Structure definition, initialising, assigning values, passing of structures as arguments, unions, declaring & initialising of pointers, pointer based expressions, arrays, strings, functions and structures, C Program examples, file management in C, opening & Closing, I-O operations on files.

UNIT – IV:

Stacks, represnting stacks in C, Infix, Postfix & Prefix programs, recursion in C, Queue & its sequential representation, circular queue, sequence.

UNIT – V:

Single Linked List, Double linked list, Header, Circular List, applications, binary trees, representation, tree traversals, graph representaltion, graph traversals, spanning trees.

UNIT – VI:

Search techniques: linear and binary search methods, sorting methods, Exchange sort, selection sort, quick sort, tree sort.

TEXT BOOKS:

1. C & Data Structures – by E. Balagurusamy, TMH 2002.
2. Data structures using C – by A. S. Tanenbaum, PHI
3. Fundamentals of Data Structures – by Horowitz & Sahani

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

I YEAR B.TECH. **3 – 0 – 6** **ECT1026**

NETWORK THEORY

(Common for EEE, ECE, EIE, E.Cont.E, ICE, CSE, IT, CSSE, ETM, ECM, BME)

UNIT – I:

Circuit concept – RLC parameters – Voltage and Current sources – Source transformation – Voltage–Current relationship for Passive elements – Kirchhoff's laws – Network Reduction Techniques – Series, Parallel, Series-Parallel, Star-to-delta or delta-to-star transformations.

Magnetic Circuits – Faraday's Laws of electromagnetic induction – Concept of self and mutual inductances – dot convention – coefficient of coupling – Composite Magnetic Circuits – Analysis of Series and Parallel Magnetic Circuits.

UNIT – II:

RMS and Average values and Form factor of different periodic waveforms, Steady state analysis of R, L and C (in series, parallel and series-parallel combinations) with sinusoidal excitation – Concept of Reactance, Impedance, Susceptance and Admittance – Phase and phase difference – Concept of Power factor, Real and Reactive powers – j–notation, Complex and polar forms of representation, Complex power – Locus diagrams. Series R-L, R-C, R-L-C and parallel combinations with variation of various parameters – Resonance – Series, Parallel Circuits, Concept of Bandwidth and Q-factor.

UNIT – III:

Three phase circuits: Phase sequence – Star and Delta connection – Relation between line and phase voltages and currents in Balanced systems – Analysis of balanced and Unbalanced 3 phase circuits – Measurement of 3 phase power, active power and reactive power.

Network topology : Definitions – Graph – Tree, Basic Cutset and Basic Tieset matrices for planar network – Loop and nodal methods of analysis of networks with dependent and

independent voltage and current sources. Duality and Dual networks.

UNIT – IV:

Network theorems (without proof): Tellegen's, Superposition, Reciprocity, Thevenin's, Norton's, Maximum Power Transfer, Millman's and Compensation theorems for dc and ac excitations.

UNIT – V:

Transient response of RL, RC and RLC circuits (series and parallel combinations) for dc and Sinusoidal excitations – Initial conditions – Classical method and Laplace transform Methods of solutions – Response of RL, RC, RLC for step, ramp, pulse and impulse excitations using Laplace Transform Methods.

UNIT – VI:

Two port network parameters – Z, Y, (ABCD) Transmission and Hybrid Parameters for Resistive Networks – concept of Transformed Network – 2-port network parameters using transformed variables.

Filters – Low pass, High pass and Band pass filters – Constant-k and m-derived filters and composite filter design.

TEXT BOOKS:

1. Engineering Circuit Analysis – by William Hayt and Jack E. Kemmerly, McGraw Hill, 5/e.
2. Electric Circuits – by J. Edminister and M. Nahvi, - Schaum's outlines, TMH, 1999.
3. Network Theory – by N. Srinivasulu, Hi-Tech Pub.

REFERENCES:

1. Network Analysis – by G.K. Mithal, Khanna Pub.
2. Network Theory – by N.C. Jagan and C. Lakshminarayana, BS Publ.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

I YEAR B.TECH. **3 - 0 - 6** **ECT1027**

ELECTRONIC DEVICES & CIRCUITS

(Common for EEE, ECE, EIE, E.Cont.E, ICE, CSE, IT, CSSE, ETM, ECM, BME)

UNIT – I: ELECTRON DYNAMICS AND CRO

Motion of charged particles in electric and magnetic fields. Simple problems involving electric and magnetic fields only. Electrostatic and magnetic focusing. Principles of CRT, deflection sensitivity (Electrostatic and magnetic deflection). Applications of CRO: Voltage, Current and Frequency Measurements.

UNIT – II: SEMICONDUCTOR DIODES AND RECTIFIERS

Construction, Principle of operation, V-I characteristics, symbol, equivalent circuit, parameter calculation, limitations and specifications of – pn junction diode, Zener diode, Varactor diode, Tunnel diode and photo diode. Diffusion and transition capacitances of pn junction diode. Hall Effect. Diode applications : Rectifiers – Half wave, Full wave and Bridge Rectifiers, Filters – L, C, L-Section and π -section filters.

UNIT – III: TRANSISTOR CHARACTERISTICS

Construction, principle of operation, V-I characteristics, symbol, equivalent circuit, parameter calculations, applications, limitations and specifications of – BJT, FET, UJT and MOSFETs (different configurations of transistors are to be considered). SCR, DIAC, TRIACs. Optoelectronic devices.

UNIT – IV: AMPLIFIERS

Biasing, DC equivalent model, criteria for fixing operating point and methods of Bias stabilization, Thermal run away and thermal stability. Small signal low frequency transistor amplifier circuits: h-parameter representation of a transistor, Analysis of single stage transistor amplifier using h-parameters: voltage gain, current gain, Input impedance and Output impedance. Comparison of BJT and FET. RC coupled amplifier – frequency response. Biasing of FET, MOSFET. FET amplifier – frequency response, FET Small signal model.

UNIT – V: FEEDBACK AMPLIFIERS

Concepts of feedback. Classification of feedback amplifiers, General characteristics of negative feedback amplifiers, Effect of Feedback on Amplifier characteristics, Simple problems.

UNIT – VI: OSCILLATORS

Condition for oscillations. RC and LC type oscillators, Crystal oscillators, Frequency and amplitude stability of oscillators, Generalized analysis of LC oscillators, Quartz (Hartley, Colpitts), RC-phase shift and Wien-bridge oscillators.

TEXT BOOKS:

1. Electronic Devices and Circuits – by Millman and Halkias, Tata McGraw Hill.
2. Electronic Devices and Circuits – by R.L. Boylestad and Louis Nashelsky,

   Pearson Ed. Asia, PHI.
3. Electronic Devices and Circuits – by K. Lal Kishore, B.S. Publ.

REFERENCES:

1. Microelectronics – by Millman and Grabel, Tata McGraw Hill.
2. Electronic Devices and Circuits – by Bogart, Universal Bookstall, New Delhi.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

I YEAR B.TECH. **0 – 3 – 4** **ECT1028**

ENGINEERING DRAWING PRACTICE

(Common for EEE, ECE, EIE, E.Cont.E, ICE, CSE, IT, CSSE, ETM, ECM, BME)

UNIT – I:

Introduction to Engineering Graphics – Construction of Ellipse, Parabola and Hyperbola. Cycloidal Curves.

UNIT – II:

Orthographic Projections of Points, Lines and Planes – Axis inclined to one plane and inclined to both the planes.

UNIT – III:

Orthographic Projections of Solids: Cylinder, Cone, Prism, Pyramid and Sphere in simple positions and Axis inclined to both the Planes.

UNIT – IV:

Development of Surfaces: Prisms, Cylinder, Pyramid and Cone.

UNIT – V:

Isometric Projections of Lines, Planes and Simple Solids.

UNIT – VI:

Conversion of Orthographic Views into Isometric Views and Vice-Versa.

TEXT BOOKS:

1. Engineering Graphics – by K.L. Narayana & P. Kannayya, SciTech Publishers.
2. Engineering Drawing – by N.D. Bhatt, Charotar Publishers.
3. Engineering Drawing and Graphics – by Venugopal, New Age International Limited.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

I YEAR B.TECH. **0 – 6 – 8** **ECT1029**

COMPUTER PROGRAMMING LAB

(Common for EEE, ECE, EIE, E.Cont.E, ICE, CSE, IT, CSSE, ETM, ECM, BME)

1. Write a C program the evaluates the following algebraic expressions after reading necessary values from the user:
   a) ax+b/ax-b
   b) $2.5 \log x + \cos 32^0 + | x^2 - y^2 | + \sqrt{2xy}$
   c) $1/\alpha\sqrt{2\pi}\, e^{-(x-m/\sqrt{2}\sigma)^2}$
2. Write a C program for the following
   a) Printing three given integers in ascending order
   b) Sum of $1 + 2 + 3 + \_\_\_\_\_ n$
   c) $1 + x^2/2! + x^2/4! + \_\_\_\_\_$ upto ten terms
   d) $x + x^3/3! + x^5/5! + \_\_\_\_\_$ upto 7^{th} digit accuracy
   e) Read x and compute Y =1 for x > 0
      Y=0 for x = 0
      Y= -1 for x<0
3. Write C program using FOR statement to find the following from a given set of 20 integers.
   i) Total number of even integers.
   ii) Total number of odd integers.
   iii) Sum of all even integers.
   iv) Sum of all odd integers.
4. Write a C program to obtain the product of two matrices A of size (3x3) and B of size (3x2). The resultant matrix C is to be printed out along with A and B. Assume suitable values for A & B.
5. Using switch-case statement, write a C program that takes two operands and one operator from the user, performs

the operation and then prints the answer. (consider operators +,-,/,* and %).

6. Write C procedures to add, subtract, multiply and divide two complex numbers (x+iy) and (a+ib). Also write the main program that uses these procedures.

7. The total distance traveled by vehicle in 't' seconds is given by distance = $ut+1/2at^2$ where 'u' and 'a' are the initial velocity (m/sec.) and acceleration (m/sec^2). Write C program to find the distance traveled at regular intervals of time given the values of 'u' and 'a'. The program should provide the flexibility to the user to select his own time intervals and repeat the calculation for different values of 'u' and 'a'.

8. A cloth show room has announced the following seasonal discounts on purchase of items.

Purchase Amount	Discount (Percentage)	
	Mill Cloth	Handloom items
1-100	-	5.0
101-200	5.0	7.5
201-300	7.5	10.0
Above 300	10.0	15.0

Write a C program using switch and If statements to complete the net amount to be paid by a customer.

9. Given a number, write C program using while loop to reverse the digits of the number. Example 1234 to be written as 4321.

10. The Fibonacci sequence of numbers is 1,1,2,3,5, based on the recurrence relation

f(n) = f (n-1) + f (n-2) for n>2.

Write C program using d0-while to calculate and print the first m fibonacci numbers.

11. Write C programs to print the following outputs using for loop.

```
1
2 2
3 3 3
4 4 4 4
5 5 5 5 5
```

```
        1
      2 2
    3 3 3
  4 4 4 4
5 5 5 5 5
```

12. Write a C program to extract a portion of a character string and print the extracted string. Assume that m characters are extracted starting with the nth character.

13. A Maruthi Car dealer maintains a record of sales of various vehicles in the following form:

Vehicle type	Month of sales	Price (Rs)
Maruthi – 800	02 / 87	75,000
Maruthi – DX	07 / 87	95,000
Gypsy	04 / 88	1,10,000
Maruthi Van	08 / 88	85,000

Write a C program to read this data into a table of strings and output the details of a particular vehicle sold during a specified period. The program should request the user to input the vehicle type and the period (Starting month & ending month).

14. Write a function that will scan a character string passed as an argument and covert all lower case characters into their upper case equivalents.

15. Implement the following data structures using Arrays

(i) Stacks (ii) Linear Queues (iii) Circular queues (iv) Dequeue.

16. Implement polynomial addition and multiplication with linked list sparse matrix.

17. Implement binary search tree using linked list and perform the following operations.
(i) Insertion (ii) Deletion (iii) Inorder Traversal (iv) Preorder Traversal (v) Post Order Traversal.

18. Singly linked list and doubly linked lists

(i) Insertion (ii) Deletion (iii) Lookup

19. (i) Implement stack using singly linked list.
    ii) Implement queue using singly linked list.
20. Implement the following sorting techniques.
    (i) Bubble sort (ii) Insertion Sort (iii) Quick Sort (iv) Heap Sort.
21. Implement the following searching method.
    (i) Sequential Search (ii) Binary Search (iii) Fibonacci
22. (i) Conversion of Infix expression to Postfix notation.
    (ii) Simple expression evaluator, that can handle +,-,/and *.
23. Implement the algorithms for the following iterative methods using C to find one root of the equation f(x)=x sinx + cosx=0.
    a) Bisection (b) False Position (c) Newton-Raphson (d) Successive approximation.
24. Write programs for implementing Gauss-Jordan and Gauss-Seidal methods for solving simultaneous algebraic equations given below.

$$9x_1+2x_2+4x_3 = 20$$
$$x_1+10x_2+4x_3 = 6$$
$$2x_1-4x_2+10x_3 = -15.$$

25. Write Computer programs to implement the Lagrange interpolation and Newton-Gregory forward interpolation.
26. Implement in 'C' the linear regression and polynomial regression algorithms.
27. Implement Traezoidal and Simpson methods.
28. Practice of exercises (in text book 2 of theory) related to:
    a) Word 2000 Chapter 7, 8, 9.
    b) Excel 2000 Chapter 12, 13.
    c) Powerpoint- 2000 Chapter 15, 16.
    d) Access 2000 Chapter 18,19.
    e) Outlook 2000 Chapter 21,22,23.
    g) FrontPage 2000 Chapter 25

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

I YEAR B.TECH. **0 – 3 – 4** **ECT1030**

ELECTRONIC DEVICES & CIRCUITS LAB

(Common for EEE, ECE, EIE, E.Cont.E, ICE, CSE, IT, CSSE, ETM, ECM, BME)

1. PN Junction diode characteristics
   A. Forward bias B. Reverse bias.
2. Zener diode characteristics
3. Transistor CB characteristics (Input and Output)
4. Transistor CE characteristics (Input and Output)
5. Transistor CC characteristics (Input and Output)
6. Rectifier without filters (Full wave & Half wave)
7. Rectifier with filters (Full wave & Half wave)
8. FET characteristics
9. UJT characteristics
10. Study of CRO
11. Measurement of h parameters of transistor in CB, CE, CC configurations
12. CE amplifier
13. CC amplifier (emitter follower)
14. Single stage R-C coupled Amplifier.
15. FET amplifier (Common Source)
16. FET amplifier (Common Drain)
17. Wien Bridge Oscillator
18. RC Phase Shift Oscillator
19. Feed back amplifier (Current Series).
20. Feed back amplifier (Voltage Series).
21. Colpitts Oscillator
22. Hartley Oscillator
23. SCR characteristics.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II B.TECH. I-SEMESTER **4 – 0 – 4** **ECT2121**

MATHEMATICS – II
(Common for all Branches)

UNIT – I

Matrices – brief review – Inverse of a matrix by adjoint , elementary row transformations – Rank - Normal form – eachelon form. Augmented matrix – Consistency – Solution of system of simultaneous linear homogeneous and non-homogeneous equations.

UNIT – II

Eigen values, eigen vectors – properties – Cayley-Hamilton Theorem (Inverse and powers of a matrix by Cayley-Hamilton theorem). Quadratic forms – positive, negative definite – Diagnolization of matrix. Calculation of powers of matrix – Modal and sprectral matrices. Real matrices – Symmetric, skew-symmetric, orthogonal. Linear Transformation – Orthogonal Transformation. Quadratic forms – Reduction of quadratic form to canonical form – index – signature.

Complex matrices : Hermitian, Skew-Herimitian and Unitary – Eigen values and eigen vectors of complex matrices and their properties.

UNIT – III : Fourier Series

Determination of Fourier coefficients – Fourier series – even and odd functions – Fourier series in an arbitrary interval – even and odd periodic continuation – Half-range Fourier sine and cosine expansions.

UNIT – IV :

Formation of Partial differential equations by elimination of arbitrary constants and arbitrary functions – solutions of first order linear (Lagrange) equation and nonlinear (standard type) equations. Method of separation of variables – Classification of second order linear Partial Differential Equations, solutions of one dimensional heat equation, wave equation and two-dimensional Laplace's equation under initial and boundary conditions.

UNIT – V

Fourier integral theorem – Fourier sine and cosine integrals. Fourier transform – Fourier sine and cosine transforms – properties – Inverse transforms – Finite Fourier transforms. Solution of one dimensional wave, heat equations and two dimensional Laplace's equation by Fourier transforms.

z-transform – Inverse z-transform – properties – Damping rule – shifting rule – Initial and final value theorems.

Convolution theorem – Solution of difference equations by z-transforms.

TEXT BOOKS :

1. A Text Book of Engineering Mathematics Volume – II - 2002
T.K.V. Iyengar, B. Krishna Gandhi and others, S. Chand and Company
2. Engineering Mathematics
B.V. Ramana, Tata McGraw-Hill -2002
3. Engineering Mathematics – II - 2002
C. Sankaraiah, Vijaya Publications
4. Engineering Mathematics – II - 2002
P. Nageswara Rao, Y. Narsimhulu, Prabhakar Rao

REFERENCES :

1. Engineering Mathematics
S.K.V.S. Sri Rama Chary, N. Bhujanga Rao, P. Bhaskara Rao, B.S. Publications 2000
2. Advanced Engineering Mathematics (Eighth edition)
Erwin Kreyszig, John Wiley & Sons (ASIA) Pvt. Ltd. - 2001
3. Advanced Engineering Mathematics (Second edition)
Michael D. Green Berg, Prentice Hall, Upper saddal River, New Jersey-1998
4 Sarveswara Rao Koneru
Engineering Mathematics Orient Longman (Pvt.) Ltd. 2002
5 Engineering Mathematics - II
N.P. Bali, Laxmi Publications (P) Ltd., New Delhi.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II B.TECH. I-SEMESTER 4 – 0 – 4 ECT2122

ELECTRICAL TECHNOLOGY

(Common for ECE, EIE, E.Cont.E, CSE, IT, BME)

UNIT-I: DC MACHINES
Principle of operation of DC Machines- EMF equation -- Types of generators – Magnetization and load characteristics of DC generators – DC Motors – Types of DC Motors – Characteristics of DC motors – 3-point starters for DC shunt motor – Losses and efficiency – Swinburne's test – Speed control of DC shunt motor – Flux and Armature voltage control methods.

UNIT-II: TRANSFORMERS:
Principle of operation of single phase transformer – types – Constructional features – Phasor diagram on No Load and Load – Equivalent circuit – Losses and Efficiency and Regulation – OC and SC tests – Predetermination of efficiency and regulation.

UNIT-III: THREE PHASE INDUCTION MOTOR:
Principle of operation of three-phase induction motors – Constructional features – Slip ring and Squirrel cage motors – Slip-Torque characteristics – Efficiency calculation – Starting methods.

UNIT-IV:
Synchronous generators – Constructional features – types – EMF Equation – Distribution and Coil span factors – Predetermination of regulation by Synchronous Impedance Method – OC and SC tests.

Principle of operation of synchronous motor.

UNIT-V:
Single Phase Induction Motors – Constructional features – Shaded pole motors – Capacitor motors, AC servomotor, AC tachometers, Synchros, Stepper Motors – Characteristics.

TEXT BOOKS:

1. Electrical Technology – Edward Hughes, 7th Edition – Pearson Education.
2. Introduction to Electrical Engineering – M.S Naidu and S. Kamakshaiah, TMH Publ.

REFERENCES:

1. Electrical Engineering – Del Toro, 2nd Edition, Prentice Hall of India.
2. Electrical Machines – P.S Bhimbra, Khanna Publishers.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II YEAR B.TECH. I-SEMESTER **4 – 0 – 4** **ECT2123**

ELECTROMAGNETIC THEORY

(Common for EIE & E.Cont.E)

UNIT – I: ELECTROSTATICS

Review of vector of analysis. Coulomb's law. Electric field intensity, electric field intensity due to point charges, line charges, surface charge and volume charge, distributions, electric field intensity due to standard charge configurations-point charge, uniform infinite line charge, uniform infinite planer charge, electric flux and flux density, Gauss's law, relation between electric field intensity and electric flux density, special Gaussian surfaces and applications of Gauss's law, Divergence theorem, work done in moving a point, electric potential between two points, electric potential due to various charge configurations, equi-potential surfaces, Gradient relationship between electric field and electric potential.

Energy stored in static electric fields, Capacitance of conductor, Capacitance of standard conductor configuration, Parallel plates, concentric cylinders, concentric spherical conductors, experiments mapping methods for electrical fields. Dielectric polarization and relative permittivity. Poisson's and Laplace's equations, Electrostatic uniqueness theorem, boundary conditions in Static electric fields.

UNIT-II: MAGNETOSTATICS

Magnetic induction, Faraday's law, Magnetic flux and Magnetic flux density. Biot Savart Law, Ampere's circuit law, Curl, Stoke's theorem, Magnetic vector potential, Lorentz force equation, Ampere's force law, Force between two parallel conductors, energy stored in steady magnetic fields, magnetization and permeability. Boundary conditions in magnetostatics, analogy between electric and magnetic fields.

UNIT – III: MAXWELL'S EQUATIONS

Current continuity equations for time varying fields, inconsistency of Ampere's law, Maxwell's equations – differential form and

integral form, word statement of field equations, Boundary conditions for electromagnetic fields – statement and proof, Maxwell's equations.

UNIT – IV: ELECTROMAGNETIC WAVES

Vector wave equations for source free regions, Plane Waves, Uniform Plane Wave Propagation, relation between E and H in a Uniform Plane, Wave Equations for sinusoidally varying fields, Wave Propagation constant, classification of materials as conductors and dielectrics, dissipation factor and power factor, Wave Propagation in good conductors and good dielectrics, Skin depth or Depth of Penetration, Polarization – Linear, Circular and Elliptical Polarization, Axial ratios.

UNIT – V: REFLECTION AND REFRACTION OF PLANE WAVES – SURFACE WAVES

Reflection and refraction of plane waves at dielectric – dielectric, conductor – dielectric interfaces for normal and oblique incidence, Brewster angle, Phenomenon of total internal reflection, Concept of surface wave, surface impedance of a conductor, the relation between surface resistance, Skin depth and conductivity of conductor.

POYNTING VECTOR

Poynting theorem, applications of Poynting vector, Instantaneous, average and complex Poynting vector, Power vector, Power loss calculation in a plane conductor.

REFERENCES:

1. Electromagnetic Waves and Radiating Systems – by E.C. Jordan and K.G. Balman, PHI.
2. Elements of Electromagnetics – by Mathew N.O. Sadiku Oxford Univ. Press, 2/e, 1995.
3. Electromagnetics – by Krauss and Carver, McGraw Hill Co.Pvt.Ltd.
4. Introduction to Electromagnetic Fields – by Paul and Clayton, McGraw Hill, 3/e, 1998.
5. Electromagnetics – by John D.Krauss, MGH.
6. Fields and Waves in Communication Electronics – by Ramo, Whinnery and Van Duja, JW.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II B.TECH. I-SEMESTER **4 – 0 – 4** **ECT2124**

SIGNALS & SYSTEMS

(Common for ECE, EIE, E.Cont.E)

UNIT – 1: SIGNAL ANALYSIS

Analogy between vectors and signals, orthogonal vector and signal spaces, approximation of a function by a set of mutually orthogonal functions, evaluation of mean square error, closed or complete set of orthogonal functions, Orthogonality in complex functions, trigonometric and exponential Fourier Series, representation of periodic function by Fourier series, complex Fourier spectrum, representation of arbitrary function, concept of Fourier transform (F.T.), F.T. of simple functions, concept of impulse function, F.T. involving impulse functions, properties of Fourier transforms, concept of convolution in time domain and frequency domain,. graphical representation of convolution, sampling theorem and its proof, effect of undersampling.

UNIT – II: SIGNAL TRANSMISSION THROUGH SYSTEMS:

Linear system, impulse response, response of a linear system, linear time invariant (LTI) system, Linear time variant (LTV) system, Transfer function of a LTI system. Filter characteristics of linear systems. Distortionless transmission through a system, signal bandwidth, system bandwidth. Ideal LPF, HPF and BPF characteristics, causality and physical realization, relationship between bandwidth and rise time. Energy density spectrum, Parseval's theorem, power density spectrum.

UNIT – III: CORRELATION OF SIGNALS AND CONVOLUTION:

Cross correlation and auto correlation of functions, properties of correlation function, relation between auto correlation function and energy/power spectral density function.

UNIT – IV: LAPLACE TRANSFORMS:

Review of Laplace transforms, partial fraction expansion, inverse Laplace transforms, concept of region of convergence (ROC) for Laplace transforms. Constraints on ROC for various classes of signals, properties of L.T.s, relation between L.T. and F.T. of a

signal. Laplace transform of certain signals using waveform synthesis.

UNIT – V: z-TRANSFORMS.
Fundamental difference between continuous and discrete time signals, discrete time complex exponential and sinusoidal signals, periodicity of discrete time complex exponential signal, concept of z-transform of a discrete sequence. Distinction between Laplace, Fourier & z-transforms. Region of convergence in z-transforms, constraints on ROC for various classes of signals, Inverse z-transforms, properties of z-transforms.

TEXT BOOKS:

1. Signals, Systems and Communications – by B.P. Lathi, BS Publ.
2. Signals and Systems – by A.V.Oppenheim, A.S.Willsky & S.H. Nawab, PHI, EEE.

REFERENCES:

1. Signals & Systems – by Simon Haykin, Wiley Student Ed.
2. Network Analysis – by M.E. Van Valkenberg, PHI Publ.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II B.TECH. I-SEMESTER **4 – 0 – 4** **ECT2125**

INSTRUMENTATION COMPONENTS
(Common for EIE and E.Cont.E)

UNIT – I: MECHANICAL COMPONENTS

Pivots & Bearings, Linkages, Gears, belt Chain & Friction Drivers ,dials ,scales, pointers & indicating Mechanism, Ratchets, Counters, Escapements, integrators, Rack & Pinion, Geneva Mechanism.

UNIT – II: PNEUMATIC COMPONENTS

Flapper nozzle, bellows, boosters, pneumatic relays, flip-flops, safety relief valves & pilot valves , pneumatic cylinders motors, pneumatic operated valves.

UNIT – III: ELECTRICAL & ELECTROMECHANICAL COMPONENTS

Transformers-pulse transformers, relays & switches, potentiometers, synchros-magnetic amplifiers , ac & dc servo motors Stepper motors

UNIT – IV: ELECTRONIC COMPONENTS

Different types of registers, capacitors & inductors- different types of diodes , Transistors –bipolar. FET&UJT. Thyristors-SCR, Diac & Triac, selected IC chips-741,555,725,723,LM 317

UNIT – V: OPTOELECTRONIC COMPONENTS

Optoelectronics devices-LED, LDR, photo detectors arrays, Optocouplers, PIN Diodes, Transistors-bi-polar . FET and UJT. Thyristors-SCR, Diac and Triac, selected IC chips – 741,555,725,723,LM317.

REFERENCE BOOKS:

1. Gibson , T.EE and Tetuer.FB., Control system Components, McGraw HILL, NewYork,1993.
2. Greenwood., Mechanical details for product design, McGraw Hill, Newyork,1990

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II B.TECH. I-SEMESTER **4 – 0 – 4** **ECT2126**

SWITCHING THEORY & LOGIC DESIGN
(Common for ECE, EEE, EIE, E.Cont.E, CSE, IT)

UNIT – I:

NUMBER SYSTEMS & CODES:

Review of number systems – binary arithmetic – binary weighted and non-weighted codes – error detecting and error correcting codes.

BOOLEAN ALGEBRA:

Postulates and theorems; representation of switching functions – SOP & POS forms – Karnaugh Map representation – Minimisation using K-maps.

UNIT – II: DESIGN OF COMBINATIONAL CIRCUITS:

Tabular minimization – design of single output and multi output functions – design using conventional AND, OR, NOT, NAND, NOR & EX – OR gates. Design using MSI & LSI devices – Digital multiplexer / selector decoder, demultiplexer – design of 4 bit adder, carry look-ahead adder, magnitude comparator – BCD converter, logic implementations using ROM, PAL & PLA.

UNIT – III: INTRODUCTION TO SEQUENTIAL CIRCUITS:

Combinational versus sequential circuits, Asynchronous versus synchronous circuits - State table and state diagram – state assignment – Memory elements and their excitation functions – T flip flop, D flip flop, RS flip flop, JK flip-flops and their excitation requirements – Design of synchronous sequential circuits like Sequence Detectors and binary counters.

UNIT – IV: CAPABILITIES & MINIMIZATION OF SEQUENTIAL MACHINES:

Melay and Moore machines – capabilities and limitations of finite state machine - state equivalence and machine minimization.

UNIT – V: ALGORITHMIC STATE MACHINES:
ASM chart, Timing considerations, control implementation, Design with multiplexers and PLA control. Introduction to unate functions and threshold logic.

TEXT BOOKS:

1. Switching and Finite Automata Theory – by Zvi Kohavi, TMH edition.
2. Digital Logic and Computer Design – by M. Morris Mano, PHI.
3. Digital Logic Design Principles – by Norman Balbamian and Breadly, John Wiley.

REFERENCES:

1. Intorduction to Switching Theory and Logic Design – by F.J. Hill and Peterson, John Wiley Publications.
2. Digital Logic - Applications & Design – by John M. Yarbrough, Vikas Publications, 1997.
3. Digital Systems Design – by R.P. Jain, TMH.
4. Digital Systems : Principles and Applications – Ronald J. Tocci , Pearson Education.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II B.TECH. I-SEMESTER **0 – 3 – 2** **ECT2127**

ELECTRICAL TECHNOLOGY LAB
(Common for ECE, EIE & E Cont E)

The following experiments are required to be conducted as compulsory experiments:

1. Magnetization characteristics of D.C. Shunt generator. Determination of critical field resistance.
2. Swinburne's Test on DC shunt machine (Predetermination of efficiency of a given DC Shunt machine working as motor and generator).
3. Brake test on DC shunt motor. Determination of performance characteristics.
4. Speed control of DC shunt motor by
   A. Armature voltage control method.
   B. Field flux control method.
5. OC & SC tests on Single-phase transformer (Predetermination of efficiency and regulation at given power factors and determination of equivalent circuit).
6. By conducting load test on single-phase transformer, determination of regulation and efficiency of given single-phase transformer (with pure resistive load).
7. Brake test on 3-phase Induction motor (performance characteristics).
8. Regulation of alternator by synchronous impedance method.

In addition to the above eight experiments any two of the experiments from the following list are required to be conducted:

9. Load test on DC Shunt Generator. (Determination of load characteristics.)
10. Load test on DC Series Generator. (Determination of load characteristics.)
11. Load test on DC Compound Generator. (Determination of load characteristics.)
12. Brake test on DC Compound motor. (Determination of performance characteristics.)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II B.TECH. I-SEMESTER 0 – 3 – 2 ECT2128

NETWORKS LAB

(Common for ECE, EIE & E Cont E)

The following experiments are required to be conducted as compulsory experiments:

1. Serial and Parallel Resonance – Timing, Resonant frequency, Bandwidth and Q-factor determination for RLC network.
2. Time response for first order RC/RL network for periodic non-sinusoidal inputs – time constant and steady state error determination.
3. Two port network parameters – Z-Y Parameters, chain matrix and analytical verification.
4. Verification of Superposition and Reciprocity theorem.
5. Verification of maximum power transfer theorem. Verification on D.C., verification on AC with Resistive and Reactive loads.
6. Experimental determination of Thevenin's and Norton's equivalent circuits and verification by direct test.
7. Current locus diagram with RL & RC, with R varying in both cases and with C varying.
8. Frequency response of high pass and low pass filters. Computation of bandwidth, cut-off frequencies & analytical verification.

In addition to the above eight experiments any two of the experiments from the following list are required to be conducted:

9. Separation of Self and Mutual Inductance in a Coupled Circuit. Determination of Coefficient of coupling.

10. Harmonic analysis of non-sinusoidal waveform signals using Harmonic Analyzer and plotting Frequency Spectrum.

11. Determination of Form factor for non-sinusoidal waveform, by taking the magnetization current in a transformer as the applied voltage is varied. Experimental determination by measurement of RMS, Average values. Verification from the wave form output.

12. Generation of non-linear periodic waveform for the square wave using clipping and clamping. Control of average value of the output waveform.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II B.TECH. II-SEMESTER **4 – 0 – 4** **ECT2221**

MANAGERIAL ECONOMICS & FINANCIAL ANALYSIS

(Common for all Branches)

UNIT – I: INTRODUCTION TO MANAGERIAL ECONOMICS:
Managerial Economics: Definition, Nature and Scope. Demand analysis: Law of demand, demand determinants. Elasticity of demand: Definition, Types, Measurement and Significance – Demand Forecasting methods.

UNIT – II: THEORY OF PRODUCTION:
Firm and Industry – Production Function – Cobb Douglas Production Function – Laws of Returns – Internal and External Economies of scale.
Cost Analysis: Cost Concepts, Fixed versus Variable Costs, Explicit versus Implicit Costs, Out-of-Pocket Costs versus imputed Costs, Opportunity Costs, Sunk Costs and Abandonment Costs.
Break-even Analysis: Concept of Break-even point (BEP) – Break-even Chart – Determination of BEP in Volume and Value – Assumptions underlying and Practical Significance of BEP. (simple problems).

UNIT – III: INTRODUCTION TO MARKETS AND BUSINESS ORGANIZATIONS:
Market Structures – Types of Competition – Features of perfect Competition, Monopoly, Monopolistic Competition, Price – output determination.
Types of Business Organizations – Features, Merits and Demerits of Sole Proprietorship, Partnership and Joint Stock Companies – Types of Companies – Public Enterprises – Types and Features.

UNIT – IV: INTRODUCTION TO CAPITAL:
Capital and its Significance, Types of Capital, Estimation of Fixed and Working capital Requirements, Methods of raising capital.

Introduction to capital Budgeting methods: Payback method, Accounting Rate of Return (ARR) and Net Present Value (NPV) method. (Simple Problems)

UNIT – V: INTRODUCTION TO FINANCIAL ACCOUNTING AND FINANCIAL ANALYSIS: Double Entry Book Keeping – Journal – Ledger – Trial Balance – Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments.
Ratio Analysis: Computation of Liquidity Ratios (Current Ratio and Quick Ratio), Activity Ratios (Inventory Turnover Ratio and Debtor Turnover Ratio), Capital Structure Ratios (Debit-Equity Ratio and Interest Coverage Ratio) and Profitability Ratios (Gross Profit Ratio, Net Profit Ratio, Operating Ratio, P/E Ratio and EPS). Analysis and Interpretation.

TEXT BOOKS:

1. Joel Dean, Managerial Economics, PHI, 2001.
2. James C. Van Horne, Financial Management Policy, 12th edition 2002, PHI.
3. Varshney and Maheshwari, Managerial Economics, S. Chand & Co., 2000.
4. Y.K. Bhushan, Fundamentals of Business Organization and Management, S. Chand & Co.
5. Narayana Swamy, Financial Accounting, PHI, 2001.
6. A.R. Aryasri, Managerial Economics and Financial Analysis for JNTU (B.Tech), TMH, New Delhi.
7. R.K. Mishra et al, Readings in Accounting and Finance.
8. R.L. Gupta, Financial Accounting, Vol-I, S. Chand, New Delhi, 2001.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II B.TECH. II-SEMESTER **4 – 0 – 4** **ECT2222**

MATHEMATICS – III

(Common for ECE, EEE, EIE, E.Cont.E, ME, PT, MetE)

UNIT – I:

Special functions : Gamma and Beta functions – Their properties – evaluation of improper integrals. Bessel functions – Properties – Recurrence relations – Orthogonality. Legendre polynomials – properties – Rodrigue's formula – Recurrence relations – Orthogonality.

UNIT – II:

Functions of a Complex variable – Continuity – Differentiability – Analyticity – Properties – Cauchy-Riemann equations in Cartesian and polar coordinates. Harmonic and conjugate harmonic functions – Milne - Thompson method.

Elementary functions: Exponential, trigonometric, hyperbolic functions and their properties – General power z^c, (c is complex) Principal value.

UNIT – III:

Complex integration : Line integral – evaluation along a path and by indefinite integration – Cauchy's integral theorem – Cauchy's integral formula – Generalized integral formula. Zero – singular point – Isolated singular point – pole of order m – essential singularity.

Complex Power series : Radius of convergence – Expansion in Taylor's series, Maclaurin's series and Laurent series.

UNIT – IV:

Residue – Evaluation of residue by formula and by Laurent series Residue theorem. Evaluation of integrals of the type

a). Improper real integral $\int_{-\infty}^{\infty} f(x)\,dx$

b). $\int_{\alpha}^{\alpha+2\pi} f(\cos\theta, \sin\theta)\,d\theta$

c). Fourier integrals $\int_{-\infty}^{\infty} e^{imx} f(x)\,dx$

d). Integrals by indentation.

Argument principle – Rouche's theorem – determination of number of zeros of complex polynomials. Fundamental theorem of Algebra, Liouville's Theorem.

UNIT – V:

Conformal mapping: Transformation by e^z, ln z, $z^2 m^1$, z^n (n a positive integer) sin z , cos z , z + a/z.

Translation, rotation, inversion and bilinear transformation – fixed point – cross ratio – properties – invariance of circles and cross ratio – Determination of bilinear transformation mapping 3 given points.

TEXT BOOKS:

1. A Text Book of Engineering Mathematics Volume – III, 2002
1. T.K.V.Iyengar, B. Krishna Gandhi and others, S. Chand and Company
2. Engineering Mathemtics

B.V. Ramana, Tata McGraw-Hill, 2002

3. Engineering Mathemtics – III, 2002
   C.Sankaraiah, Vijaya Publications
4. Engineering Mathematics – III, 2002
   P.Nageswara Rao, Y. Narsimhulu, Prabhakar Rao

REFERENCES:

1. Advanced Engineering Mathematics (Eighth edition)
   Erwin Kreyszig John Wiley & Sons (ASIA) Pvt. Ltd. 2001
2. Advanced Engineering Mathematics (Second edition)
   Michael D. Green Berg , Prentice Hall, Upper saddal River, New Jersey, 1998
3 Sarveswara Rao Koneru.
   Engineering Mathematics, Orient Longman (Pvt.) Ltd. 2002
4 Engineering Mathematics – III.
   N.P.Bali, Laxmi Publications (P) Ltd., New Delhi.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II B.TECH. II-SEMESTER **4 – 0 – 4** **ECT2223**

ELECTRICAL & ELECTRONIC MEASUREMENTS

UNIT-I: ELECTRICAL INSTRUMENTS

Suspension galvanometer, torque and deflection of galvanometer, permanent magnet moving coil mechanism , DC ammeters ,DC voltmeters , Voltmeters, Voltmeter sensitivity series and shunt type ohmmeters, multimeter, alternating current indicating indicating instruments, thermo instruments , electro dynamometers in power measurements , watt hour meter power factor meters, instrument transformers.

UNIT-II: ELECTRONIC INSTRUMENTS

FET input volt-ohm-ammeters A.C.milli voltmeters, True RMS voltmeters Digital volt-ohm-ammeter- Vector impedance meter, phase angle meters digital & analog R.F. power and voltage measurements , Q meter.

UNIT III: OSCILLOSCOPES

Oscilloscope block diagram, cathode ray tube CRT circuits , vertical deflection system , delay line multi trace , horizontal deflection system , oscilloscopes probe special: storage oscilloscope, sampling oscilloscope, digital storage oscilloscope.

UNIT IV: SIGNAL GENERATORS AND ANALYZERS

Sine and square wave audio generators and Radio frequency synthesized signal generators heterodyne wave analyzers , spectrum analyzers , Harmonic distortion analyzers.

UNIT V: FREQUENCY AND TIME MEASUREMENTS:

Basic standards, standard time base generators frequency measurements , time measurements period measurements , measurements errors.

TEXT BOOKS:

1. Electronic Instrumentation & Measurements techniques by W.D. Cooper
2. Electronic measurements by Oliver & Cage(ISE).
3. Transducers & display systems by B.S. Sonde(TMH)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II B.TECH. II-SEMESTER **4 – 0 – 4** **ECT2224**

CONTROL SYSTEMS

(Common for ECE, EEE, EIE, E.Cont.E)

UNIT-I: INTRODUCTION

Concepts of Control systems – Open Loop and closed loop control systems and their differences – Different examples of control systems – Classification of Control systems.

MATHEMATICAL MODELS OF PHYSICAL SYSTEMS

Differential equations – transfer function and block diagram representation of systems considering electrical systems as examples, Block diagram and reduction using algebra – Representation by Signal flow graph - reduction using Mason's gain formula – transnational and rotational mechanical systems.

UNIT-II: FEEDBACK CHARACTERISTICS OF CONTROL SYSTEMS

What is a Feedback? – Effects of feedback - reduction of parameter variations by use of feedback - Control over system dynamics - by the use of feedback - PID controller.

TRANSFER FUNCTIONS OF ELEMENTS OF CONTROL SYSTEMS

Dc Servo motor- AC Servo motor- Synchro Transmitter and Receiver.

UNIT-III: TIME RESPONSE ANALYSIS

Standard test signals – Time response of first order systems – Characteristics Equation of Feedback control systems, Transient Response of second order systems – Time domain specifications – Steady State response – Steady State errors and error constants – Effects of proportional derivative, proportional integral systems.

CONCEPTS OF STABILITY

The concept of stability, Routh stability criterion – qualitative stability and conditional stability.

UNIT – IV: ROOTS LOCUS TECHNIQUES
The root locus concept – construction of root loci – effects of adding poles and zeros to G(s)H(s) on the root loci.
FREQUENCY RESPONSE ANALYSIS
Introduction, Frequency domain specifications – Bode diagrams – Determination of Frequency domain specifications and transfer function from the Bode Diagram – Phase margin and Gain margin - Stability Analysis from Bode Plots.
Polar Plots, Nyquist plots and applications of Nyquist criterion to find the stability – Effects of adding poles and zeros to G(s)H(s) on the shape of the Nyquist diagrams, Constant M and N circle – Nichols Charts – Frequency Domain specifications from Nichols Charts.

UNIT-V
DESIGN AND COMPENSATION TECHNIQUES
Introduction and Preliminary design considerations – Lead, Lag, Lead-Lag – Compensation Based on frequency response approach.

STATE SPACE ANALYSIS OF CONTINUOUS SYSTEMS
Concepts of state, state variables and state model, derivation of state models from block diagrams, Diagonalisation - solving the time invariant state equations – State Transition Matrix.

TEXT BOOKS:

1. Control Systems Engineering – by I. J . Nagrath and M. Gopal New Age International (P) Limited, Publishers, 2nd Edition.
2. Modern Control Engineering – by Katsuhiko Ogata, Prentice Hall of India Pvt. Ltd., 3rd Edition, 1998.
3. Automatic Control Systems – by B.C. Kuo, Prentice Hall of India Pvt. Ltd., 7th Edition, 1997.
4. Control System Engineering - by NISE, 3rd Edition, John Wiley.

REFERENCES :

1. Control Systems by N.K. Sinha, New Age International (P) Limited Publishers, 3rd Edition, 1998.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II B.TECH. II-SEMESTER **4 – 0 – 4** **ECT2225**

PULSE & DIGITAL CIRCUITS
(Common for ECE, EEE, EIE, E.Cont.E)

UNIT – I: LINEAR WAVESHAPING:
High pass and low pass RC circuits and their responses for sinusoidal, step voltage, pulse, square wave and ramp inputs. High pass RC network as a differentiator. Low pass RC network as an integrator. Attenuators and their applications in CRO probe. RL and RLC circuits and their response for step input, Ringing circuits.

UNIT – II: NON-LINEAR WAVE SHAPING:
Diode clippers, Transistor clippers, clipping at two independent levels, Emitter coupled clipper, Diode comparators, Diode differentiator.
Comparator, applications of voltage comparators, clamping operation, clamping circuits using Diodes with different inputs, clamping circuit theorem, practical clamping circuits, effect of Diode characteristics on clamping voltage.
SWITCHING CHARACTERISTICS OF DEVICES:
Diode as a switch, piecewise linear Diode characteristics, Transistor as a switch, breakdown voltage consideration of transistors, saturation parameters of transistors and their variation with temperature. Design of a transistor switch, Transistor switching times.

UNIT – III: MULTIVIBRATORS:
Bistable, Monostable and Astable multivibrators using Transistors, Schmitt trigger.

UNIT – IV: SWEEP CIRCUITS:
Voltage sweeps, methods of linearization, Bootstrap and Miller circuits, Linear current sweep, application in T.V. , synchronization.

SYNCHRONISATION AND FREQUENCY DIVISION:
Principles of Synchronization, Synchronization of Astable multivibrators – Phase Delay and Pulse jitters – Synchronization of sweep circuits with Symmetrical signals.

UNIT – V: GATES:
Unidirectional and Bi-directional Sampling gates.
BLOCKING OSCILLATORS:
Base timing, Emitter timing, Astable blocking Oscillator.

TEXT BOOKS:

1. Pulse, Digital and Switching Waveforms – Millman & Taub, McGraw-Hill Publ.

REFERENCES:

1. Wave Generation and Shaping – by L. Strauss.
2. Pulse, Digital Circuits and Computer Fundamentals – by R. Venkataraman.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II B.TECH. II-SEMESTER **4 – 0 – 4** **ECT2226**

TRANSDUCERS IN INSTRUMENTATION

UNIT I:
Block diagram of instrumentation system, classification of transducers
Performance characteristics of instruments : static
Characteristics –static calibration. Accuracy, precision, error in overall system. Static sensitivity, linearity, threshold, resolution, Hysteresis, dead space, span and range.

UNIT II:
Dynamic characteristics- generalized mathematical model of measurements systems, operational and sinusoidal transfer function , zero, First and second order instruments and their response to step, ramp
And impulse inputs. Loading effects under dynamic conditions.

UNIT III: RESISTIVE TRANSDUCERS
Potentiometers, strain gauges and their types resistance thermometers-RTDS, themistors, Hot wire anemometers.

UNIT IV: INDUCTIVE TRANSDUCERS
Transformer types, electromagnetic types, Magnetostrictive variable remannacne & variable permeability.

UNIT V: CAPACITIVE TRANSDUCERS
Variable dielectric , variable gap, variable area types.

UNIT VI: PIEZO ELECTRIC TRANSDUCERS
Piezo electric effects, piezo resistive effects, peizo electric materials.

UNIT VII: FORCE BALANCE & FORCE SUMMING
The force balance principle, electrodynamics acceleration transducer, electrostatic pressure transducer etc.

UNIT VIII: THERMAL & RADIATION TR ASDUCE RS
Thermal expansion transducers-thermometers, bimetallic strips.

Thermoelectric sensors thermocouples- laws and their reference junction considerations, optical pyrometers two, colour radiation pyrometers. Photo sensors (Photodiode phototransistor infrared LEDs)

TEXT BOOKS:

1. Herman K.P. Neubert "Instrument Tranducers- An introduction to their performance and design " Oxford University press.
2. E.O Doeblin " Measurments system: Applications and Design " M.C.Graw Hill Publication.
3. B.C.Nakra & K.K. Chowadary " Instrumentation Measurement Technology" Jhon wiley & Sons publishers.
4. Curits D.Jhonson "Process control Instrumentation Technology" Jhon wiley & Sons publishers

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II B.TECH. II-SEMESTER **0 – 3 – 2** **ECT2227**

PULSE & DIGITAL CIRCUITS LAB

(Common for ECE, EIE, E.Cont.E)

1. Linear wave shaping.
2. Non Linear wave shaping – Clippers.
3. Non Linear wave shaping – Clampers.
4. Transistor as a switch.
5. Study of Logic Gates & some applications.
6. Study of Flip-Flops & some applications.
7. Sampling Gates.
8. Astable Multivibrator.
9. Monostable Multivibrator.
10. Bistable Multivibrator.
11. Schmitt Trigger.
12. UJT Relaxation Oscillator.
13. Bootstrap sweep circuit.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

II B.TECH. II-SEMESTER **0 – 3 – 2** **ECT2228**

INSTRUMENTATION LAB-I

(Minimum 10 experiments should be conducted)

1. DC meters using D' Arsonvol Galvanometers
2. AC meters using D' Arsonvol Galvanometers
3. ohm meter
4. RLC & Q measurement using Q-meter
5. Study of CRO-Voltage, frequency and phase measurement
6. Strainguages
7. Resistance Thermometer devices
8. LVDT
9. Capacitive transducers
10. Piezo-Electric Transducers
11. Bordon tube
12. Acceleration transducer

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

III B.TECH. I-SEMESTER **4 – 0 – 4** **ECT3121**

MANAGEMENT SCIENCE

(Common for all Branches)

UNIT – I: INTRODUCTION TO MANAGEMENT
Concept of Management and Organization – Functions of Management, Evolution of Management Thought – Taylor's Scientific Management, Fayol's Principles of Management, Douglas Mc-Gregor's Theory X and Theory Y, Mayo's Hawthorne Experiments, Hertzberg's Two Factor theory of Motivation, Maslow's Hierarchy of Human needs – Systematic Approach to Management. Principles of Organization – Types of Organization – Types of Organization Structure: Line Organization, Functional Organization and Line and Staff Organization, Matrix Organization - Managerial objectives – social responsibilities.

UNIT – II: INTRODUCTION TO OPERATING MANAGEMENT
Types of plant Layout- Methods of Production: Job, Batch and Mass Production.
Work-Study: Basic procedure involved in Method study and Work Measurement. Statistical quality control. Materials Management - Objectives of Inventory Control – EOQ – ABC analysis- Purchase procedure - Stores Management and Stores Records.
Marketing: Marketing Vs Selling, Marketing Mix, Stages in Product Life Cycle, Channels of Distribution.

UNIT– III: INTRODUCTION TO HUMAN RESOURCE MANAGEMENT (HRM)
The concepts of HRM, Human Resource Development (HRD) and Personnel Management & Industrial Relations (PMIR) - HRM Vs PMIR, Basic functions of HR Manager: Manpower Planning, Recruitment, Selection, training, development, placement, wage and salary administration, promotion, transfer, separation, performance appraisal, grievance handling and welfare administration, job evaluation and Merit reading.

UNIT – IV: INTRODUCTION TO STRATEGIC MANAGEMENT
Corporate Planning Process: Mission, goals, objectives, policy, strategy, programs - Elements of Corporate Planning Process - Environmental Scanning: External Environment Analysis, Internal Environment Analysis, SWOT Analysis- Stages in Strategy Formulation and Implementation.

UNIT – V: INTRODUCTION TO PERT/CPM
Network Analysis- project management – Program Evaluation and Review Technique (PERT) Vs. Critical Path Method (CPM) – Identifying Critical Path – Probability of completing the project within given time under PERT, Project cost Analysis, Project crashing.

TEXT BOOKS:

1. Koontz and O' Donnel, Principles of Management, McGraw-Hill Publ., 2001.
2. Philip Kotler, Marketing Management, PHI, 2/e.
3. Gary Dessler, Human Resource Management, PEA, 2002.
4. L.S. Srinath, PERT/CPM, Affiliated East-West Press, New Delhi, 2000.
5. W. Glueck & L.R. Jauch, Business Policy and Strategic Management, McGraw-Hill, 1998.
6. A.R. Aryasri, Management Science for JNTU (B.Tech), TMH, 2002.
7. O.P. Khanna, Industrial Engineering and Management, Dhanpat Rai, 1999.
8. Chandra Bose, Management and Administration, Prentice Hall, 2002.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

III B.TECH. I-SEMESTER **4 – 0 – 4** **ECT3122**

COMPUTER OPERATING SYSTEMS

UNIT – I:
Computer System & Operating System Overview: Overview of Computer System hardware – Instruction execution- I/O function – Interrupts – Memory hierarchy – I/O Communication Techniques. Operating Systems – Objectives and functions, evaluation of operating systems – Example systems.
Process description and Control: Process states – process description – process control – processes and Threads – Examples of process description and control.

UNTI – II:
Memory management: Memory Management requirements – loading programs into main memory – virtual memory – hardware and control structures – OS software – Examples of memory management.

UNIT – III:
Uniprocessor Scheduling: Types of scheduling – Scheduling algorithms – I/O Management and disk scheduling, I/O devices, Organization of I/O functions, OS design issues, I/O buffering, Disk I/O, disk scheduling policies - example systems.

UNIT – IV:
Concurrency: Principles of Concurrency – Mutual exclusion – software and hardware approaches – semaphores – monitors – Message passing – Readers/Writers problem. Principles of deadlock – deadlock prevention, detection and avoidance – dining philosopher's problem – Example systems.

UNIT – V:
File management and Security: Overview of file management – file organization and access – file directories – file sharing – Record blocking – secondary storage management – Example system.
Security: Security Threads – Protection – intruders – Viruses – Trusted systems.

TEXT BOOKS:

1. William Stallings: Operating Systems, PHI Second Edition, 1997.

REFERENCES:

1. Understanding Operating Systems – by Ida M. Flynn and Ann McIver McHoes, Thomson Learning.
2. Operating Systems – by Charles Crowing, TME.
3. Operating System Concepts – by Silberschatz and Galvin, John Wiley.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

III B.TECH. I-SEMESTER **4 – 0 – 4** **ECT3123**

COMMUNICATION ENGINEERING
(Common for EIE, E Cont E, BME)

UNIT – I: MODULATION

Amplitude modulation and demodulation: AM, DSB-SC, SSB and VSB

ANGLE MODUALTION AND DEMODULATION

FM and PM, NBFM, WBFM, Pre-emphasis, De-emphasis.

UNIT – II: RADIO TRANSMITTERS

Frequency allocation of radio communication systems, broadcast standards for AM and FM.

Transmitters: Block diagram and functions of radio transmitters, AM, FM and PM.

UNIT-III: RADIO RECEIVERS

TRF and super hetrodyne receivers, RF, mixer and IF stages, choice of IF. Image frequency, alignment and tracking of radio receives. AGC, tone and volume controls. Receiver measurements, Communication receiver. FM receivers. Fading and diversity reception.

UNIT-IV: PULSE MODULATION SYSTEMS

Sampling theorem_statement and proof, types of sampling, TDM and FDM, principles of PAM, PWM and PPM methods. PCM, DM, ADM Introduction to Binary, M-ary,ASK, FSK, PSK, DPSK AND Q-PSK methods.

UNIT V: DATA TRANSFER TECHNIQUES

Asynchronous, synchronous, serial and parallel interface standards, communication media and adapters. Modems and

their interfacing. Computer communication-Introduction to circuit switching, Message switching, and packet switching networks.

UNIT VI: NOISE

Sources and types of noise. Noise power spectral density, SNR, Noise figure.

REFERENCES

1. Electronic and Radio Engineering : Terman
2. Electronic Communication Systems: Kennedy
3. Communication Systems : Lathi
4. Radio Engineering : G.Kmithal
5. Communication Systems : Haykin
6. Data and Computer Communication : William Stallings
7. Electronic Communications : Robert J.Schoenbeck

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

III B.TECH. I-SEMESTER **4 – 0 – 4** **ECT3124**

OPERATIONS RESEARCH

UNIT-I: Development –Definition –Characteristics and phases-Scientific method-
Types of models-General methods for solving operational research models

Allocation –Linear programming problem formulation-Graphical solution – Simplex method-artificial variables technique- Quality Principles

UNIT II: Transportation problem- formulation Optimal solution, un-balanced transportation problem-Degeneracy . Assignment problem – formulation- optimal solution – variations i.e. non-square(mxn) Matrix.

Sequencing : introduction: Optimal solution fro processing 'n' jobs through to machines and 'n' jobs through three machines-Processing to jobs through 'm' machines- Traveling sales men problem i.e. shortest acyclic route models

UNIT III: Replacement: Introduction-Replacement of items that deteriorate with time- when money value is not counted and counter-replacement of items that fall completely i.e., group replacements.
Theory of games: Introduction-Minimum (maximum) Criterion and optimal strategy –solution of games with saddle points-rectangular games without saddle points.

UNIT IV: Waiting lines: Introduction – single channel –poisson arrivals, exponential service times, unrestricted queue with infinite population models –single channel, Poisson arrivals, exponential service times with infinite population and restricted queue-multi channel poisson arrivals, exponential service times with infinite population and unrestricted queue.

UNIT V: Inventory: introduction- single item- Deterministic models. Production is instaneous or at a constant rate, shortage and allowed or not allowed and withdrawal from stroke is continuous- purchase – inventory models with one price break, and mul6tiple price breaks, shortage are not allowed-Stochastic models, demand must be discrete variable or continuous variable, instantaneous production, instantaneous demand and no set up

Dynamic programming :Introduction- Beilman's principles of optimality- Solution of problems with finite number of stages

REFERENCE BOOKS:

1. Operation Research :Methods and problems by Maurice Sasieni, Arthur Yaspan and Lawrence
2. Operation Research by Taha
3. Operation Research by Wagner

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

III B.TECH. I-SEMESTER **4 – 0 – 4** **ECT3125**

LINEAR AND DIGITAL I.C. APPLICATIONS

(Common for ECE, EIE, E.Cont.E, EEE, BME, Mechatronics)

UNIT – I: OPERATIONAL AMPLIFIERS

Design aspects of Monolithic Opamps, Ideal characteristics, Specifications, Offset Voltages and currents, frequency compensation techniques, measurement of op amp parameters, applications of op amps – inverting, non-inverting amplifiers, integrators, function generators, logarithmic amplifiers, instrumentation amplifiers, single conditioning circuits, detectors.

UNIT – II:

555 Timer, 556 Function generator Ics and their applications. Three terminal regulators. IC 565 phase locked loops and their typical applications. IC 1496 (Balanced Modulator).

UNIT – III: ACTIVE FILTERS

LPF, HPF, BPF, BRF, ALL Pass filters, and Higher order filters and their design. VCSV and IGMF configurations.

UNIT – IV: LOGIC FAMILIES

DTL, TTL, ECL, HTL, MOS Logic families, Parameters and their comparison, Tristate logic, Interfacing of Logic Families. Flip-Flop.

UNIT – V:

Analog multiplexers, Sample and hold circuits, D/A converters – Resistive divider and ladder networks, A/D converters, counters – Ramp type, Dual slope, Integration technique, Successive approximation, Parallel comparison technique.

REFERENCE BOOKS:

1. Micro Electronics – by Jacob Millman (ISE).
2. Op amps and Linear Integrated Circuits – by Ramakanth Gayakward (PHI).
3. Integrated Circuits – Botkar (Khanna).
4. Applications of Linear Integrated Circuits – Clayton.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

III B.TECH. I-SEMESTER **4 – 0 – 4** **ECT3126**

PROCESS CONTROL

UNIT – I: INTRODUCTION TO PROCESS CONTROL
Definition-Elements of process control-Process variables-degree of freedom- Characteristics of liquid system, gas system and thermal system- Mathematical model of liquid process , gas process, thermal process- Batch process and continuous process- Self regulation.
BASIC CONTROL ACTIONS
Characteristics of ON-OFF, proportional , integral, derivative control modes- composite control modes –PI, PC and PIO modes- two position control- Single speed floating control – Zieoler Nichols method.

UNIT – II: MEASURING ELEMENTS
Types of measuring means –Temperature elements-liquid level measurements –fluid flow measurements –pneumatic transmission- electric transmission –first order and second order response to measuring elements.
CONTROLLING ELEMENTS
Self operated controllers –pneumatic proportional controllers (displacement and force type)- Air supply for pneumatic systems-Hydraulic controllers –Electrical proportional controllers-Electronic proportional controllers- Theory of automatic controllers circuits.

UNIT – III: FEED FORWARD CONTROL Radio control systems – Dynamic compensatory- adding feedback-principle areas of feed forward control Economic considerations.
CASCADE CONTROL
Properties of inner loop , External feedback –Tuning cascade controllers , Final Control Elements: Pneumatic actuators – Electro-pneumatic actuators –Hydraulic actuators –Electric motor actuators –Two position motor actuators –Sliding steam control valves- Rotating shaft control valves-control valve sizing.

APPLICATIONS OF PROCESS CONTROL:
UNIT – IV: ENERGY TRANSFER AND CONVERSATION
Heat transfer-heat exchangers without phase change-B oiling liquids and condensing vapors-combustion control of fuel and air –fired heaters –steam plant control systems –drum level control-drum pressure control- steam temperature control. Controlling Chemical reactions: Principles of governing the conduct of reactions-chemical equilibrium-reaction rate-Stability of exothermic reactors – continuous reactors-apporting reactant flows- temperature control-maximizing procedure- controlling conversion.

UNIT – V: MASS TRANSFER OPERATIONS
Modeling the process- relative gain analysis-configuring the controls composition –Feedback pressure control methods – controlling at constraint s – side steam columns material – balance control –vapor compression – Evaporation \barometric condensers – rate of drying inferential controls-optimum air flow. Nuclear power plant & Operations.

REFERENCES:

1. Automatic Process Control- Donal.P.Eckman(Willeyn Eastern)
2.
3. Process Control Systems –F.G Shirskey (Mc Graw Hill)
4. Process Control- Peter Harriot for units (T.M.H)
5. Process Instruments & Control Hands Book- Considine, D,M.(Mc Graw Hill)
6. Instrument Engineering Hand Book- Liptak & Venezel(Chilton Randor)

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

III B.TECH. I-SEMESTER **0 – 3 – 2** **ECT3127**

IC APPLICATIONS LABORATORY

(Common for EIE, ECE, Econt.E, Mechotronics)
(Minimum 10 experiments should be conducted)

1. Integrator and differentiator using 741 OPAMP.
2. A) Astable using 555.
   B) Monostable using 555.
3. Function generator using 741 OPAMP.
4. Voltage regulator using 723.
5. Inverter Transfer Characteristics and study of logic gates.
6. Study of flip-flops using IC's.
7. 7490 Counter.
8. Half Adder, Full Adder and subtractor.
9. BCD to 7 segment decoder using IC 7447.
10. Three Terminal regulators 7805, 7809, 7912,565 PLL, 566 PLL, 566 VCO.
11. D/A Converter.
12. A/D Converter.
13. Study of PLAS.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
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III B.TECH. I-SEMESTER **0 – 3 – 2** **ECT3128**

CONTROL SYSTEM LABORATORY –I

(Minimum Ten experiments should be performed)

1. Characteristics of synchro tranducer, Synchro receiver and control transformers
2. gain control of the output of D.C. Amplifier with and without chopper stabilization.
3. Programming a P.L.C
4. Torque- displacement characteristics of stepper motor using A\D converters.
5. Open loop control of a relay servomechanism (On- off control of a temp in a heater bath)
6. Advantage of feedback on the performance of an open loop speed control system (D.C. Motor speed control system)
7. Response of a first order system, with R.C Components (Simulated transfer function) on X-Y plotter/ Servo scope.
8. Operation of pneumatically operated pressure control system using pressure sensitive bellows and LVDT as sensors.
9. Error comparators- gauged potentiometer and systems potentiometer- sensitivity determination.
10. Calibration of a torque- balance pressure control system using a flapper nozzle in the pressure sensing circuit.
11. Modeling of a distillation column as a lumped parameter multi variable system.
12. Pneumatically operated PID controller, with independent gain control of P.I, and D control loops, of a step input response.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

III B.TECH. II-SEMESTER **4 – 0 – 4** **ECT3221**

COMPUTER NETWORKS

(Common for ECE, EIE, E.Cont.E, EEE, CSE, IT)

UNIT-I:
Review of protocol layering, Data link layer, Design issues, Elementary data link protocols, Sliding window protocol, Example data link protocols.

UNIT-II:
The medium access sublayer, Channel allocation problem, Multiple access protocols, Review of IEEE standards for LANs, LAN bridges.

UNIT-III:
The network layer, Design issues, Routing algorithms, Congestion control algorithms, The Transport layer, Transport services, Transport protocols.

UNIT-IV:
Internetworking, Internet network layer, Internet transport protocols (TCP and UDP), ATM network layer, ATM transport protocols.

UNIT-V:
The application layer, Security, DNS, SNMP, Electronic Mail, WWW, Multimedia.

TEXT BOOK:
1. Computer Networks: A. S. Tanenbaum, 3rd Edition, PHI.

REFERENCES:
1. An Engineering Approach to Computer Networking, S. Keshav, Pearson Education.
2. Computer Networking a Top-Down Approach Featuring the Internet, J. F. Kurose, K. W. Ross, Pearson Education.
3. Data Communications and Networking, A. S. Godbole, TMH.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

III B.TECH. II-SEMESTER **4 – 0 – 4** **ECT3222**

MICROPROCESSORS & MICROCONTROLLEOR

UNIT – I:
Evolution of Microprocessors, Architecture of 8086, Register set of 8086, Special functions of general purpose registers, Flag register and function of each flag.

UNIT – II
Addressing modes of 8086, Instruction set of 8086, Assembler directives, Simple assembly language programming of 8086 involving looping, picking maximum and minimum, sorting, and evaluation of arithmetic expression.

UNTI – III:
Pin diagram of 8086, Minimum mode and Maximum mode of operation, Timing diagram, Parallel data transfer schemes, Programmed I/O, Interrupt driven I/O, DMA. 8255 PPI, various modes of operations and interfacing to 8086. A/D, D/A converter interfacing. Simple programs using A/D, D/A converters. Stepper motor interfacing.

Need for serial I/O 8251 USART architecture and programming features, Interfacing to 8086, TTL – to – RS232C, RS232C-to-TTL conversion. Need for DMA, 8237 DMA controller architecture and programming features, Interfacing to 8086.

UNIT – IV:
Interrupt structure of 8086, Vector Interrupt table, 8259 PICU architecture, Programming features and interfacing, Memory interfacing (static RAM only) – Types of EPROMS & SRAM, 74LS138 decoder, Interfacing EPROMS and SRAMS.

UNIT – V:
8051 Microcontroller Architecture, Register set of 8051, Modes of timer operation, Serial port operation, Interrupt structure of 8051, Memory and I/O interfacing of 8051.

TEXT BOOKS:

1. A.K.Ray and K.M Bhurchandi - Advanced Microprocessors & Peripherals, TMH.
2. Douglas V. Hall – Microprocessors & Interfacing, 2nd Ed. (TMH).
3. John Uffenbeck - The 8086/8088 Family, PHI.
4. Kenneth J.Ayala - 8051 Microcontroller, (Penram International).

REFERENCES:

1. Microcomputer Systems: The 8086/8088 Family Architecture, Programming and Design – by Yu Cheng Liu and Glenn A. Gibson, 2/e, PHI.

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III B.TECH. II-SEMESTER 4 – 0 – 4 ECT3223

DIGITAL SIGNAL PROCESSING

(Common for ECE, EIE, E.Cont.E, EEE, BME)

UNIT – I:

Introduction to Digital Signal Processing: Discrete time signals & sequences, linear shift invariant systems, stability, causality. Linear constant coefficient difference equations. Frequency domain representation of discrete time signals and systems.

UNIT – II:

Discrete Fourier series: Properties of discrete Fourier series, DFS representation of periodic sequences, Discrete Fourier transforms: Properties of DFT, linear convolution of sequences using DFT. Computation of DFT: Fast Fourier transforms (FFT) - Radix-2 decimation in time and decimation in frequency FFT Algorithms, Inverse FFT.

UNIT – III:

Applications of z-transforms, solution of difference equations of digital filters. System function, stability criterion, frequency response of stable systems. Realization of digital filters – direct, canonic, cascade and parallel forms.

UNIT – IV:

IIR DIGITAL FILTERS: Analog filters approximations – Butterworth and Chebyshev. Design of IIR Digital filters from analog filters, Bilinear transformation method, step and impulse invariance techniques, Spectral transformations.

UNIT – V:

FIR DIGITAL FILTERS: Characteristics of FIR Digital Filters, frequency response. Design of FIR Digital Filters using Window Techniques. Comparison of IIR & FIR filters.

Applications of FFT in spectral analysis and filtering. Applications of DSP to speech processing and Radar signal processing.

TEXT BOOKS:

1. Digital Signal Processing – by A.V. Oppenheim and R.W. Schaffer, PHI.
2. Digital Filter Analysis and Design – by A. Antoniou, TMH.

REFERENCES:

1. Digital Signal Processing – by W.D. Stanley et.al. Resin Publ.
2. Digital Signal Processing – by S. Salivahanan et al., TMH.
3. Digital Signal Processing – by Thomas J. Cavicchi, WSE, John Wiley

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

III B.TECH. II-SEMESTER **4 – 0 – 4** **ECT3224**

COMPUTER ORGANISATION

(Common for ECE, EIE, E.Cont.E, CSE, IT)

UNIT I:

Concept of Von Newmann Machine, components in a computer, functions of various of components, bus structure, arithmetic logic unit, computer arithmetic: addition/subtraction of integers, multiplication and division of integers; floating point arithmetic operations, BCD arithmetic operations.

UNIT II:

Concept of instruction format and instruction set of a computer, types of operands and operations; addressing modes; processor organization, register organization and stack organization; instruction cycle; basic details of Pentium processor and power PC processor, RISC and CISC instruction set.

UNIT III:

Memory devices: Semiconductor and ferrite core memory, main memory, cache memory, associative memory organization; concept of virtual memory; memory organization and mapping; partitioning, demand paging, segmentation; magnetic disk organization, introduction to magnetic tape and CDROM.

UNIT IV:

IO Devices: Programmed IO, interrupt driver IO, DMA, IO modules, IO addressing; IO channel, IO Processor, Dot matrix printer, ink jet printer, laser printer.

UNIT V:

Advanced concepts: Horizontal and vertical instruction format, microprogramming, microinstruction sequencing and control; instruction pipeline; parallel processing; problems in parallel processing; data hazard, control hazard.

TEXT BOOKS:

1. Williams Stallings, Computer Organization and Architecture, PHI, 1998.
2. Carl Hamachar, Zvonko Vranesic and Safwat Zaky, Computer Organization McGraw Hill International Edition.
3. G. V. Anjaneyulu, Computer Organization, Himalaya Publishing House.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

III B.TECH. II-SEMESTER **4 – 0 – 4** **ECT3225**

ROBOTICS AND AUTOMATION

(common for ECE, EIE, E.cont.E. B.M.E.)

UNIT I: BASIC CONCEPTS

Definition and origin of robotics-different types of robots – various generations of robots- degree of freedom- Asimov's laws of robotics- Dynamic stabilization

of robots.

UNIT II: POWER SOURCES AND SENSORS

Hydraulic, pneumatic and electric drivers – determination of HP of motor and gearing ratio- variable speed arrangements – path determination – machine vision – ranging- laser- acoustic magnetic- fiber optic & tactile sensors.

UNIT III: MANUPLATORS, ACTUATORS AND GRIPPERS

Construction of manipulators – manipulator dynamics and force control- electronic and pneumatic manipulator control circuits-and-effectors-various types of grippers – design considerations.

UNIT IV: KINEMATICS AND PATH PLANNING

Solution of inverse kinematics problem – multiple solution – Jacobian work envelop-hill climbing techniques-robot programming language.

UNIT V: CASE STUDIES

Multiple robots - machine interface – robots in manufacturing and non-manufacturing applications-robot cell design- selection of a robot.

REFERENCES:

1. Mikell P, Weiss G.M., Nagel R.N., Odrey N.G., Indristrial Robotics, McGraw Hill, 1986.

2. Deb.S.R., Robotics Technology and flexible automation, Tata McGraw Hill, 1994.

3. Asfahi C.R., Robots and manufacturing Automation , John wiley, 1992.

4. Klafter R.D., Chimielewski T,A & Neign M., Robotics engineering: An integrated Approach, Prentice Hall of India Ptv.Ltd.,1994.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

III B.TECH. II-SEMESTER **4 – 0 – 4** **ECT3226**

ADVANCED CONTROL SYSTEMS

UNIT I: CONTROLLABILITY AND OBSERVABILITY

Test for continuous time systems for controllability and observbility – Time varying case, minimum energy control , time invariant case, Principle of duality, Controllability and observability from Jordan canonical form and other cononical forms.

STABILITY

Stability in the sense of Lyapunov . Lyapunnov's stability and Lyapunov's instability theorems. Direct method of Lyapunov for the linear continuous time autonomous systems.

UNIT II: MODAL CONTROL

Effects of state feedback on controllability and observability. Pole placement by state feedback. Full order observe and reduced order observer . Dead beat control by state feedback. Dead beat observers.

UNIT III: OPTIMAL CONTROL

Formulation of optimal control problem . Minimum time, Minimum energy , Minimum fuel problems. State regulator problem. Tracking problem. Calculus of variation approach : minimization of functional of single function. Constrained minimization. Minimum principle . Control variable inequality constraints . Control and state variable inequality constraints.

UNIT IV: MULTI VARIABLE THEORY

Transfer between transfer matrix and static space representation-Minimal realization- Controllable realization- Observable realization- Algorithms- Minimal derivation operation(DO) realization- Dynamic feedback compensation in frequency derivative- Design algorithm – Order of the Compensator- Equivalence to linear state variable feedback- Model making compensation- Elementary feedback.

UNIT V: COMPUTER AIDED CONTROL SYSTEM DESIGN

(Use of MATLAB Software package) Introduction , modeling and simulation. Control system analysis and design package. System identification -PC MATLAB based software packages.

BASICS OF MATLAB

Matrices operation and functions, Relational and logic operations. Vector and subscripted control flow constraints. M files and functions. Control systems tool box, Menu interface to PC-MATLAB for computer aided analysis and design.

TEXT BOOKS:

1. Modern Control Theory by M.Gopal, M/s. TMH Publications.
2. Distributed Computer Control Systems by S.S. Lamba and V.P Singh.
3. Linear Multivariable control theory by Y.S. Apte.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

III B.TECH. II-SEMESTER **0 – 3 – 2** **ECT3227**

MICROPROCESSORS LAB

I. MICROPROCESSOR 8086:

1. Introduction to MASM/TASM.
2. Arithmetic operation – Multi byte addition and subtraction, Multiplication and Division – Signed and unsigned Arithmetic operation, ASCII – arithmetic operation.
3. Logic operations – Shift and rotate – Converting packed BCD to unpacked BCD, BCD to ASCII conversion.
4. By using string operation and Instruction prefix: Move Block, Reverse string, Sorting, Inserting, Deleting, Length of the string, String comparison.
5. Modular Programming: Procedure, Near and Far implementation, Recursion.
6. DOS/BIOS programming: Reading keyboard (Buffered with and without echo) – Display characters, Strings.

II. INTERFACING:

1. 8259 – Interrupt Controller.
2. 8279 – Keyboard Display.
3. 8255 – PPI.
4. 8251 – USART.

III. MICROCONTROLLER 8051:

1. Reading and Writing on a parallel port.
2. Timer in different modes.
3. Serial communication implementation.
4. Understanding three memory areas of 00 – FF (Programs using above areas).
5. Using external interrupts.
6. Programs using special instructions like swap, bit/byte, set/reset etc.
7. Programs based on short, page, absolute addressing.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
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III B.TECH. II-SEMESTER **0 – 3 – 2** **ECT3228**

CONTROL SYSTEMS LABORATORY- II
(Minimum Ten experiments should be performed)

1. Determination of the control characteristics of A.C servomotor.
2. Transfer function of armature controlled D.C servomotor with inertia and viscous
3. Control characteristic of a magnetic amplifier with and without feedback.
4. D.C Motor speed control with regenerative and degenerative feedback and with tach generator in the feedback path.
5. D.C position control system –Output control with variation of control loop gain
6. System identification for the frequency response of a filter (based pass + band elimination filter)
7. Shaft angle encoder, decoder, output characteristics.
8. Amplitude modulation of low frequency, Signal and recovery after demodulation (effect of modulating frequency on the signal to noise ratio).
9. Robot manipulator motion control using feed pendent.
10. Pick and plan assignment of robot manipulator with microcontroller.
11. 4-1 line multiplexer with digital logic gates.
12. Elementary fast programming on a robot manipulator (describing a trajectory, which is predefined).

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY
HYDERABAD

IV B.TECH. I-SEMESTER **4 – 0 – 4** **ECT4121**

OBJECT ORIENTED PROGRAMMING THROUGH JAVA
(Common for EIE, E.Cont.E, BME)

UNIT – I:

Introduction to Java – Characteristics of Java – Java applications – Anatomy of application program – Java applets – Application versus applets. Java building elements – identifiers – Data types – Programming style and documentation – control structures – if, nested if, if-else statements – switch statement – Loop structures - for, while and do loops.

Methods – creating a method and calling a method – overloading methods – debugging – recursion.

UNIT – II:

Object oriented programming – Objects and Classes – Passing to objects to methods - instance variables and Class variables – instance methods and class methods – Scope of variables – Packages – Arrays and strings – sorting and searching arrays – array of objects – multi-dimensional arrays – string class – command line arguments. Class inheritance – super class and sub-class – Abstract classes – casting objects – interfaces.

UNIT – III:

Graphics programming – Abstract Window Toolkit (AWT) – Frames – event driven programming – layout managers – graphics classes – user interfaces – interface components – interactive graphical user interface – multiple windows applications.

UNIT – IV:

Applets and advanced graphics – applet class – passing parameters to applets – drawing with mouse – keyboard evens – using layout manager and without layout manager.

UNIT – V:

Exception handling – exceptions and exception types – exception classes – cautions in using exception classes – multi-threading – thread class – thread states and priority – Thread graphs – synchronization. Input and Output streams – Processing external files – Random Access files and Interactive input and output.

TEXT BOOK:

An Introduction to Java Programming – by Y. Daniel Liang, PHI.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV B.TECH. I-SEMESTER **4 – 0 – 4** **ECT4122**

NEURAL NETWORKS AND FUZZY LOGIC CONTROL
(Common for E. cont. E, B.M.E)

UNIT I: INTRODUCTION AND DIFFERENT ARCHITECTURES OF NEURAL NETWORKS

Artificial Neuron – MLP- Back propagation- Hopfield Networks- Kohenen self organizing maps- Adaptive Resonance.

UNIT II: NEURAL NETWORKS FOR CONTROL

Schemes of Neuro- control- Identification& control of Dynamical systems- Case study.

UNIT III: INDRODUCTION TO FUZZY LOGIC

Fuzzy sets – Fuzzy Relations- Fuzzy conditional statements- Fuzzy rules – Fuzzy algorithm Functional diagram.

UNIT IV: FUZZY LOGIC CONTROL SYSTEMS

Fuzzy logic controller- Fuzzification interface- Knowledge base- Decision making logic-

Defuzzification interface –Design of Fuzzy logic controller – Case study.

UNIT V: NEURO- FUZZY LOGIC CONTROL

Adaptive fuzzy systems- Optimization of membership function and rules base of fuzzy logic controller using Neural Networks – fuzzy neuron- Case study.

REFERENCE BOOKS:

1. Klir G.J., and Folger T.A Fuzzy sets, uncertainty and Information, Prentice Hall o India, New Delhi, 1994
2. Simon Hayking, Neural Network, ISA, Research Triangle Parke 1995.
3. Kosco B., Neural Networks and Fuzzy systems: A Dynamical approach to machine intelligence, Prentice Hall, USA, 1992.
4. Hertz J., Korgh A., and Palmer R.G., Introduction to Neural Computation.Addison- Wesley Publishing co., California,1991.
5. Nie & Linkers: Fuzzy Neutral Control: Principles, Algorithms and Applications, PHI, 1998.

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IV B.TECH. I-SEMESTER 4 – 0 – 4 ECT4123

DIGITAL CONTROL SYSTEMS

(Common for E.I.E, E. cont. E)

UNIT I:

Introduction to digital Control Systems, Z- transform technique, initial and final value theorem, solution of different equations using Z-transformer, pulse transfer function.

UNITII II

State space representation of digital systems, solution of discrete time state space equation Controllability and observability, stability tests of digital systems: Jury's stability test and Liapunov stability theorem for linear digital systems.

UNIT III:

Design of digital control systems with digital controllers through bilinear transformation. Digital PID controller ,Design for dead beat response , pole placement design by incomplete feedback or output feedback.

UNIT IV:

Digital state observers - design of full order and reduced order observers- Kalman Filter.

UNIT V:

Principle, design of digital systems: Design of digital control systems by maximum(minimum) principle- linear digital regulator design for finite time and infinite time problems, solution of discrete matrix Riccati equation.

REFERENCES:

1. B.C. KUO HOLT. RINEHART: Digital control systems WIONSTON INC.
2. K.OGATA:Discrete time control systems PRENTICE HALL
3. NAGRATH AND GOPAL: Control systems Engineering WILEY EASTERN
4. M. GOPAL: Digital Control & State variable Methods. TMH.

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IV B.TECH. I-SEMESTER 4 – 0 – 4 ECT4124

ADAPTIVE CONTROL SYSTEMS

UNIT I:
Concept of Adaptive control. Definition, types of adaptivity, essential adaptive of adaptive control Essential ratio of adaptive control, General

UNIT II:
Adjustment of system parameter to maintain specified closed loop pole- zero configuration- Marx system, Osden's system, the system of Anderson, Buland and Cooper. Adjustment of system parameters t satisfy selected error criteria

UNIT III:
Computer controlled adaptive control systems; Karlman's method Corbins method, staffin's method, Merrians methods, Braun's method , method of Mishkin and Hadded.

UNIT IV:
Adaptive control with the gradient method. Adaptive control using Lyaphnov control, pole placement of self tuning regulators.

UNIT V:
Self turning regulators: Regulation and tracking with Minimum. Variance control pole placement of self turning regulators.

REFERENCE BOOKS:

1. Adaptive control systems- Misthkin and Braun- Mc Graw Hill
2. Digital control systems- P.N Paraskevopoules Prentice Hall

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IV B.TECH. I-SEMESTER 4 – 0 – 4 ECT4125

RELIABILITY

UNIT I:

Definition and basic concepts, failure data, failure modes and reliability in terms of hazard rates and failure density function. Hazard models and 'bath- tub' curve. Application of Weibull distribution. Reliability calculations for series , parallel , parallel – series and k-out –of-m systems. Use of reudundancy and system reliability improvements methods.

UNIT II: MAINTAINABILITY

Objectives, types of maintenance, preventive, condition-based and reliability centered maintenance. Tero technology and total productive maintenance(TPM).

UNIT III: MAINTAINABILITY

Definition, basic concepts, relationship between reliability, maintainability and availability: corrective maintenance time distributions and maintainability demonstration. Design considerations , for maintainability.

UNIT IV: DESIGN CONSIDERATIONS FRO MAINTAINABILITY

Introduction to life- testing –estimation of parameters for exponential and Weibell distributions , component reliability and MIL standards.

UNIT V: SAFETY

Causes of failure and unreliability. Human reliability and operator training. Origins of consumerism and importance of product knowledge, product safety , product liability and product safety improvement program.

REFERENCE BOOKS:

1.Balauruswamy E- reliability Engineering

2.Blanchard B S- Maintainability.

3.Sinha and Kale- Introduction to Life Testing Wiley Eastern.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV B.TECH. I-SEMESTER 4 – 0 – 4 ECT4126

DATABASE MANAGEMENT SYSTEMS

UNIT I: INTRODUCTION TO DATABASE SYSTEMS

Overview – file systems verses a DBMS – various data models- levels of abstraction – Structure of a DBMS – Relational model- relations and integrity constraints – relational algebra and calculus- SQL- basic SQL – query- nested queries – aggregate operators – embedded SQL- dynamic SQL- Security, Views and SQL- QBE.

UNIT II: FILE ORGANIZATION

Storage media- buffer management – record and page formats- file organizations- Various kinds of indexes and external sorting.

UNIT III: QUERY OPTIMIZATION AD EVALUATION

Introduction to query processing – Selection operation – Protection operation – join operation- set operation and aggregate operation- relational query optimization- translating SQL queries –mho algebra – estimating the cost- relational algebra equivalences.

UNIT IV: DATABASE DESIGN

Overview of database design –ER model- features of ER model- Conceptual design using ER model. Scheme refinement and normal forms- Schema refinement- Use of decompositions – functional dependencies – normal forms – multi valued dependencies.

UNIT V: CONCURRENCY CONTROL AND RECOVERY

Concepts of transaction – transactions and schedules – Lock based concurrency control- lock management – specialized locking techniques- Concurrency control with out locking- Crash

recovery- introduction to crash recovery- long recovery- Check pointing – media recovery.

TEXT BOOKS:

1. Database Management Systems – by Raghu Rama Krishna, Mc Graw- Hill publishers, 1998

REFERENCE BOOKS:

1. Database Management and design – by G.W. Hansen and J.V. Hansen, prentice- Hall of India. 2nd edition 1999
2. Database System Concepts- by Henry Korth, Abraham Sliberschatz and S. Budarshan , Mc Graw- Hill Companies, 3rd edition, 1997.
3. An Introduction to database systems – by Bipin C Desai , Galgotia publications 1998.

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IV B.TECH. I-SEMESTER 4 – 0 – 4 ECT4127

DISTRIBUTED COMPUTER CONTROL SYSTEMS

(Elective-II)

UNIT I:

Architecture computer control systems – controlled architecture – Distributed control architecture Data highway system.

Distributed computing system: Distributed processing . Digital control system-digital control system – computer control, self tuning and adaptive algorithms .

UNIT II: Supervising control systems, Multi layer hierarchical structure , system decomposition , open loop co-ordination strategies, model reality differences, closed loop co-ordinate strategies, Integrated system, Optimization an parameter estimation(ISOPE) , Double interactive strategies

UNIT III:

Real time control systems: Design techniques and tools – MASCOT , structured development of real time system. Fault tolerance in mixed hardware – software system- Fault detection measures- fault detection mechanism – Damage confinement and assessment.

UNIT IV: Expert system in real time control- Knowledge based process management , Representation of knowledge , reasoning in real time , application of knowledge based systems for process management .

UNIT V: Real time task management , Task scheduling dispatch , Task co- operations and Communications , distributed data, distributed control

TEXT BOOK

1.Distributed Computer Control systems by SS Lamba, Y D Singh. TMH publications new Delhi

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV B.TECH. I-SEMESTER 4 – 0 – 4 ECT4128

INDUSTRIAL ELECTRONICS

(Elective II) (common for ECE, EIE, E.cont .E, M.E, Mechotronics)

UNIT I: DC AMPLIFIERS

DC amplifiers , drift compensation techniques , differential amplifier.

UNIT II: REGULATED POWER SUPPLIES

series and shunt type, protection Techniques, Switching mode voltage regulator , servo voltage stabilizer , monolithic voltage regulator(fixed and variable)

UNIT III: SCR AND THYRISTOR

Principles of operation and characteristics of SCR, Triggering of SCR, Diac and Triac , Communication . thyristor – characteristics –fase controlled half and full wave rectification

UNIT IV: APPLICATIONS OF SCR IN POWER CONTROL

Static circuit breaker , overload protection, inverters , converters and chopper circuit s. other applications of SCR, industrial applications of Triac and Diac.(single phase applications only)

UNIT V: INDUSTRIAL APPLICATIONS

Timing circuits, welding control, Electronic DC motor control, induction and D electric heating. ultrasonic generators and applications

REFERENCES:

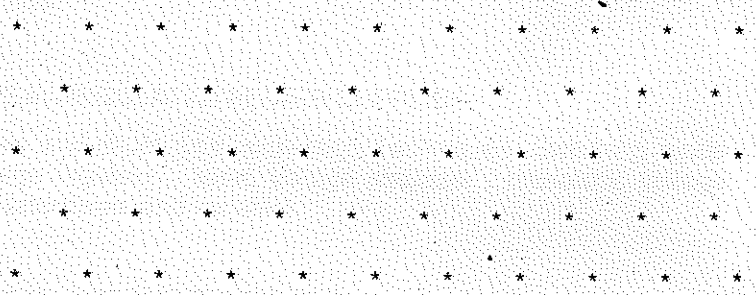
1. Integrated Circuits and semiconductor devices – by Deboo and Durroughs, (ISE).
2. Industrial Electronics – by G K MITHAL, (khanna publications).
3. Thyristors and applications – by M.rammurthy.
4. Integrated electronics – by Milliman and Halikiase, (ISE).
5. Engineering Electronics – by Ryder.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV B.TECH. I-SEMESTER 0 – 3 – 2 . ECT4129

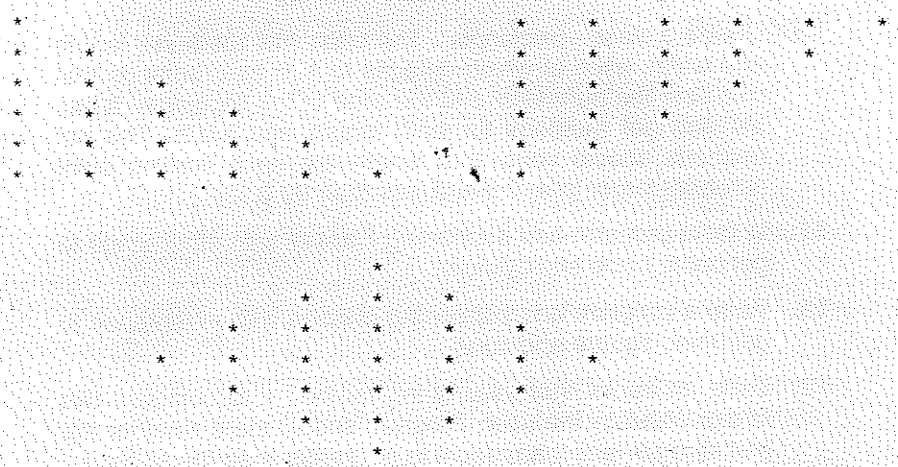
JAVA PROGRAMMING LAB
(Common for E.C.E, E.I.E, E.Cont.E)

1. Write a JAVA program that prints a Box, an Oval, an Arrow and a Diamond using asterisks (*).
2. Write JAVA Applet that displays a check board pattern.



3. Write a JAVA applet that reads in two integers and determines and prints if the first is a multiple of the second.
4. Write an applet that reads in the size of the side of a square and prints a hallow square of that size out of asterisks.
5. A palindrome is a number or text phrase that reads the same backwards as forwards. Write an applet that reads in a five digit integer and determines whether or not it is a palindrome.
6. Write an applet that reads a non-negative integer and computes and prints its factorial.
7. Write an applet that estimates the value of the mathematical constant.
8. Write an applet that computes the value of e^x.

9. Write an application that prints the following patterns



10. Write an applet that inputs integers and passes them one at a time to a method – ISEVEN – which uses the module operator to determine if an integer is even. The method should take an integer argument and return true if the integer is even and false otherwise.
11. Write a method tat takes an integer value and returns the number with its digits reversed. Display the results of the method in the status how.
12. Write a method quality points that inputs a student average and returns 4 if a students average is 90-100, 3 if the average is 80-89, 2 if the average is 70-79, 1 if the average is 60-69 and 0 if the average is lower than 60. Incorporate the method into an applet that reads a value from the user. Display the result of the method in the status bar.
13. Write a method distance that calculates distance between two points (x1,y1) and (x2,y2). Incorporate this method into an applet that enables the user to enter the co-ordinates of the points.
14. Write an applet that uses a method – circle area – to prompt the user for the radius of a circle, and to calculate and print the area of the area of the circle.

15. Write a recursive method – string reverse – that takes a character array containing a string as an argument, prints the string backwards and returns nothing.
16. Create a class – rectangle . The class has attributes length and width, each of which defaults to 1. It has methods that calculate the perimeter and the area of the rectangle. It has set and get methods for both length and width. The set methods should verify that length are each floating point numbers larger than 0.0 and less than 20.0.
17. Write a program and supporting classes with inheritance to get point, circle and cylinder.
18. Write a program and supporting classes with inheritance to get point, square and cube.
19. Write an applet that uses string method – to compare two strings input by the user. Program should state whether the first string is less than, equal to or greater than the second.
20. Write an applet that inputs text and outputs text in uppercase and lower case letters.
21. Write an applet that records a series of strings and outputs only those strings beginning wit the letters "b".
22. Creation of GUI for typical cases.

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IV B.TECH. I-SEMESTER **0 – 3 – 2** **ECT4130**

CONTROL SYSTEMS LABORATORY- III

(Minimum ten experiments should be performed)

1. Plot bode plot measurements frequency domain plots for selected transfer function with MAT LAB- Nyquist of gain and phase margins
2. Plotting root locus for selected transfer function using MATLab.
3. Step function response of a second order system on MATLAB- Control of transient and steady state parameters
4. Obtaining state – space model for a classical transfer function using MATLAB
5. Pole placement for dead beat response of the chosen system(from the state – space model), using MATLAB and state feedback
6. Design of phases lead compensator and phase lag components for the Bode plot
7. Transfer.function of a sample and zero order hold circuit
8. Design a dead beat digital controller for step input for a chosen 2^{nd} order system
9. Model reference adaptor control system, with parameter optimization for a position control system
10. Design of a full order digital observer for the chosen state – space model using state space approach and compute simulation for a chosen system
11. Programming a microprocessor (real time control; for a computer controlled temperature control system for a heater bath)
12. A pc based digital controller for a position control system for prescribed specification

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IV B.TECH. II-SEMESTER 4 – 0 – 4 ECT4221

ARTIFICAL INTELLIGENCE AND EXPERT SYSTEM
(Elective – III)

UNIT I: BASIC PROBLEM SOLVING METHODS

Producing systems – state search – Control strategies – Heuristic search- Forward and back ward – reasoning – Hill Climbing – Breadth first search Depth first search – Staged

Search.

UNIT II: KNOWLEDGE REPRESENTATION

Predicate logic- Resolution question answering – Nonmonotic reasoning- Statistical and probabilistic reasoning – Fuzzy logic – Semantic Nets – Conceptual dependency – Frames – Scripts.

UNIT III: AI APPLICATIONS

Neutral Networks – Natural language understanding- speech recognition and understanding - Learning perception – AI in robots ; satellite imaging and medical diagnosis

UNIT IV: AI LANGUAGES

Important characteristics of AI languages – LISP – PROLOG- Computer architecture for AI applications - Components of an AI program – Programming assignments for the above – AI problems.

UNIT V: INTRODUCTION TO EXPERT SYSTEMS

Structure of an expert system- interaction with an expert Design of an expert system.

REFERENCES BOOKS:

1. Rich E ., and K., Artificial Intelligence . Tata McGraw Hill , New Delhi, 1991.

2. Nilsson N.J., Principles of Artificial Intelligence , Springer Verlag , Berlin, 1980.

3. Barr A., Fergenbaum E.A., and Cohen P.R., Artificial Intelligence . Addison- Wesley, reading(mass), 1989

4. Waterman D.A., A Guide to Expert system, Addison – Wesley , Reading(mass), 1986.

5. Artificial Intelligence Handbook Vol. 1-2, ISA, Research Triangle Parke, 1989,

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TELEMETRY AND TELECONTROL
(common for EIE, and E.Cont E)

UNIT I: TELEMETRY FENDAMENTALS AND CLASSIFICATION

Fundamentals concepts – Significance , Principle, fundemental blocks of Telemetry and Telecontrol system –Methods of telemetry – Electrical , Pneumatic , Hydraulic and optical Telemetry- State of the art – Telemetry standards.

UNIT II: LANDLINE TELEMETRY

Electrical Telemetry – Current systems – Synchro systems- Frequency systems Position and Pulse systems- Example of a landline telemetry system.

UNIT III: RADIO TELEMETRY

Block diagram of a Radio Telemetry System- Transmitting and receiving techniques – AM, FM, PM, Multiplexing and demultiplexing- Transmitting an d receiving – Digital coding methods- Advantage of PCM , PWN, PPM, FSK- Delta modulation- coding and decoding equipment – Example of a radio telemetry system.

UNIT IV: OPTICAL TELEMETRY

Optical fibers for signal transmission- Source for fiber optic transmission – Optical detectors trends in fiber-optic devices development – example of an optical telemetry system.

UNIT V: TELECONTROL METHODS

Analog and Digital technique in telecontrol, telecontrol apparatus – Remote adjustment, Guidance and regulation- Telecontrol using information theory- Example of a telecontrol system

REFERENCES:

1. Gruenbegr L., Handbook of telemetry and remote control, McGraw Hill, New
2. York, 1987.
3. Reinhold Publishing Corp, London, 1991.2. Swoboda G., Telecontrol methods and application of telemetry and remote control,
4. young R.E., telemetry Engineering, Little Books Ltd., London, 1988.
5. Housley T., Data communication and teleprocessing system, Prentice Hall international, Englewood Cliffs, New Jersey, 1987.

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IV B.TECH. II-SEMESTER 4 – 0 – 4 ECT4223

MANAGEMENT INFORMATION SYSTEMS

(Elective – IV)
(Common for ECE, EIE, E Cont E, EEE)

UNIT – I: THE MEANING AND ROLE OF MIS
What is MIS? Decision support systems, systems approach. The systems view of business, MIS organisation with in the company. Management organisational theory and the systems approach. Development of organizational theory, Management and organizational behavior, Management information and the systems approach.

UNIT – II: INFORMATION SYSTEMS FOR DECISION MAKING
Evolution of an information system, Basic information systems, decision making and MIS, MIS as technique for makin programmed decisions, design assisting information systems.
STRATEGIC AND PROJECT PLANNING FOR MIS
General business planning, Appropriate MIS response, MIS planning – General, MIS Planning details.

UNIT – III: CONCEPTUAL SYSTEM DESIGN
Define the problems, Set systems objectives, Establish system constraints, Determine information needs, determine information sources, Develop alternative conceptual designs and select one, Document the system concept, Prepare the conceptual design report.
DETAILED SYSTEM DESIGN
Inform and involve the organization, Arm of detailed design, Project management of MIS detailed design and Trade off criteria, Define the subsystems, Sketch the detailed operating MIS systems and information flows, Determine the degree of automation of each operation, Inform and involve the organization again, Inputs, Outputs and processing, Early system testing, Software, Hardware and Tools, Propose an organization to operate the system, Document the detailed design, Revist the manager – User.

UNIT – IV: INPLEMENTATION, EVALUATION AND MAINTENANCE OF THE MIS
Plan the implementation, Acquire floor apace and plan space layouts organized for implementation, Develop procedures for implementation, Train the operating personnel, Computer related acquisitions, Develop forms for data collection and information dissemination, Develop the files, Test the system, Cut over, Document the system, Evaluate the MIS, Control and maintain the system.

UNIT – V: PITFALLS IN MIS DEVELOPMENT
Fundamental weakness, Soft spots in planning, Design problem, Implementation the TAR PITF.

TEXT BOOKS:

1. Information systems for modern management – by R.G. Murdick, J.B. Russ and J.R. Clagget.
2. Management Information Systems – by W.S. Jawadekar, TMH.

REFERENCES:

1. Management Information Systems – by Brien, Irwin, (TMH).
2. Management Information Systems – by G.B. Dour's and M.H. Olson, McGraw Hill Book Company, 2/e, 1985.
3. Decision Support Systems for Effective Planning and Control – by R.J. Thireramp, PHI, 1982.
4. Management Information Systems – by S. Sadagopan, PHI, 1998.
5. Management with Information – by J. Kanter, PHI, 4/e, 1998.
6. Management Information Systems: Organizational and technology – by K.C. Landon, PHI, 4/e, 1999.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV B.TECH. II-SEMESTER 4 – 0 – 4 ECT4224

COMPUTER AIDED DESIGN OF CONTROL SYSTEMS

(Elective - IV)

UNIT I:

Introduction and mathematical back ground, system models, Generation of system matrices-Least order, Decoupling zeros, mode of the system transformation – Mcmillian form – Reduction to least order- Controllability and observability- Decomposition of the state space- stability.

UNIT II:

SISO Systems: System Specification, Stability- Decoupling zeros , Nyquist Diagram. Inverse Nyquist diagram- Design of phase lead compensators from inverse Nyquist diagram- Design of phase lag compensators from inverse Nyquist diagram.

UNIT III:

Root loci method of design, Comparison with inverse Nyquist diagram techniques – Sensitivity Design criteria , step response – frequency response – pole location – Selection of criteria. Irrational transfer functions, Non minimum phase response. the circle criteria – Connection with the describing function.

UNIT IV:

Multivariable Systems: Notation, Gain space, stability, frequency response criteria for stability, diagonal dominance, Ostrowski's theorem, Achieving dominance, Sensitivity, Direct Nyquist array, design procedure- Multi variable circle criterion.

UNIT V:

Design with MATLAB: Basic of MATLAB: Entering simple matrices, statements, variables, arithmetic expressions, complex numbers and matrix expression, output format, quitting and saving the work space, logical operators, Vectors and subscripts. FOR loops, M files and functions, menu interface to PC-MATLAB, Tool Boxes for control system design, menu driven options, plotting facilities.

REFERENCE:

1. Computer Aided Design of Control Systems – by Resenbrock(Academic Press)
2. Multi variable Control Theory by Y.S. Apte.
3. MATLAB Control System Tool Box.

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