B. N. Mandal University, Laloonagar, Madhepura

Details of theory & Sessional Papers code of 2nd Year B. Tech. Course

BRANCH: COMPUTER SCIENCE & ENGINEERING

Sl No.	Subject	Subject Code	Branch Code	L	T	P	Th. Ext.	Th. Int.	Sessional
01	Mathematics-III	MA-III	CS-201	3	1	0	70	30	--------
02	Numerical Methods & Computational Techniques	NMCT	CS-202	2	1	3	70	30	Numerical Methods & Computational Techniques-50
03	Basic Electronics	BE	CS-203	2	1	3	70	30	Basic Electronics-50
04	System programming and compiler design	SPCD	CS-204	2	1	3	70	30	System programming and compiler design-50
05	Digital Electronics	DE	CS-205	2	1	3	70	30	Digital Electronics-50
06	Object Oriented Programming	OOP	CS-206	2	1	3	70	30	Object Oriented Programming-100
07	Data Structure using C	DS	CS-207	2	1	3	70	30	Data Structure using C-50
08	Computer Architecture	CA	CS-208	3	1	0	70	30	---------
09	Minor Project	MP	CS-209	...	...	3	----	----	Minor Project-50

Expert-I (External) Name: Designation: Address:

Expert-II (Internal) Name: Vivek Kr Designation: HOD Address: Deptt of CSE MIET, Purnea

Dean Faculty of Science & Engineering BNMU, Madhepura

Principal MIT Rambagh purnea

Member Secretary Syllabus committee BNMU Madhepura

Subject: Mathematics-III Branch Code: CS-201 (ECE/CSE/EE/ME/CE/IT)

T-P: 3-1-0

First Term

1. **Ordinary differential equations & special functions:** Series solution of different equations [illegible] Bessel's equation, solution, Bessel's function of first and second kind, recurrence formula, Legendre's equation, its solution, Legendre polynomials, Rodrigue's formula, orthogonality of Legendre polynomial. **Lecture: 15**
2. **Partial differential equation:** Basic concept, 1st & 2nd order linear & quasi- liear partial differential equation, classification of second order PDE, boundary and initial conditions, wave equations, separation of variables, use of Fourier series. D'Alembert's solution of wave equation, Heat equation, solution by Fourier series. **Lecture: 15**

Second Term

3. **Complex analysis-I:** Function of complex variables- limit, continuity, differentiability and analyticity of functions Cauchy-Reimann equations, Laplace's equation, harmonic function, Cauchy's integral theorem, Cauchy's integral formula, Taylor's and Laurent series, residues and its applications to evaluating real integrals. **Lecture: 15**
4. **Probability & Statistics:** Theorems on probability, including Baye's rule, random variable- cumulative distribution function, probability mass function, probability density function, mathematical expectation, mean variance, moment, generating function and characteristics function, standard probability model binomials, Poisson exponential, Weibull, normal and lognormal, sampling and sampling distribution, Chi-square and T-distributions, large and small sample tests of significance. **Lecture: 20**

Text books:

1. Advanced engineering mathematics by R K Jain & S R K Iyengar.
2. Higher engineering mathematics by B S Grewal.
3. Fundamentals of mathematical statistics by V K Kapoor, & S C Gupta, Sultan & sons.

Reference books:

1. Advanced engineering mathematics by E Kreyszig 8th edition, John Wiley.
2. Complex variable and applications by Churchill & Brown, McGraw Hill.
3. Elements of partial differential equation by I N Sneddon, McGraw Hill.
4. Introduction to probability & statistics for engineering by S M Ross, John Wiley.

NUMERICAL METHOD & COMPUTATIONAL TECNIQUE (CSE/EE/ME/CE/ECE/IT)

BRANCH CODE-CS-202 L-T-P: 2-1-3

FIRST TERM

1. INTRODUCTION TO COMPUTER LANGUAGE:

Machine language, assembly language, high level language, compilers, problem solving using computer Algorithm, flowchart, examples lecture-03

2. C/C++ PROGRAMMING:

Constants & variables, arithmetic expression, i/o statement, specification statement, control statement, subscripted variables, logical expression, function and subroutines, examples of programming should include numerical as well as non numeric applications, matrix operations, searching, sorting. lecture-21

SECOND TERM

3. ITERATIVE TECHNIQUE FOR SOLUTION OF EQUATION:

I.SOLUTION OF NON LINEAR EQUATION-simple iteration scheme, bisection method, Regula-falsi method, Newton-Raphson method, secant method, their rates of convergence, order of errors etc. lecture-12

ii. SOLUTION OF LINEAR EQUATION-Gaussian elimination, matrix inversion by Gaussian method, computation of determinants, Jacobi and Gauss - Seidal iteration method.

Lecture-06

4. POLYNOMIAL APPROXIMATION: interpolation,several form of interpolating polynomials like Lagrangian interpolation of polynomial and Newtons forwared and backward difference formula,curvefitting(least square) lecture-04

5 NUMERICAL INTEGRATION: Trapezoidal method , Simpsons' rule($1/3^{rd}$ and $3/8^{th}$) order of errors in integration. lecture-04

6. SOLUTION OF INITIAL VALUE PROBLEMS: Euler's method, Runge – kutta second order and fourth order methods (without proof), solution of boundary value problem-finite difference method. Lecture-05

TEXT BOOK.

1. NUMERICAL METHODS FOR SCIENTIFIC FOR ENGINEERING COMPUTATIONS BY M.K.JAIN,LYENGAR AND R.K.JAIN, NEW AGE INTERNATIONAL PUBLISHERS, NEW DELHI

2. INTRODUCTORY METHOD OF NUMERICAL ANALYSIS BY S.S.SASTRY, PHI PVT. LTD.

REFERENCE BOOKS

1. NUMERICAL ANANLYSIS IN ENGINEERING BY RAMA B. BHAT, S.CHAKRAVARTY, NAORSA PUBLISHING HOUSE

2. ADVANCED ENGINEERING MATHEMATICS BY E.KREYSZIG, 8th EDITION BY JOHN WILLEY & SONS, NEW YORK.

CT LAB

WORKING IN WINDOWS ENVIROMENT,FORTRAN 77 PROGRAMMING BASED ON SYLLABUS

Subject: Basic Electronics Branch Code: CS-203 (ECE/CSE/EE/ME)

L-T-P: 2-1-3

First Term

1. **PN junction diode**: Semiconductor, Depletion layer, barrier potential, forward and reverse bias, break down voltage, PIV, characteristics of PN junction diode, knee voltage, ideal PN junction diode, [illegible] capacitance, breakdown diode (zener diode). **Lecture: 10**
2. **Rectifiers and filters**: Half wave and full wave rectifiers (centre tapped and bridge), regulation, ripple factor, elementary theory of filter, L, C, L-C, and π filters. Clipping and clamping circuit, voltage multiplier. **Lecture: 9**
3. **BJT introduction**: Basic theory and operation of PNP and NPN transistors, characteristics of CB, CE and CC configurations and determination of α, β, γ and their relations. **Lecture: 5**

Second Term

4. **Biasing:** Base bias, emitter feedback bias, voltage divider bias, load line, operating point. Incremental analysis using h-model. **Lecture: 8**
5. **FET:** Introduction, operation, JFET parameters, JFET characteristics, JFET amplifiers. **MOSFET:** Introduction, operation, MOSFET parameters. **Lecture: 6**
6. **Feedback amplifiers:** Theory of feedback amplifier, positive and negative feedback, feedback topologies, feedback amplifiers. **Lecture: 4**
7. **Integrated circuits:** Characteristics of ideal op-amp, Application as inverting, non-inverting amplifiers, summer, difference, differentiator, integrator. **Lecture: 4**
8. **Principle and applications** of SCR and UJT. **Lecture: 2**

Text Books:

1. Electronic devices and circuits theory by Boylestad and Nashelsky, Pearson.
2. Electronic principles by Albert Malvino and Davis J Bates, TMH.
3. Art of Electronics by Paul H Horowitz.

Reference:

1. Introduction to electronic circuit design by Spencer, Pearson.
2. Device electronics for integrated circuits by Muller and Kamins with Masun Chan, Wiley eastern edition.
3. Principles of electronics by V K Mehta and Rohit Mehta, S Chand.
4. Electronic circuit and system by R J Smith, Wiley.

Basic Electronics Lab:

1. Introduction to DMM (Digital multimeter)
2. Introduction to passive components (resistor, capacitor, and inductor)
3. Introduction to CRO- time period measurement, study of different wave forms, measurements of frequency of sinusoidal waveforms by Lissajou's figure.
4. Introduction to connectors- multi strand wires and single strand wires and bread boards.
5. Study of output characteristics of diode, BJT, FET, UJT, SCR.
6. Application of diodes, BJT, FET, UJT and SCR, clipping and clamping, rectification, RC coupled CE and CS FET amplifiers, relaxation oscillators.
7. Application of μA 741 inverting amplifiers, summer amplifiers, difference amplifiers, integrator and differentiator.

Text Book:

Lab manual by Maheshwari, PHI.

SYSTEM PROGRAMMING & COMPILER DESIGN

BRANCH CODE- CS-204 L-T-P:2-1-3

FIRST TERM

1. INTRODUCTION: system software and its components lecture-04

2. ASSEMBLERS: elements of assembly language programming, assembly process, machine dependent assembler, machine-independent, design of multipass / 2-pass assembler, single pass assembler

Lecture-08

3. MACROS AND MACRO PROCESSOR: macro definition and call macro expansion, nested macro calls, design of a macro processor lecture--06

4. LOADERS & LINKERS:

Basic loader function, machine- dependent loader, machine – independent loader,loader design option, absolute loader, bootstrap loader, relocation and linking concepts, design of linker, self relocating programs and overlay structure lecture-04

5. COMPILER MACHINE: machine – dependent compiler, machine – independent compiler, compiler design (options , interpreter, p-code compiler),compiler, case study of compiler lecture-04

6. SOFTWARE TOOLS:

Software tools for program development, editors, debug, monitors, programmers ' , environments user interfaces lecture-04

SECOND TERM

1. INTRODUCTION TO COMPILERS:

Compilers and translators, the phases of compiler, compiler writing tools, the lexical and system structure of language, operators, assignment statements and translation. Lecture-04

2 LEXICAL ANALYSIS :

The role of the lexical ananlysis , specification of tokens, lexical analysis tool lecture-02

3.SYNTAX ANALYSIS:

Role of parser, CFG,top- down parsing,operator-precedence parsing tool,parsers, the canonical collection of LR(0) items, constructing SLR, canonical LR nad LALR parsing tables, use of ambiguous grammars in LR Parsing, An automatic parser generator,implementation of LR parsing tables and constructing LALR sets of items, lecture-08

4. SYSTAX DIRECTED TRANSLATION:

Syntax tree, bottom up evolution of S-attributes definition,L-attributes common top- down translation, bottom – up evolution of inherited attributes, recursive evaluators, lecture-04

5. TYPE CHECKING:

Static dynamic checking, type expression, type checking, type equivalence, type conversion

Lecture-03

6.SYMBOL TABLES:

Structure of symbols tables,simple simple symbol table(linear table,ordered list, tree, hash table,scoped symbol table(nested lexical scoping , one table per scope, one table for all scopes) Lecture-03

7.INTERMIDIATES CODE GENERATION:

Intermediates language, intermediate representation technique, three – address code, translation of assignmentstatements, Boolean expressions, control flow, case statement and function call.

Lecture-04

8.CODE GENERATION:

Factors affecting code generation, basic block, code generation for tree,Register and assignment, DAG representation, code generation using dynamic programming, code- generators Lecture-04

9.CODE OPTIMIZATION:

Errors, lexical- phase errors, syntactic- phase errors, semantic errors Lecture-04

10 CODE OPTIMIZATION:

Need for optimization of basic blocks, loops in flow graph, optimizing transformation compiler time evolution, common sub- expression elimination, variables propagation, code movement optimization,

strength reduction, dead code optimization, loop optimization, global optimization, computing global data flow equation, setting up data flow equation, data flow analysis. Lecture-04

TEXT BOOKS:

1. SYSTEM PROGRAMMING BY JOHN J. DONOVAN

2. COMPILER PRINCIPLES TECHNIQUES AND TOOLS BY AHO AND ULLMAN PEARSON EDUCATION

REFERENCE BOOK:

MODERN COMPILER DESIGN BY DICK GRUNE, E. BAL CERIEL J.H.JACOBS AND KOEN G. LANGENDOEN VILEY DREAMTECH

SPCD LAB

WORKING ON WINDOWS ENVIROMENT, INTERNET, ASSEMBLY LANGUAGE PROGRAMMING AND C PROGRAMMING BASED ON SYLLABUS

Subject: Digital Electronics Branch Code: CS-205 (ECE/CSE/EE)

L-T-P: 2-1-3

First Term

1. **Digital principle**: Analog vs Digital, number system, computer codes, digital signals, waveforms, positive and negative logic, Logic Gate: basic, universal and others, truth table, logic function, IC chips, timing diagram, electrical analogy. **Lecture: 5**
2. **Boolean laws and theorems:** Logic functions, conversion of logic functions into truth table and vice versa. SOP and POS forms of representation, min terms and max terms, simplification of logic functions by theorems and Karnaugh's map, don't care conditions, design of special purpose computers and related practical problems. **Lecture: 6**
3. **Analysis and synthesis of combinational logic circuits:** Adder and Subtractors, multiplexers, de multiplexers, encoders, decoders, code converters, magnitude comparators, parity generators and checkers. **Lecture: 6**
4. **Integrated circuit logic families:** RTL, DTL, TTL, CMOS, IIL/I²L. **Lecture: 5**

Second Term

5. **Sequential circuit blocks and latches:** flip-flops- rat-race condition, master slave and edge triggered, SR, JK, D & T flip flops, shift registers, counters- synchronous and asynchronous: design of ripple counter. **Lecture: 10**
6. **Timing circuits:** Multivibrators: monostable and astable, timer: LM555. **Lecture: 4**
7. **Use of building blocks** in designing larger systems such as digital to analog converter (DAC): weighted resistor and r-2r, analog to digital converter (ADC) comparator, counter and successive. **Lecture: 5**
8. **Memories:** Static and dynamic RAMs, ROM, EPROM, EEPROM. **Lecture: 3**

Text books:

1. Digital systems principles and applications by Tocci, Widmar and Jain, Pearson.
2. Digital fundamentals by Floyd and Jain, Pearson.

Reference books:

1. Fundamentals of VHDL design by Stephen Brown and Zovenkeo Vraseseic, TMH.
2. Introduction to logic design with cd ROM by Alan B Marcovity, TMH.
3. Fundamentals of digital logic with Verilog design by Stephen Brown TMH.
4. Modern digital electronics by R P Jain TMH.

Digital Electronics Lab:

1. Realization of logic gates including the universal gates.
2. Realization of the Boolean algebra.
3. Realization of the different logic circuits.