Detailed Program

Bachelor of Technology (B.Tech.)

(Computer Science Engineering)

Semester-III

(2016-20)

DOC201717040009

RNB GLOBAL UNIVERSITY

Educating stars for tomorrow

RNB GLOBAL UNIVERSITY

RNB Global City, Ganganagar Road,

Bikaner, Rajasthan 334601

OVERVIEW

RNB Global University follows Semester System. Accordingly, each academic year is divided into two semesters, **Odd (July-December) and Even (January-June).** Besides this, the university follows a system of continuous evaluation along with regular updating in course curricula and teaching pedagogy.

The curriculum for B. Tech Program for (July-Dec.) Semester, 2017 along with examination pattern is as follows:

Semester – III

S. No.	Course Code	Course Title	Credits
1.	19002000	Applied Mathematics-III	4
2.	19003400	Analysis and Design of Information Systems	3
3.	19003500	Data Structures	3
4.	19003600	Data Structures Lab	1
5.	19003700	Computer Architecture	4
6.	19003800	Operating Systems	3
7.	19003900	Operating Functions Lab	1
9.	19004000	Digital Electronic Circuits	3
10.	19004100	Digital Electronic Circuits Lab	1
11.	11012200	Human Values, Business & Managerial Ethics	2
12.	19004200	Ability and Skill Enhancement Module-III	3
13.	99002000	NSS/NCC	1
14.	99002100	Club Activities	1
15.	99001700	Seminar	1
Total Credits			**31**

EVALUATION SCHEME- THEORY

The evaluation of the theory paper of B.Tech would be based on Internal and External Assessments. Internal Assessment would consist of 50% of the marks (50 marks) and external assessment (in form of End Term Exam) would consist of remaining 50% marks (50 marks). Detailed scheme of Internal and External Assessments as follows:

Internal Assessment

Area of Assessment	Marking	Maximum Marks
Sessional-I	As per marks obtained	10
Sessional-II	As per marks obtained	10
Assignment + Presentation	15	15
Overall Conduct and Discipline	To be decided by concerned Faculty Member	5
Attendance	Student with 80% attendance will get 5 marks and 0.25 marks for every 1% attendance above 80 %	10
Total	**50**	

External Assessment

Type	Marks
Theory	50

EVALUATION SCHEME -PRACTICAL

The evaluation of the practical paper of B.Tech would be based on Internal and External Assessments. Internal Assessment would consist of 50% of the marks (50 marks) and external assessment (in form of End Term Exam) would consist of remaining 50% marks (50 marks). Detailed scheme of Internal and External Assessment is as follows:

Internal Assessment

Type	Details	Marks
Marks obtained in various manuals, practical file, participation, any model prepared, output of practical	Average of marks obtained	35
Discipline	To be decided by concerned faculty	5
Attendance	80% - 5 marks and 0.25 percent for every one percent above 80 %	10
TOTAL	**50**	

External Assessment

Type	Marks
Practical	50

EVALUATION SCHEME- NSS/NCC AND CLUB ACTIVITIES

1. NSS/NCC will be evaluated internally.
2. The students have to join club/clubs with the active participation in different activities of club. The students would be continuously assessed.

CURRICULUM

Course Name: Applied Mathematics-III

Course Code: 19002600

Course Outline

Unit I Fourier Series and Fourier Transforms : Euler's formulas, conditions for a Fourier expansion, change of interval, Fourier expansion of odd and even functions, Fourier expansion of square wave, rectangular wave, saw-toothed wave, half and full rectified wave, half range sine and cosine series. Fourier integrals, Fourier transforms, Shifting theorem, Fourier transforms of derivatives, Fourier transforms of integrals, Convolution theorem, Fourier transform of Dirac-delta function.

Unit II Functions of Complex Variable: Definition, Exponential function, Trigonometric and Hyperbolic functions, Logarithmic functions. Limit and Continuity of a function, Differentiability and Analyticity of function. Cauchy-Riemann equations, necessary and sufficient conditions for a function to be analytic, polar form of the Cauchy-Riemann equations. Harmonic functions, application to flow problems, Integration of complex functions. Cauchy-Integral theorem and formula

Unit III Power series, radius and circle of convergence, Taylor's, Maclaurin's and Laurent's series. Zeroes and singularities of complex functions, Residues Evaluation of real integrals using residues (around unit and semi-circle only)
Linear Programming: Linear programming problems formulation, solving linear
Programming problems using (i) Graphical method (ii) Simplex method (iii) Dual simplex method.

Unit IV Probability Distributions and Hypothesis Testing: Conditional probability, Bayes theorem and its applications, expected value of a random variable. Properties and application of Binomial, Poisson and Normal distributions,
Testing of a hypothesis, tests of significance for large samples, Student's t-distribution (Applications only), Chi-square test of goodness of fit.

Suggested Reading

1. Advanced Engg. Mathematics: F Kreyszig.
2. Higher Engg. Mathematics: B.S. Grewal.
3. Engineering Mathematics by Babu Ram Pearson media Publication
4. Advance Engg. Mathematics: R.K. Jain, S.R.K.Iyenger.
5. Advanced Engg. Mathematics: Michael D. Greenberg.

Course Name: Analysis and Design of Information Systems

Course Code: 19003400

Course Outline:

Unit I: Introduction to System Development: Categories of Information Systems, Structured analysis method, System prototype method, succeeding as system analyst.
Analysis: Feasibility study, Feasibility considerations, Steps in feasibility analysis, Cost and Benefit analysis, Procedure for cost and benefit determination.

Unit-II Requirement Analysis: Problem definition, Identification and Investigation of system, Fact finding techniques, Tools for documenting procedures and decisions.

Design: System design considerations, Process and stages of system design: Logical and Physical, Selection of best alternate design strategy.

Design of Input: Capturing data for input, Input validation design of output: Output objectives, Types of output, Presentation format of output, Design of software: Top Down Structure, Coupling, Cohesion, Span of control, Module size, Shared modules.

Unit-III Tools for Structured Design Object Oriented Analysis and Modeling: Object technology basics, OOAD methods, Introduction to object modeling, UML Diagrams, and Process of object modeling.

Object Oriented Design and Modeling: Introduction to object oriented design, Designing Object responsibilities, and Object reusability.

Unit-IV Management Information Systems (MIS): Overview of analysis and design of Management Information Systems.

Case Study of Some Common Systems: Inventory control, Laboratory management systems, Hotel reception system, Hospital management system etc./ Seminar on State-of the-art technology.

Suggested Readings:

1. Senn, J. A., Analysis and Design of Information Systems, Tata McGraw Hill (1989) 2nd ed.
2. Whitten, J. and Bentley, L., Introduction to Systems Analysis and Design, Tata McGraw Hill (2006).
3. Priestley, M., Practical Object-Oriented Design with UML, McGraw Hill (2009) 2nd ed.
4. Rumbaugh, J. R., Jacobson, I. and Booch, G., The Unified Modeling Language Reference Manual, Pearson Education (2004) 2nd ed.

Course Name: Data Structure

Course Code: 19003500

Course Outline:

Unit I: Introduction: Algorithm complexity and Big O notation, Recursion and its importance, Tower of Hanoi problem.
Stacks: Concept, Operations and representation, Application to evaluation of postfix expressions, Conversion from infix to postfix representation.

Unit-II Queues: Sequential representation, Operations, Priority queues, and Array implementation.

Linked Lists: Concept, Operations, Stacks and queues as lists, Array and dynamic representation Circular lists, Doubly linked lists, Josephus problem.

Unit-III Trees: Definition, Array and dynamic representations, Operations, Lists as trees, Almost Complete binary trees, Threaded binary trees, AVL trees, Heaps.
Graphs: Applications of graphs.
Sorting: Efficiency considerations, O notation, Bubble sort, Quicksort, Selection sort, Binary Tree sort heap, Heapsort, Heap as a priority queue, Insertion sort, Shell sort, Merge sort, Radix sort.

Unit-IV Searching: Sequential searching, Indexed sequential searching, Binary search, Interpolation search, Binary tree searching, Insertion and deletion, Optimum search trees, Height balanced trees, Single and double rotations, Multi way, Search trees, B-trees, B+-trees, Hashing methods of resolving clashes, Methods of choosing Hash functions.

Course Name: Data Structure Lab

Course Code: 19003600

Laboratory work: Implementation of Arrays, Recursion, Stacks, Queues, Lists, Binary trees, Sorting techniques, Searching techniques in C/C++.

Suggested Reading

1. Kruse, R.L., Leung, B.P. and Tondo, C.L., Data Structures and Program Design in C, Dorling Kindersley (2008).
2. Langsam, Y. and Augenstein, M.J., Data Structures Using C and C++, Dorling Kindersley (2008) 2nd ed.
3. Trembley, J.P., Sorenson, P.G., An introduction to data structures with applications, Tata McGraw Hill (2008) 2nd ed.
4. Sahni, Sartaj, Data Structures, Algorithms and Applications in C++, Universities Press (2005) 2nd ed.

Course Name: Computer Architecture

Course Code: 19003700

Course Outline:

Unit I: Basics of Digital Electronics: Codes, Logic gates, Flip flops, Registers, Counters, Multiplexer, Demultiplexer, Decoder, Encoder. **Register Transfer and Micro operations:** Register transfer Language, Register transfer, Bus & memory transfer, Logic micro operations, Shift micro operation. **Basic Computer Organization:** Instruction

codes, Computer instructions, Timing & control, Instruction Cycles, Memory reference instruction, Input/Output & Interrupts, Complete computer description & design of basic computer.

Unit-II Control Unit: Hardwired vs. Micro programmed control unit. **Central Processing Unit**: General register organization, Stack organization, Instruction format, Data transfer & manipulation, Program control, RISC, CISC.

Computer Arithmetic: Addition & subtraction, Multiplication Algorithms, Division algorithms.

Unit-III Input-Output Organization: Peripheral devices, I/O interface, Data transfer schemes, Program control, Interrupt, DMA transfer, I/O processor.

Memory Unit: Memory hierarchy, Processor vs. memory speed, High-speed memories, Cache memory, Associative memory, Interleave, Virtual memory, Memory management.

Unit-IV Introduction To Parallel Processing: Pipelining, Characteristics of multiprocessors, Interconnection structures, Interprocessor arbitration, Interprocessor communication & synchronization.

Suggested Readings:

1. Mano, Morris M., Computer System Architecture, Prentice Hall (1992) 3rd ed.
2. Hayes, J.P., Computer Architecture and Organization, McGraw Hill (1998) 3rd ed.
3. Hennessy, J.L., Patterson, D.A, and Goldberg, D., Computer Architecture A Quantitative Approach, Pearson Education Asia (2006) 4th ed.
4. Leigh, W.E. and Ali, D.L., System Architecture: software and hardware concepts, South Wester Publishing Co. (2000).

Course Name: Operating Systems

Course Code: 19003800

Course Outline

Unit-I Introduction: Definition and types of operating systems, Batch Systems, multi programming, time–sharing parallel, distributed and real-time systems, Operating system structure, Operating system components and services, System calls, system programs, Virtual machines. Process Management:

Unit-II Process concept, Process scheduling, Cooperating processes, Threads, Inter-process communication, CPU scheduling criteria, Scheduling algorithms, multiple processor scheduling, Real-time scheduling and Algorithm evaluation. Process Synchronization and Deadlocks: The Critical-Section problem, synchronization hardware, Semaphores, Classical problems of synchronization, Critical regions, Monitors, Deadlocks-System model,

Characterization, Deadlock prevention, Avoidance and Detection, Recovery from deadlock, Combined approach to deadlock handling.

Unit-III Storage management: Memory Management-Logical and Physical Address Space, Swapping, Contiguous Allocation, Paging, Segmentation with paging, Virtual Memory, Demand paging and its performance, Page replacement algorithms, Allocation of frames, Thrashing, Page Size and other considerations, Demand segmentation, File systems, secondary Storage Structure

Unit-IV File concept, access methods, directory implementation, Efficiency and performance, recovery, Disk structure, Disk scheduling methods, Disk management, Recovery, Swap-Space management, Disk reliability.

Unit-V Protection and Security-Goals of protection, Domain of protection, Access matrix, Implementation of access Matrix, Revocation of Access Rights, language based protection, The Security problem, Authentication, One Time passwords, Program threats, System threats, Threat Monitoring, Encryption.

Suggested Readings

1. W. Stalling, Data & Computer Communication, 8th edition, Prentice Hall of India, 2006.
2. A Silberschatz, P.B. Galvin, G. Gagne, Operating Systems Concepts, 8th Edition, John Wiley Publications 2008.
3. A.S. Tanenbaum, Modern Operating Systems, 3rd Edition, Pearson Education 2007.
4. G. Nutt, Operating Systems: A Modern Perspective, 2nd Edition Pearson Education 1997.

Course Name: Operating Functions Lab

Course Code: 19003900

List of Experiments

1. Usage of following commands: ls, pwd, tty, cat, who, who am I, rm, mkdir, rmdir, touch, cd.
2. Usage of following commands: cal, cat(append), cat(concatenate), mv, cp, man, date.
3. Usage of following commands: chmod, grep, tput (clear, highlight), bc.
4. Write a shell script to check if the number entered at the command line is prime or not.
5. Write a shell script to modify “cal” command to display calendars of the specified months.
6. Write a shell script to modify “cal” command to display calendars of the specified range of months.
7. Write a shell script to accept a login name. If not a valid login name display message – “Entered login name is invalid”.

8. Write a shell script to display date in the mm/dd/yy format.
9. Write a shell script to display on the screen sorted output of "who" command along with the total number of users
10. Write a shell script to display the multiplication table any number,
11. Write a shell script to compare two files and if found equal asks the user to delete the duplicate file. 12. Write a shell script to find the sum of digits of a given number.
12. Write a shell script to merge the contents of three files, sort the contents and then display them page by page.
13. Write a shell script to find the LCD(least common divisor) of two numbers.
14. Write a shell script to perform the tasks of basic calculator.
15. Write a shell script to find the power of a given number.
16. Write a shell script to find the factorial of a given number.
17. Write a shell script to check whether the number is Armstrong or not.
18. Write a shell script to check whether the file have all the permissions or not.

Course Name: Digital Electronic Circuits

Course Code: 19004000

Course Outline:

Unit I:Number Systems: Number systems, Conversions, Number Representations, Demorgans Theorem, Boolean Algebra and Arithmetic operations. Binary codes, Error detection and correction codes.

Unit-II Combinational circuits: Simplification of Boolean functions by K-map method and Q. M. method, Half adder, Full adder, BCD adder, High speed adder, subtractor, multiplier, dividers, ALU, Code conversion, Magnitude comparators, Encoders, Decoders, Multiplexers, Demultiplexer, Application of Encoders, Decoders, MUX, DEMUX. Implementation using ROM, PLA, PAL, FPGAs & TTL ICs for their applications.

Unit-III Sequential circuits: Various types of flip-flops and their conversions. Registers, Timing issues, Counters- Synchronous, Asynchronous. Finite state machines. Design of Synchronous sequential circuits. Design of Asynchronous circuits, cycles, races and hazards.

Unit-IV Memories Types of ROM. RAM- Static and Dynamic, Representative circuits for cells using BJT and FETs, Timing diagrams of memories. Memory expansion using ICs, Flash memory, CCD, latest trends in memories.

Logic circuits: ECL, TTL, MOS, CMOS logic families their comparison. Detailed study of TTL, CMOS and their characteristics, fanout, unit load, current & voltage parameters. Tristate Logic. Interfacing of TTL & CMOS logic families

Course Name: Digital Electronics Circuits Lab

Course Code: 19004100

Laboratory Work

1. Introduction to Digital Laboratory Equipments & IC‟s
2. To study basic gates and verify their truth tables.
3. To design and construct basic flip-flops
4. To design and implement Binary to Gray
5. To design and implement Gray to Binary
6. To Design adder circuit.
7. To Design subtractor circuit.
8. To Design Bit Comparator circuit.
9. To design and construct of Synchronous Counter
10. To design and construct Asynchronous counter
11. To realize Basic gates (AND,OR,NOT) From Universal Gates(NAND & NOR).
12. To study about full adder & verify its truth table.

Suggested Readings:

1. Modern Digital Electronics- R. P. Jain, Tata McGraw Hill Pub. Company
2. Digital Fundamentals-Thomas L. Floyd, Universal Publishing House
3. Digital Electronics: An Introduction to Theory and Practice-William H. Gothmann, Prentice Hall of India
4. Digital Principles and Applications, A.P.Malvino, McGraw Hill International Editions

Course Name: Human Values, Business and Managerial Ethics

Course Code: 11012200

Course Outline

Unit - I Values & Ethics Concept of Values and its formation; Values and Behaviour. What is Ethics? Nature and scope of Ethics; Morality vs. Legality dilemma. Facts and value; Ethical subjectivism and Relativism, Moral Development (Kohlberg's 6 stages of Moral Development), Ethics and Business, Myth of a moral business.

Unit – II Decision making (Normal Dilemmas and Problems): Application of Ethical theories in Business (i) **Utilitarianism** (J.Bentham and J.S. Mill), (ii) **Deontology** (I. Kant) (iii) **Virtue Ethics** (Aristotle). **Economic Justice: Distributive Justice**, John Rawls **Libertarian Justice** (Robest Nozick)

Unit – III Corporate Social Responsibility of Business: Concept of CSR; Changing expectation of society; Model's of CSR: - Carroll's Model; Ackerman's Model. Why Social Responsibility of Business? Arguments in Favour and in against of Social Responsibility. **Consumerism and Consumer Rights.**

Unit – IV Ethical Issues in Business: Marketing: Characteristics of Free and Perfect competitive market, Monopoly oligopoly, Corruption and Bribery; Ethics in Advertising (Truth in Advertising). **Finance:** Fairness and Efficiency in Financial Market, Insider Trading, Greenmail, Golden parachute. **HR:** Workers Right and Duties: Work place safety, sexual harassment, whistle blowing.

Unit – V Managerial Ethics Ethical Decision Making. Role of Moral philosophy in decision making; Argument for and against of Ethics in Business. Challenge of ethical issues due to Globalization. Power and Politics in organization. Hierarchism as an organizational values. Indian ethos in Management.

Suggested Readings

1. Business Ethics Text and Cases , C.S.V.Murthy, Himalaya Publishing House
2. Business Ethics, Francis & Mishra, TMH
3. Business Ethics, Fernando A. C. , Pearson
4. Values & Ethics, Kaur Tripat, Galgotia Publishers
5. Ethics in Management: A Vedantic Perspective; Chakraborty, S. K. Oxford University Press

Note: The review of Syllabus happens on periodic basis for the benefit of the students. In case there are changes in curriculum due to review, students would be intimated in writing.

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