Detailed Program

Bachelor of Technology (B.Tech.)

(Computer Science Engineering)

Semester-III

(2017-21)

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-December) Odd Semester, 2018 along with examination pattern is as follows:

Course Scheme

Semester – III

S. No.	Course Code	Course Title	L	T	P	Credits
1.	19002600	Applied Mathematics-III	3	1	0	4
2.	19003400	Analysis and Design of Information Systems	3	0	0	3
3.	19003500	Data Structures	3	0	0	3
4.	19003600	Data Structures Lab	0	0	2	1
5.	19008600	Object Oriented Programming with C/C++	3	1	0	4
6.	19008700	Object Oriented Programming with C/C++ Lab	0	0	2	1
7.	19003800	Operating Systems	3	0	0	3
8.	19003900	Operating Functions Lab	0	0	2	1
9.	19004000	Digital Electronic Circuits	3	0	0	3
10.	19004100	Digital Electronic Circuits Lab	0	0	2	1
11.	11012200	Human Values, Business & Managerial Ethics	2	0	0	2
12.	19004200	Ability and Skill Enhancement Module-III	2	0	0	2
13.	99002700	Human Values & Social Service/NCC/NSS	-	-	-	1
14.	99002800	Workshops & Seminars	-	-	-	1
Total			**22**	**2**	**8**	**30**

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

The distribution of Internal Assessment Marks is as follows:

Type	Details	Marks
Mid Term	Two Mid-term Sessional of 15 marks each (15+15)	30
Marks obtained in various Tests, Assignments, Presentations, Quiz, Tutorials, etc.	Average of marks obtained	15
Attendance	75%+ : 5 marks	5
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	45
Attendance	75%+ : 5 marks	5
TOTAL	**50**	

External Assessment

Type	Marks
Practical	50

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 Readings

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, Quick sort, 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.

Suggested Readings

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: Data Structure Lab

Course Code: 19003600

Course Outline:

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

Course Name: Object Oriented Programming with C/C++

Course Code: 19008600

Course Outline:

Unit I
Review: Review of basic concepts of object-oriented programming, Comparison between procedural programming paradigm and object-oriented programming paradigm. Classes and Objects: Specifying a class, Creating class objects, Accessing class members, Access specifiers – public, private, and protected, Classes, Objects and memory, Static members, The const keyword and classes, Static objects, Friends of a class, Empty classes, Nested classes, Local classes, Abstract classes, Container classes, Bit fields and classes.

Unit II
Console Based I/O: Concept of streams, Hierarchy of console stream classes, Input/output using Overloaded operators >> and << and Member functions of I/O stream classes, Formatting Output, Formatting using ios class functions and flags, Formatting using manipulators. Constructors and Destructors: Need for constructors and destructors, Copy constructor, Dynamic constructors, Destructors.

Unit III
"for", "while" and "do – while" loops, break and continue statement, nested control statement, value returning functions, void functions, value versus reference Parameters, local and global variables, static and automatic variables, enumeration type, one dimensional array, two dimensional array, character array, pointer data and pointer variables.

Unit IV
Object Oriented Concepts: Abstraction, encapsulation, inheritance and its types, static and dynamic binding, overloading. Program Development: Object oriented analysis, design, unit testing & debugging, system testing & integration, maintenance.

Virtual Functions and Polymorphism: Concept of Binding - Early binding and late binding, Virtual functions, Pure virtual functions, Abstract classes, Virtual destructors & polymorphism.

Suggested Readings:

1. Lippman, S.B. and Lajoie, J., C++Primer, Pearson Education (2005) 4th ed.
2. Stroustrup, Bjarne, The C++ Programming Language, Pearson Education (2000)3rd ed.
3. Eills, Margaret A. and Stroustrup , Bjarne, The Annonated C++ Reference Manual, Pearson Education (2002).

4. Rumbaugh, J.R., Premerlani, W. and Blaha, M., Object Oriented Modeling and Design with UML, Pearson Education (2005) 2nd ed.
5. Kanetkar, Yashvant, Let us C++, Jones and Bartlett Publications (2008) 8th ed

Course Name: Object Oriented Programming with C/C++ Lab

Course Code: 19008600

Course Outline:

List of Programs

1. WAP to print the sum and product of digits of an integer.
2. WAP to reverse a number.
3. WAP to compute the sum of the first n terms of the following series S = 1+1/2+1/3+1/4
4. Write a function to find whether a given no. is prime or not. Use the same to generate the prime numbers less than 100.
5. WAP to compute the factors of a given number.
6. Write a program that swaps two numbers.
7. WAP to print a triangle of stars as follows (take number of lines from user):

```
      *
     ***
    *****
   *******
  ********
```

8. WAP to perform following actions on an array entered by the user: i) Print the even-valued elements ii) Print the odd-valued elements.
9. Calculate and print the sum and average of the elements of array
10. Print the maximum and minimum element of array
11. Write a program that swaps two numbers using pointers.
12. Write a program which takes the radius of a circle as input from the user, passes it to another function that computes the area and the circumference of the circle and displays the value of area and circumference from the main() function.
13. WAP to display Fibonacci series using recursion.
14. WAP to display Fibonacci series using iteration.
15. WAP to calculate Factorial of a number using iteration
16. WAP to calculate Factorial of a number using recursion
17. Create Matrix class using templates. Write a menu-driven program to perform following Matrix operations (2-D array implementation): a) Sum b) Difference

18. Create a class Box containing length, breath and height. Include following methods in it:
    a) Calculate surface Area
    b) Calculate Volume
19. Create a class Triangle. Include overloaded functions for calculating area. Overload assignment operator and equality operator.
20. Create a structure Student containing fields for Roll No., Name, Class, Year and Total Marks. Create 10 students and store them in a file.

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

Course Outline:

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

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: Digital Electronics Circuits Lab

Course Code: 19004100

Course Outline:

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.

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 Favor 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, whistles 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 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

Course Name: Ability & Skill Enhancement Module III

Course Code: 19004200

Course Outline - Final Assessment – Preparing a documentary

Unit I: Book & Movie Reviews
What is Book Review, Purpose & Importance of Book Review, Types of Book Review, Elements & Steps of Writing Book Review, What is Movie Review, Purpose & Importance of Movie Review, Types of Movie Review, and Elements & Steps of Writing Movie Review.

Unit II: LSWR Skills
Reading Comprehension, Rewriting Mythology/Folklore, Debate, News Analysis, Role Plays.

Unit III: Emotional Intelligence & Handling Emotions
What is emotional intelligence, E.Q. Tests, performing under pressure, how to take right decisions under pressure keeping balance in difficult emotional situations. The science of emotional intelligence, characteristics of emotional intelligence, Emotions handling- identifying good and bad emotions, how to control emotions, how to manage negative emotions keeping balance of mental stability, stress and distress.

Unit IV : Group Discussion Skills
What is GD, Types of Group Discussions, Do's & Dont's, Participation, Thinking, Structuring, Group Behaviour, Leadership Skills, Interpersonal Skills, Persuasive Skills, Conceptualization Skills.

Unit V: Documentary Making
What is documentary, aims & objectives, documentary for social cause, Documentary/Movie Screening & Reviews, preparing a documentary, Narration.

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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