# Detailed Course Scheme

# Bachelor of Technology (B.Tech.)
# (Computer Science Engineering)

# Semester-IV

# (2016-20)

DOC201712080018



## 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 (January- June) Even Semester, 2018 along with examination pattern is as follows:

## Course Scheme

### *Semester –IV*

| S. No. | Course Code | Course Title | Credits |
|--------|-------------|--------------|---------|
| 1. | 19005300 | Optimization Techniques | 3 |
| 2. | 19006100 | Advanced Numerical Techniques Computation Lab (ANTC) | 2 |
| 3. | 19006000 | Software Engineering | 3 |
| 4. | 19005600 | Computer Networks | 3 |
| 5. | 19005700 | Computer Networks Lab | 1 |
| 6. | 19005800 | Principles of Programming Languages | 3 |
| 7. | 19005900 | Principles of Programming Languages Lab | 1 |
| 8. | 19005400 | Web Technologies | 3 |
| 9. | 19005500 | Web Technologies Lab | 1 |
| 10. | 11017100 | Organizational Behavior | 2 |
| 11. | 19006200 | Ability & Skill Enhancement Module - IV | 3 |
| 12. | 99002000 | NSS/NCC/Similar Activities | - |
| 13. | 99002100 | Club Activities | - |
| 14. | 99001700 | Seminar | - |
| **Total Credits** | | | **25** |

## 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 0.25marks 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 /Similar activities prescribed by University will be completed from Semester I – Semester VI. It will be evaluated internally by the respective institute. The credit for this will be given after VIth Semester.

2. The students have to join club/clubs with the active participation in different activities of club. The students would be continuously assessed from Semester I – Semester VI and credits and marks would be given after VIth Semester.

# CURRICULUM

## Course Name: Optimization Techniques

## Course Code: 19005300

**Course Outline:**

**Unit I Scope of Operations Research**: Introduction to linear and non-linear programming formulation of different models. **Linear Programming:** Geometry of linear programming, Graphical method, Linear programming (LP) in standard form, Solution of LP by simplex and revised simplex methods, Exceptional cases in LP, Duality theory, Dual Simple method, Sensitivity analysis.

**Unit II Network Analysis**: Transportation problem (with transshipment), Assignment problem, Traveling-salesman problem, Shortest route problem, Minimal spanning tree, Maximum flow problem. **Integer Programming:** Branch and bound algorithm, Traveling salesman problem.

**Unit III Dynamic programming:** Forward recursions, General problem, Reliability

problem, Capital budgeting problem, Cargo-loading problem. **CPM and PERT:** Drawing of networks, Removal of redundancy, Network computations, Free slack, Total slack, Crashing, Resource allocation.

**Unit IV Non-Linear Programming:** Characteristics, Concepts of convexity, maxima and minima of functions of n-variables using Lagrange multipliers and Kuhn-Tuker conditions, One dimensional search methods, Fibonacci, golden section method and gradient methods for unconstrained problems. **Software:** Introduction to software for optimization techniques (TORA).

**Suggested Readings:**

1. Taha, H.A., Operations Research: An Introduction, Prentice Hall of India (2007) 8th ed.
2. Kasana, H.S., Introductory Operation Research: Theory and Applications, Springer Verlag (2005).
3. Rardin, Ronald L., Optimization in Operations research, Pearson Education (2005).
4. Ravindran A, Phllips D.T. and Solberg J.J. Operation Research: Principles and Practice, John Wiley (2007).

# Course Name: Advanced Numerical Techniques Computation Lab (ANTC)

# Course Code: 19006100

**Course Outline**

**Laboratory Work**

Programming exercises on numerical and Statistical methods using C or C++ languages.

1. To detect the interval(s) which contain(s) root of equation $f(x)=0$ and implement bisection Method to find root of $f(x)=0$ in the detected interval.
2. To find the root of $f(x)=0$ using Newton-Raphson and fixed point iteration methods.
3. To evaluate the Newton's Forward Lagrange and divided difference interpolating polynomials of degree $\leq n$, Based on (n+1) points.
4. To solve linear system of equations using Gauss elimination (without pivoting) method.
5. To solve linear system of equations using Gauss- seidel method.
6. To find the dominant eigen-value and associated eigen-vector by Rayleigh power method.
7. To integrate a function numerically using trapezoidal and Simpson's rule.
8. To solve the initial value problem using modified Euler's and Runge-kutta methods.

9. Generation of random numbers for Binomial and Poisson distributions using Linear Congruential Genrator Algorithm.
10. Regression analysis using least square principle.
11. Correlation analysis for bivariate distribution.

**Suggested Readings:**

1. Conte, S.D and Carl D. Boor, Elementary Numerical Analysis: An Algorithmic approach, Tata McGraw Hill, New York (2005).
2. Johnson, R., Miller, I. and Freunds, J., Miller and Freund's Probability and Statistics for Engineers, Pearson Education(2005) 7th ed.
3. Gerald C.F and Wheatley P.O., Applied Numerical Analysis, Pearson Education (2008) 7th ed.
4. Mathew, J.H., Numerical Methods for Mathematics, Science and Engineering, Prentice Hall Inc.J (2002).
5. Meyer, P.L.. Introductory Probability and Statistical Applications, Oxford (1970) 2nd ed.
6. Jain M.K., Iyengar, S.R.K., and Jain, R.K. Numerical Methods for Scientific and Engineering Computation, New Age International (2008) 5th ed.
7. Walpole, Ronald E., Myers, Raymond H., Myers, Sharon L. and, Keying Ye, Probability and Statistics for Engineers and Scientists, Pearson Education (2007) 8th ed.

# Course Name: Software Engineering

# Course Code: 19006000

**Course Outline:**

**Unit I Introduction:** Introduction to Software Engineering, importance of Software, The Software Evolution, Software Characteristics, Software Applications, Software Crisis: Problem and Causes .**Software Development Life Cycle:** Waterfall model, Incremental and Evolutionary process models, Personal Software process (PSP) and Team Software process (TSP), Overview of agile process and aspect oriented programming

**Unit II Software Requirement Specification:** Problem Analysis, Requirement elicitation and Validation, Requirements modeling: Scenarios, Information and analysis classes, flow and behavioral modeling, documenting Software Requirement Specification (SRS).

**System Design:** Design Concepts, design models for architecture, component, data and user interfaces; Problem Partitioning, Abstraction, Cohesiveness, Coupling, Top Down and Bottom Up design approaches; Functional Versus Object Oriented Approach, Design Specification, 4GL.

**Unit III Coding:** TOP-DOWN and BOTTOM-UP structure programming, Information Hiding, Programming Style, and Internal Documentation, Verification. **Software Testing:** Levels of Testing, Functional Testing, Structural Testing, Test Plan, Test Case Specification, Software Testing Strategies, Verification & Validation, Unit, Integration Testing, Top Down and

Bottom Up Integration Testing, Alpha & Beta Testing, White box and black box testing techniques, System Testing and Debugging.
**Software Quality Assurance:** Software Configuration Management, Overview of Software Quality Control and Quality Assurance, ISO 9000 Certification for Software Industry, SEI Capability Maturity Model (CMM) and Comparison between ISO & SEI CMM.

**Unit IV Technical Metrics for Software:** A Framework for Technical Software Metrics, Metrics for the Analysis Model, Metrics for Design Model, Metrics for Source Code, Metrics for Testing, Metrics for Maintenance.

**CASE (Computer Aided Software Engineering):** CASE and its Scope, CASE support in Software Life Cycle, Documentation Support, Architecture of CASE Environment. Exposure to CASE tools like Rational Software suit, Turbo Analyst, Silk Suite.

**Suggested Readings:**

1. Roger S. Pressman, Software Engineering, A Practitioner's Approach, McGraw Hill International Edition (2009) 7th edition.
2. Ian Sommer ville, Software Engineering, Addison-Wesley Publishing Company, (2006) 8th ed.
3. Watts Humphery, A discipline for Software Engineering, Addison Wesley, Massachusetts (1995).
4. James F. Peter, Software Engineering - An Engineering Approach, John Wiley (2004).
5. Pankaj Jalote, An integrated Approach to Software Engineering, Narosa (2005).

# Course Name: Computer Networks

# Course Code: 19005600

**Course Outline:**

**Unit I Introduction:** Motivation, OSI model, Signals and media, Bits over signals, Synchronous communication, Modulation and modems, Bandwidth, Throughput, and noise, Time division and Frequency division multiplexing, Standards.

**Unit II Packet Transmission:** Multiplexing, Frames, Error correction techniques, LAN/WAN topologies, Shared media and media access, Bus topology, CSMA/CD, Wireless and CSMA/CA, Ethernet addressing and Wiring, hubs.

**Unit III Other LAN technologies:** Ring topology, Token passing rings, FDDI, Star topologies, Asynchronous transfer mode, IEEE 802.3, 802.5.

**Routing Algorithms:** Distance-Vector, Link-State, Shortest path computation, Dijkstra's algorithm, WAN technologies including frame relay, X.25, and ATM.

**Unit IV Internet working:** Motivation, Concept, Goals, IP addressing, Address binding with ARP, IP Datagram, Encapsulation IP fragmentation and reassembly, ICMP, TCP, UDP concept and datagrams, **Network Services:** Electronic mail, File transfer, Remote login-introduction to protocol specification, Validation and testing.

**Suggested Readings:**
1. Forouzan, B.A., Data communication and Networking, McGraw Hill (2006) 4th ed.
2. Tanenbaum, A.S., Computer Networks, Prentice Hall (2003) 4th ed.
3. Comer, D.E., Internetworking with TCP/IP Vol. 1 Principles, Portals and Architecture, Prentice Hall of India (2005) 5th ed.
4. Stallings, W., Computer Networking with Internet Protocols and Tech., Prentice Hall of India (2007).

# Course Name: Computer Networks Lab

# Course Code:  19005700

## Course Outline

1. Study of different Network cables and practically implement the cross-wired cable and straight through wire using clamping tool.
2. Study Network tools and basic devices
3. Study of Network IP addressing
4. To study about different physical equipment's used for networking.
5. To study different internetworking devices in a computer network
6. Aim: To study the working of Basic Networking Commands
7. To assign IP address to the PC connected to the internet
8. To connect the computers in Local Area Network

# Course Name: Principles of Programming Languages

# Course Code: 19005800

## Course Outline:

**Unit I Introduction:** Study of principles and major concepts in various programming paradigms like imperative, Functional, Object-oriented and logic programming. Introduction to various phases of compilers, Formal translation models: BNF Grammars and Macro processors.

**Imperative programming:** Location, reference and expressions, Assignment and control, Data types, Blocks, Procedures and Modules.

**Unit II Object Oriented Programming:** Concept of classes and objects, Introduction to abstraction and encapsulation, Inheritance and Polymorphism. **Functional Programming:** Functions as first class objects, Higher order functions, Polymorphic data types, Type checking and Type inferencing.

**Unit III Logic Programming:** Introduction to logic, Unification, Backtracking. **Introduction to storage management:** Introduction to storage management from programmer's view, Static storage management, Heap storage management.

**Unit IV Concurrent Programming:** Concept of concurrent programming, Processes, and Synchronization primitives. Case study/ Seminar on State-of-the-art topics in Programming Languages: Markup Languages, Wireless Markup Languages, Mobile agent paradigm, Cloud Computing etc. Illustration of the above concepts using representative languages: C, C++, Java, LISP and Prolog etc.

# Course Name: Principles of Programming Languages Lab

# Course Code: 19005900

**Course Outline**

**Laboratory work**

1. Implementation of object oriented concepts like inheritance, Polymorphism.
2. Programming in PHP, PERL, Markup Languages.
3. Implementation of concurrent programming, logic programming and use of open source tools (eg. LAMP).
4. Approximately four projects will be assigned on different languages/platforms.

**Suggested Readings**

1. Pratt, T.W. and Zelkowitz, M.V., Programming Languages - Design and Implementation, Prentice Hall (2006) 4th ed.
2. Sebesta, R.W., Concepts of Programming Languages, Addison Wesley (2008) 8th ed.
3. Sethi, Ravi, Programming Languages-Concepts and Constructs, Addison-Wesley (1996).
4. Tucker, A.B. and Noonan, R., Programming Languages-Principles and Paradigms, McGraw Hill (2007) 2nd ed.

# Course Name: Web Technologies

## Course Code: 19005400

**Course Outline:**

**Unit I Basics of Internet:** Concepts, Architecture: Internet, Intranet and Extranet, Design Goals, Issues and related aspects, addressing schemes, protocols, applications - e-mail, ftp, telnet, WWW, IRC.

**Unit II Intranet Connectivity:** Connection concepts, FDDI, ISDN, ADSL, PPP and ATM, Web servers and browser's , web server, proxy server, web browser.

**Unit III Network Security:** Network Security attacks and vulnerabilities of Network system, Data Security Encryption, key protocols, Document signatures, firewalls.

**Client Side Scripting:  Introduction to Javascript and DHTML.**

**Unit IV Web Programming:** Introduction to Web Pages, HTML, HTTP, SHTTP and XML, Front Page Forms and Form Handlers, Site design and Navigation, Java Programming - class design, inheritance, overloading, polymorphism, exception handling, file streams and their manipulation, servlets, JSP, JDBC,.NET technologies.

## Course Name: Web Technologies Lab

## Course Code: 19005500

**Course Outline**

**Laboratory Work:**

- Exploring various web browsers and web servers ,
- Designing web pages in HTML and XML.
- Using Front Page express.
- Programming for web in Java and JSP.

**Suggested Readings:**

9.  Raj Kamal,  Internet and Web Technologies , TMH,2002
10. Bayross, Web Enable Commercial Application Development Using HTML, DHTML, Javascript, Perl CGI , BPB Publications, 2000.
11. C Xavier , World Wide Web Design,  TMH, 2001
12. Monica D'Souza , Web publishing  TMH, 2001
13. HeithMorneau , Active Server Pages, Vikas Publishing House,2000
14. Ravi Kalkota,  Frontiers of electronic commerce, Addison Wesley, 2000

## Course Name: Organizational Behavior

## Course Code: 11017100

**Course Outline:**

**Unit I Introduction to Organizational Behaviour**: Today's Organizations, Challenges, Foundations of Organizational Behaviour, IndividualBehaviour: Perception, Values, Attitudes Motivation theories. Employees Motivations in Organization, Management by Objectives Learning Processes, Reward and Punishment.

**Unit II Foundations of Group Behaviour:** Interpersonal Communication, Leadership, Emotional Intelligence. Power & Polities, Conflict Process, Negotiations, Stress and Coping, Inter-Group Relations, Team Working.

**Unit III A Macro Perspective of Organizational Behaviour:** Organization Structure – Key Elements, Types and Basic Models, Work Design, Organizational Change, and Learning Organizations.

**Unit IV Organizational Behaviour:** Future Challenges Gender Diversity at the place of work, Changing world Scenario, Role of External Environment.

**Achieving Competitive:** Advantage Management of change, International issues in Organizational Behaviour.

**Suggested Readings**

1. Robbins, S.P., Organizational Behaviour, PHI (2007) 8th ed.
2. Lufthans F., Organizational Behaviour, Irwin Mc-Graw Hill. (2007) 11th ed.
3. Hellriegal, D., and Slocum, J.W., Organizational Behaviour, Southwestern Educational Publishing (2008).

## Course Name: Ability & Skill Enhancement Module- IV

## Course Code: 19006200

**Course Outline - Final Assessment – Mock Interviews & PI Kit Submission**

**Unit I - Tele – Etiquettes** Receiving Calls, Placing a call, Ending Calls, Transferring calls, Taking Message/ Voice Mails, Placing call on hold, Handling Complaints.

**Unit II – Confidence Building & Brain Storming** How to build confidence by positive thinking, identifying negative thoughts, how to control negative thoughts entering our mind, identifying personal talents, and its ways to improve, how to develop good habits and having principles and follow them at all times.

Need to learn new things, ideas and skills, what is brain storming, why do we need it, what are the different ways of brain storming through logics and reasoning, Brain Storming Session.

**Unit III – PI Kit** What is resume, Format of Resume, Formatting, Resume Preparation, Covering Letter, PI Kit.

**Unit IV - Interview Skills** Mastering the art of giving interviews in - selection or placement interviews, web /video conferencing, Mock Interview, HR Expert Mock Interview, Telephonic Interviews.

**Unit V** – **Internship Preparation: Company Specific Research and Presentation** Identifying domain specific industries, researching the industry, Industry analysis, Presentation on specific industry/company.

Note : The review of syllabus happens of periodic basis for the benefit of students and in case there are changed in curriculum due to review, students would be intimated in writing.

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