### COURSE OF STUDY AND SCHEME OF EXAMINATION OF B.TECH
**NATIONAL INSTITUTE OF TECHNOLOGY, RAIPUR**

**Branch- Computer science & Engineering**

**Course- B.Tech.(NIT Scheme)**

**Semester- VIII**

<table>
<thead>
<tr>
<th>S.No</th>
<th>Board of Studies</th>
<th>Sub. Code</th>
<th>Subject Name</th>
<th>Periods/wee k</th>
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<td>Comp.Sc. &amp; Engg.</td>
<td>CS20811(CS)</td>
<td>Software Project Management</td>
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<td>CS20812(CS)</td>
<td>Data Mining &amp; Ware Housing</td>
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<td>Comp.Sc. &amp; Engg.</td>
<td>Refer Table-3</td>
<td>Elective III</td>
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**H.O.D**
Comp.Sc. & Engg.

**MEMBER**
Board of Studies
Deptt. Of CS&E

**MEMBER**
Board of Studies
Deptt. Of CS&E

**MEMBER**
Board of Studies
Deptt. Of CS&E
### Elective – III

<table>
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<tr>
<th>S.NO.</th>
<th>Board of Studies</th>
<th>Subject Code</th>
<th>Subject Name</th>
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<tbody>
<tr>
<td>1</td>
<td>Computer Science &amp; Engg.</td>
<td>CS20831(CS)</td>
<td>Cellular &amp; Mobile Computing</td>
</tr>
<tr>
<td>2</td>
<td>Computer Science &amp; Engg.</td>
<td>CS20832(CS)</td>
<td>Cryptography Network Security</td>
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<td>CS20833(CS)</td>
<td>OODBMs</td>
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<td>Computer Science &amp; Engg.</td>
<td>CS20834(CS)</td>
<td>Decision Support Systems</td>
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<td>Computer Science &amp; Engg.</td>
<td>CS20835(CS)</td>
<td>Cyber Crime &amp; Laws</td>
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### Elective – IV

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<tr>
<td>1</td>
<td>Computer Science &amp; Engg.</td>
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<td>Graph Theory</td>
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<td>Computer Science &amp; Engg.</td>
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<td>Soft Computing</td>
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<td>Artificial &amp; Neural Network</td>
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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
SYLLABUS

Name of Subject | Software Project Management | Subject Code | CS20811(CS)
---|---|---|---
Semester | B.Tech VIII Sem | Board of Studies | Comp. Sc. & Engg.
Maximum Marks | 70 | Minimum Marks | 28
Lecture Periods/Week | Tutorial Periods/Week | Practical Periods/Week | Credits
3 | 1 | - | 4

UNIT-I: Introduction and Software Project Planning

UNIT-II: Project Organization and Scheduling

UNIT-III: Project Monitoring and Control
Dimensions of Project Monitoring & Control, Earned Value Analysis, Earned Value Indicators: Budgeted Cost for Work Scheduled (BCWS), Cost Variance (CV), Schedule Variance (SV), Cost Performance Index (CPI), Schedule Performance Index (SPI), Interpretation of Earned Value Indicators, Error Tracking, Software Reviews, Types of Review: Inspections, Walkthroughs, Code Reviews

UNIT-IV: Software Quality Assurance and Testing

UNIT-V: Project Management and Project Management Tools

Books:
1. Software Project Management by M. Cotterell
2. Information Technology Project Management
3. Management Information and Control by
4. Software Project Management by S. A. Kelkar
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
SYLLABUS

<table>
<thead>
<tr>
<th>Name of Subject</th>
<th>Data Mining and Ware Housing</th>
<th>Subject Code</th>
<th>CS20812(CS)</th>
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<td>Comp. Sc. &amp; Engg.</td>
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Unit-I Data Warehousing – Introduction and Design:
Overview And Concepts: Need for data warehousing, Basic elements of data warehousing, Architecture And Infrastructure: Architectural components, Infrastructure and metadata. Data Design And Data Representation: Principles of dimensional modeling, Dimensional modeling, data extraction, transformation and loading, data quality. OLAP in data warehouse – ROLAP, MOLAP, HOLAP. OLTP Vs OLAP, Various Data Warehouse Schemas.

Unit-II Data Mining - Introduction:
Data Mining Primitives, Languages, and System Architectures: Data mining primitives, Query language, Designing GUI based on a data mining query language, Knowledge Discovery in Databases (KDD), KDD Process, Data Preprocessing, Data Cleaning, Data Transformation, Data Compression and Dimension Reduction, Principal Component Analysis, Binning Methods.

Unit-III Data Mining – Characterization, Discrimination & DMQL:
Data generalization and summarization-based characterization, Analytical characterization: analysis of attribute relevance, Mining class comparisons: Discriminating between different classes, Mining descriptive statistical measures in large databases, DMQL.

Unit-IV Data Mining Techniques – Association Rules and Classification:

Unit-V Data Mining Techniques – Clustering & Advanced Topics:

Text Books:
2. Prabhu, Data ware housing- concepts, Techniques, Products and Applications, Prentice hall of India
Unit-I INTRODUCTION TO MOBILE & WIRELESS DEVICES

UNIT-II TELECOMMUNICATION & BROADCAST SYSTEMS

UNIT-III WIRELESS NETWORKS

UNIT-IV MOBILE NETWORK AND TRANSPORT LAYERS
Mobile Network Layer; Mobile IP, DHCP, ADHOC Networks; Mobile Transport Layer; Traditional TCP, Indirect TCP, Snooping TCP, Mobile TCP; Fast Transmit/Fast Recovery, Transmission/Time Out Freezing, Selective Retransmission, Transaction Oriented TCP.

Unit -V MOBILE SYSTEM DEVELOPMENT & SUPPORT

Name of Text Books:-
1. Mobile Communications – Schiller, Jochen; 2nd Indian Reprint, Pearson Education Asia – Addison Wesley Longman PTE. Ltd.
2. Wireless and mobile network architecture, Chlamtac, John Wiley and Sons.

Name of Reference Books :-
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
SYLLABUS

Name of Subject | Cryptography and Network Security | Subject Code | CS20832(CS)
--- | --- | --- | ---
Semester | B.Tech VIII Sem | Board of Studies | Comp. Sc. & Engg.
Maximum Marks | 70 | Minimum Marks | 28
Lecture Periods/Week | Tutorial Periods/Week | Practical Periods/Week | Credits
3 | 1 | - | 4

Unit-I

Unit-II
Standard(DES), strength of DES, differential and linear crypt analysis of DES, block cipher modes of operations, triple DES, IDEA encryption and decryption, strength of IDEA. Design of Stream Cipher RC5. Introduction to graph, ring and field, prime and relative prime numbers, modular arithmetic, Fermat’s and Euler’s theorem, primality testing, Euclid’s Algorithm, Chinese Remainder theorem, discrete logarithms. Principals of public key crypto systems, RSA algorithm, security of RSA, key management, Diffie-Hellman key exchange algorithm, introductory idea of Elliptic curve cryptography,

Unit-III

Unit-IV
Authentication Applications: Kerberos and X.509, directory authentication service, electronic mail security-pretty good privacy (PGP), S/MIME.

Unit-V

Books:
Unit I. The Extended Entity Relationship Model and Object Model:
The ER model revisited, Motivation for complex data types, User defined abstract data types and structured
types, Subclasses, Super classes, Inheritance, Specialization and Generalization, Constraints and characteristics
of specialization and Generalization, Relationship types of degree higher than two.

Unit II. Object-Oriented Databases:
Overview of Object-Oriented concepts, Object identity, Object structure, and type constructors, Encapsulation of
operations, Methods, and Persistence, Type hierarchies and Inheritance, Type extents and queries, Complex
objects; Database schema design for OODBMS; OQL, Persistent programming languages; OODBMS
architecture and storage issues; Transactions and Concurrency control, Example of ODBMS

Unit III. Object Relational and Extended Relational Databases:
Database design for an ORDBMS - Nested relations and collections; Storage and access methods, Query
processing and Optimization; An overview of SQL3, Implementation issues for extended type; Systems
comparison of RDBMS, OODBMS, ORDBMS

Unit IV. Parallel and Distributed Databases and Client-Server Architecture:
Architectures for parallel databases, Parallel query evaluation; Parallelizing individual operations, Sorting, Joins;
Distributed database concepts, Data fragmentation, Replication, and allocation techniques for distributed
database design; Query processing in distributed databases; Concurrency control and Recovery in distributed
databases. An overview of Client-Server architecture

Unit V. Databases on the Web and Semi Structured Data:
Web interfaces to the Web, Overview of XML; Structure of XML data, Document schema, Querying XML data;
Storage of XML data, XML applications; The semi structured data model, Implementation issues, Indexes for
text data.

Enhanced Data Models for Advanced Applications: Active database concepts. Temporal database concepts.;
Spatial databases, Concepts and architecture; Deductive databases and Query processing; Mobile databases,
Geographic information systems.

Name of Text Books:
1. Rajesh Narang, Object Oriented Interfaces and Databases, Prentice Hall of India

Name of Reference books:
1. Elmasri and Navathe, Fundamentals of Database Systems [4e], Pearson Education
4. C.J.Date, Longman, Introduction To Database Systems, Pearson Education
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
SYLLABUS

Name of Subject | Decision Support System | Subject Code | CS20834(CS)
Semester | B.Tech VIII Sem | Board of Studies | Comp. Sc. & Engg.
Maximum Marks | 70 | Minimum Marks | 28
Lecture Periods/Week | Tutorial Periods/Week | Practical Periods/Week | Credits
3 | 1 | - | 4

Unit-I Overview of different types of decision-making:
Strategic, tactical and operational. Consideration of organizational structures. Mapping of databases, MIS, EIS, KBS, expert systems, OR modeling systems and simulation, decision analytic systems onto activities within an organization. Extension to other 'non organizational' areas of decision making. Relationship with knowledge management systems.

Unit-II
Studies of human cognition in relation to decision making and the assimilation of information. Cultural issues. Implications for design of decision-making support. Communication issues.

Unit -III
Normative, descriptive and prescriptive analysis: requisite modeling. Contrast with recognition primed decision tools.

Unit -IV

Unit -V
Group decision support systems and decision conferencing. Intelligent decision support systems: tools and applications. Cutting-edge decision support technologies. History, design, implementation: benefits and pitfalls. Deliberative e-democracy and e-participation.

Text Books

Reference Books
2. V.S.Janakiraman and K.Sarukesi, Decision Support Systems, PHI
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
SYLLABUS

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<tr>
<th>Name of Subject</th>
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<td>Cyber Crime and Laws</td>
<td>CS20835(CS)</td>
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**Unit 1: Introduction to Cyber Law**
Evolution of Computer Technology, emergence of Cyber space. Cyber Jurisprudence, Jurisprudence and law, Doctrinal approach, Consensual approach, Real Approach, Cyber Ethics, Cyber Jurisdiction, Hierarchy of courts, Civil and criminal jurisdictions, Cyberspace- Web space, Web hosting and web Development agreement, Legal and Technological Significance of domain Names, Internet as a tool for global access.

**Unit 2: Information technology Act**

**Unit 3: Cyber law and related Legislation**
Patent Law, Trademark Law, Copyright, Software – Copyright or Patented, Domain Names and Copyright disputes, Electronic Data Base and its Protection, IT Act and Civil Procedure Code, IT Act and Criminal Procedural Code, Relevant Sections of Indian Evidence Act, Relevant Sections of Bankers Book Evidence Act, Relevant Sections of Indian Penal Code, Relevant Sections of Reserve Bank of India Act, Law Relating To Employees And Internet, Alternative Dispute Resolution, Online Dispute Resolution (ODR).

**Unit 4: Electronic Business and legal issues**

**Unit 5: Application area**
: business, taxation, electronic payments, supply chain, EDI, E markets, Emerging Trends

**Text Book**
2. Information Security policy &implementation Issues, NIIT, PHI

**Reference books**
1. Cyber CRIME notorious Aspects of the Humans & net Criminals activity in Cyber World Barna Y Dayal D P Dominant Publisher
2. Cyber Crime Impact in the new millennium, Marine R.C. Author press
3. Spam Attack, Cyber Stalking & abuse, Barna Y, Dayal D P Dominant publisher
4. Frauds & Financial crioues in Cyber space, Barna Y, Dayal D P , Dominant publisher
5. Information Security , NIIT: PHI
UNIT-I Introduction to Artificial Neural Networks:
Fundamental concepts-Biological neural network (BNN), artificial neural networks (ANN), comparisons between Brains vs. computer, Von-Neumann computer vs. ANN, Basic model of ANN - network architecture (topologies), learning (training) methods, activation functions, Terminologies of ANN, Evolution of NNs, Learning Rules, McCulloch-Pitts neuron model, Linear separability, Hebb network.

UNIT-II Supervised Learning Based Neural networks:
Introduction, study of architecture and training process of various networks like- Perceptron Networks, Adaptive Linear Neuron (ADALINE), Multiple Adaptive Linear Neurons (MADALINE), Error Back-propagation networks (EBPNs), variations in BPNs, Radial Basis Function Networks (RBFN) etc. applications of BPNs and RBFNs in pattern classification, Case study- NETTALK

UNIT-III Unsupervised Learning Based Neural networks:
Introduction, study of architecture and training process of various networks like- Fixed weight Competitive nets, Kohonen Self Organizing Feature Maps (KSOFM), Counter Propagation Networks (CPNs), Adaptive Theory Resonance (ART) networks etc., Applications of these networks.

UNIT-IV Associative memory networks:

UNIT-V Special Networks:
Introduction , Study of architecture, features and applications of various networks like- Simulated Annealing Network, Boltzmann Machine, Cauchy Machine, Cognitron and Neo-Cognitron networks and Optical neural networks etc.

Text Books:
1. Fundamentals of Neural Networks by Lauren Fausett, Pearson Education.

Reference Books:
1. Neural Networks by James A. Freeman and David M. Strapetuns, Prentice Hall.,
2. Neural Network & Fuzzy System by Bart Kosko, PHI.
3. Principals of Soft Computing by S.N. Sivanandam and S.N. Deepa, Wiley India
4. Neural networks- A classroom Approach by Satish Kumar, TMH
1. Program for configuration Management.
2. Perform SA/SD for the following software.
   • Hotel Automation System
   • Book Shop Automation Software
   • Word processing Software
   • Software Component Cataloguing Software.
3. Design and development of test cases for testing.
4. Writing program for computing Software Metrics
5. Development of Software tool for Halstead Analysis.
6. Perform Cost/Benefit analysis.
7. Illustration of various activities of Software development using MS Project 2000.
8. Lab exercise involving development of various practical applications using software like VB, JDK.
   [Students are to be given a major assignment to be completed using one or more of these tools, Student’s exposure to any CASE tool is desirable]
1. Experiments on Input Techniques: Concepts, instances, attributes
2. Experiments on Output Techniques: Knowledge Representation
3. Classification Experiments - Basic methods
4. Classification Using Decision Trees
5. Classification Using C4.5
6. Classification Using CART
7. Experiments on Clustering Techniques
8. Experiments on Associations Techniques
9. Experiments on Visualization Techniques
10. Experiments on Summarization Techniques
11. Creating a Data Warehouse – Defining Dimension and Fact Table
12. Implementation of Star Data Warehouse Schema
13. Implementation of Snowflake Data Warehouse Schema