### IV YEAR II SEMESTER

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<tr>
<th>Code</th>
<th>Subject</th>
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<td>Management Science</td>
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<td>ELECTIVE III</td>
<td>Web Services</td>
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<td>Semantic Web and Social Networks</td>
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<td>Multimedia &amp; Rich Internet Applications</td>
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<td><strong>Information Security Incident Response &amp; Management (Security Analyst-3)</strong></td>
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<td>ELECTIVE – IV</td>
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Note: All End Examinations (Theory and Practical) are of three hours duration.

T - Tutorial  L - Theory  P - Practical  D - Drawing  C - Credits

**For registering for Predictive Analytics the prerequisite is Big Data Analytics.**

**For registering for Information Security Incident Response & Management the prerequisite is Information Security Assessments & Audits.**

**Note:**

1) Qualification pack for ASSOCIATE ANALYTICS includes the following three subjects.

   1. Introduction to Analytics
   2. Big Data Analytics
   3. Predictive Analytics

2) Qualification pack for SECURITY ANALYST includes the following three subjects.

   1. Information Security Management,
   2. Information Security Assessments & Audits.
   3. Information Security Incident Response & Management
Objectives:
This course is intended to familiarise the students with the framework for the managers and leaders available for understanding and making decisions relating to issues related organisational structure, production operations, marketing, Human resource Management, product management and strategy.

UNIT -I:

UNIT -II:

UNIT -III:

UNIT -IV:
Project Management (PERT/CPM): Network Analysis, Programme
Evaluation and Review Technique (PERT), Critical Path Method (CPM), Identifying critical path, Probability of Completing the project within given time, Project Cost Analysis, Project Crashing (simple problems).

UNIT - V:


TEXT BOOKS:
1. Stoner, Freeman, Gilbert, Management, 6th Ed, Pearson Education, New Delhi, 2004

REFERENCE BOOKS:

OUTCOMES:

By the end of the course, the student will be in a position to

- Plan an organisational structure for a given context in the organisation
- carry out production operations through Work study
- understand the markets, customers and competition better and price the given products appropriately,
- ensure quality for a given product or service
- plan and control the HR function better
- plan, schedule and control projects through PERT and CPM
- evolve a strategy for a business or service organisation

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
IV Year B.Tech. CSE-II Sem

(A80551) WEB SERVICES
(Elective – III)

OBJECTIVES:
- To understand the details of web services technologies like WSDL, UDDI, SOAP
- To learn how to implement and deploy web service client and server
- To explore interoperability between different frameworks

UNIT-I

Evolution and Emergence of Web Services - Evolution of distributed computing, Core distributed computing technologies—client/server, CORBA, JAVA RMI, Microsoft DCOM, MOM, Challenges in Distributed Computing, role of J2EE and XML in distributed computing, emergence of Web Services and Service Oriented Architecture (SOA).

Introduction to Web Services – The definition of web services, basic operational model of web services, tools and technologies enabling web services, benefits and challenges of using web services.

Web Services Architecture – Web services Architecture and its characteristics, core building blocks of web services, standards and technologies available for implementing web services, web services communication models, basic steps of implementing web services.

UNIT- II

Fundamentals of SOAP – SOAP Message Structure, SOAP encoding, Encoding of different data types, SOAP message exchange models, SOAP communication and messaging, Java and Axis, limitations of SOAP.

UNIT- III

Describing Web Services – WSDL – WSDL in the world of Web Services, Web Services life cycle, anatomy of WSDL definition document, WSDL bindings, WSDL Tools, limitations of WSDL.

UNIT- IV

Discovering Web Services – Service discovery, role of service discovery in a SOA, service discovery mechanisms, UDDI – UDDI registries, uses of UDDI Registry, Programming with UDDI, UDDI data structures, Publishing API, Publishing, searching and deleting information in a UDDI Registry, limitations of UDDI.
UNIT V


TEXT BOOK:
1. Developing Java Web Services, R. Nagappan, R. Skoczylas, R.P. Sriganesh, Wiley India.

REFERENCE BOOKS:
1. Java Web Service Architecture, James McGovern, Sameer Tyagi et al., Elsevier
3. Java Web Services, D.A. Chappell & T. Jewell, O’Reilly, SPD.

Outcomes:
- Basic details of WSDL, UDDI, SOAP
- Implement WS client and server with interoperable systems

UNIT-I


Machine Intelligence, Artificial Intelligence, Ontology, Inference engines, Software Agents, Berners-Lee www, Semantic Road Map, Logic on the semantic Web.

UNIT-II


Ontology Engineering, Constructing Ontology, Ontology Development Tools, Ontology Methods, Ontology Sharing and Merging, Ontology Libraries and Ontology Mapping.

UNIT-III

Logic, Rule and Inference Engines. Semantic Web applications and services, Semantic Search, e-learning, Semantic Bioinformatics, Knowledge Base.

UNIT-IV

XML Based Web Services, Creating an OWL-S Ontology for Web Services, Semantic Search Technology, Web Search Agents and Semantic Methods, What is social Networks analysis, development of the social networks analysis, Electronic Sources for Network Analysis – Electronic Discussion networks.

UNIT-V

Blogs and Online Communities, Web Based Networks. Building Semantic Web Applications with social network features.
TEXT BOOKS:

REFERENCE BOOKS:
4. Programming the Semantic Web, T. Segaran, C. Evans, J. Taylor, O'Reilly, SPD.

Outcomes:
- Ability to understand and knowledge representation for the semantic web.
- Ability to create ontology.
- Ability to build blogs and social networks.

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
IV Year B.Tech. CSE-II Sem
(A80537) SCRIPTING LANGUAGES
(Elective - III)

Objectives:
The course demonstrates an in-depth understanding of the tools and the scripting languages necessary for design and development of applications dealing with Bio-information/ Bio-data. The instructor is advised to discuss examples in the context of Bio-data/ Bio-information application development.

UNIT - I
Introduction to PERL and Scripting: Scripts and Programs, Origin of Scripting, Scripting Today, Characteristics of Scripting Languages, Uses for Scripting Languages, Web Scripting, and the universe of Scripting Languages. PERL- Names and Values, Variables, Scalar Expressions, Control Structures, arrays, list, hashes, strings, pattern and regular expressions, subroutines.

UNIT - II
Advanced perl: Finer points of looping, pack and unpack, file system, eval, data structures, packages, modules, objects, interfacing to the operating system, Creating Internet ware applications, Dirty Hands Internet Programming, security issues.

PHP Basics: PHP Basics- Features, Embedding PHP Code in your Web pages, Outputting the data to the browser, Data types, Variables, Constants, expressions, string interpolation, control structures, Function, Creating a Function, Function Libraries, Arrays, strings and Regular Expressions.

UNIT - III
Advanced PHP Programming: PHP and Web Forms, Files, PHP Authentication and Methodologies - Hard Coded, File Based, Database Based, IP Based, Login Administration, Uploading Files with PHP, Sending Email using PHP, PHP Encryption Functions, the Mcrypt package, Building Web sites for the World.

UNIT - IV
TCL: TCL Structure, syntax, Variables and Data in TCL, Control Flow, Data Structures, input/output, procedures, strings, patterns, files, Advance TCL- eval, source, exec and uplevel commands, Name spaces, trapping errors, event driven programs, making applications internet aware, Nuts and Bolts Internet Programming, Security Issues, C Interface.
**UNIT - V**

*Python*: Introduction to Python language, python-syntax, statements, functions, Built-in-functions and Methods, Modules in Python, Exception Handling.


**TEXT BOOKS:**


**REFERENCE BOOKS:**

2. *Programming Python*, M.Lutz, SPD.
4. *PHP 5.1*, J.Bayross and S.Shah, The X Team, SPD.
8. *Programming Perl*, Larry Wall, T.Christiansen and J.Orwant, O'Reilly, SPD.
12. *PHP Programming solutions*, V.Vaswani, TMH.

**Outcomes:**

- Ability to understand the differences between scripting languages.
- Ability to apply your knowledge of the weaknesses of scripting languages to select implementation.
- Master an understanding of python especially the object oriented concepts.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**

**IV Year B.Tech. CSE-II Sem**

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**(A 80547) MULTIMEDIA & RICH INTERNET APPLICATIONS**

**(Elective – III)**

**Objectives:**

This course aims to further develop students' competency in producing dynamic and creative graphic solutions for multimedia productions. It provides students with the basic concepts and techniques of interactive authoring. It also introduces students with the advanced scripting skills necessary for implementing highly interactive, rich internet applications using multimedia and authoring tools. Students will develop aesthetic value and competencies in multimedia authoring. Artistic visual style and layout design are stressed, as well as the editing and integration of graphic images, animation, video and audio files. The course allows students to master industry-wide software and technologies to create highly interactive, rich internet applications.

**UNIT - I**


**UNIT - II**

Fundamental concepts in video and digital audio: Types of video signals, analog video, digital video, digitization of sound, MIDI, quantization and transmission of audio.


**UNIT III**

Basic Video compression techniques, Case study: MPEG Video Coding I, Basic Audio compression techniques, Case study: MPEG Audio compression.

**Web 2.0**: What is web 2.0, Search, Content Networks, User Generated Content, Blogging, Social Networking, Social Media, Tagging, Social Marking, Rich Internet Applications, Web Services, Mashups, Location Based Services, XML, RSS, Atom, JSON, and VoIP, Web 2.0 Monetization and Business Models, Future of the Web.

**UNIT - IV**

Rich Internet Applications (RIAs) with Adobe Flash: Adobe Flash Introduction, Flash Movie Development, Learning Flash with Hand-on
Examples, Publish your flash movie, Creating special effects with Flash, Creating a website splash screen, action script, web sources.


**UNIT - V**


**TEXT BOOKS:**

1. Fundamentals of Multimedia by Ze-Nian Li and Mark S. Drew PHI Learning, 2004

**REFERENCE BOOKS:**


15. Mastering Dojo, R. Gill, C. Riecke, and A. Russell, SPD.

**Outcomes:**

- Ability to create and design rich internet applications.
- Ability to develop different multimedia tools to produce web based and independent user interfaces.
Predictive Analytics (Associate Analytics - III)
(Elective-II)

Unit I
Introduction to Predictive Analytics & Linear Regression (NOS 2101):
What and Why Analytics, Introduction to Tools and Environment, Application of Modelling in Business, Databases & Types of data and variables, Data Modelling Techniques, Missing imputations etc.
Need for Business Modelling, Regression – Concepts, Blue property-assumptions-Least Square Estimation, Variable Rationalization, and Model Building etc.

Unit II
Logistic Regression (NOS 2101):
Model Theory, Model fit Statistics, Model Conclusion, Analytics applications to various Business Domains etc.
Regression Vs Segmentation – Supervised and Unsupervised Learning, Tree Building – Regression, Classification, Overfitting, Pruning and complexity, Multiple Decision Trees etc.

Unit III
Objective Segmentation(NOS 2101):
Regression Vs Segmentation – Supervised and Unsupervised Learning, Tree Building – Regression, Classification, Overfitting, Pruning and complexity, Multiple Decision Trees etc.
Develop Knowledge, Skill and Competences (NOS 9005)
Introduction to Knowledge skills & competences, Training & Development, Learning & Development, Policies and Record keeping, etc.

Unit IV
Time Series Methods /Forecasting, Feature Extraction (NCS 2101):
Arima, Measures of Forecast Accuracy, STL approach, Extract features from generated model as Height, Average, Energy etc and Analyze for prediction.
Project

Unit V
Working with Documents (NOS 0703):

Text Book:
1. Student's Handbook for Associate Analytics-III.

Reference Book:
1. Gareth James • Daniela Witten • Trevor Hastie Robert Tibshirani. An Introduction to Statistical Learning with Applications in R
Jawaharlal Nehru Technological University Hyderabad

IV Year B.Tech. CSE -II Sem

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INFORMATION SECURITY INCIDENT RESPONSE & MANAGEMENT (SECURITY ANALYST – III)
(Elective-II)

Unit I
Managing Information Security Services:
Configuring Network Devices, Identifying Unauthorized Devices, Testing the Traffic Filtering Devices, Configuring
Router, Configuring Modes — Router/Global/Interface/Line/Privilege EXEC/ROM/User EXEC, Configuring a
banner/Firewall/Bastion Host/VPN server etc.

Unit II
Troubleshooting Network Devices and Services:
Introduction & Methodology of Troubleshooting, Troubleshooting of Network Communication-Connectivity, Network
Devices-Network Slowdowns-Systems-Modems etc.

Unit III
Information Security Incident Management & Data Backup:
Information Security Incident Management overview-Handling-Response, Incident Response Roles and
Responsibilities, Incident Response Process etc.
Data Back introduction, Types of Data Backup and its techniques, Developing an Effective Data Backup Strategy
and Plan, Security Policy for Back Procedures.

Unit IV
Log Correlation:
Computer Security Logs, Configuring & Analyzing Windows Logs, Log Management-Functions & Challenges,
Centralized Logging and Architecture, Time Synchronization – NTP/NIST etc.
Develop Knowledge Skill and competences (NOS 5005)

Unit V
Handling Network Security Incidents:
Network Reconnaissance Incidents, Network Scanning Security Incidents, Network Attacks and Security
Incidents, Detecting DoS Attack, DoS Response Strategies, Preventing/stopping a DoS Incident etc.
Handling Malicious Code Incidents:
Incident Handling Preparation, Incident Prevention, Detection of Malicious Code, Containment Strategy,
Evidence Gathering and Handling, Eradication and Recovery, Recommendations etc.
Project.

TEXT BOOKS:
1. Managing Information Security Risks, The Octave Approach by Christopher Alborts, and Audrey Dorofee

REFERENCES:
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

IV Year B.Tech. CSE-II Sem

(A80542) AD HOC AND SENSOR NETWORKS

(Effective – IV)

Objectives:
- To understand the concepts of sensor networks
- To understand the MAC and transport protocols for adhoc networks
- To understand the security of sensor networks
- To understand the applications of adhoc and sensor networks

UNIT- I

Introduction to Ad Hoc Wireless Networks: Characteristics of MANETs, Applications of MANETs, Challenges.


UNIT- II

Data Transmission in MANETs: The Broadcast Storm, Multicasting, Geocasting

TCP over Ad Hoc Networks: TCP Protocol overview, TCP and MANETs, Solutions for TCP over Ad Hoc

UNIT- III

Basic of Wireless Sensors and Applications: The Mica Mote, Sensing and Communication Range, Design Issues, Energy consumption, Clustering of Sensors, Applications

Data Retrieval in Sensor Networks: Classification of WSNs, MAC layer, Routing layer, High-level application layer support, Adapting to the inherent dynamic nature of WSNs.

UNIT- IV


UNIT- V

Operating System – TinyOS

Imperative Language: nesC, Dataflow style language: TinyGALS, Node-Level Simulators, ns-2 and its sensor network extension, TOSSIM

TEXT BOOKS:

REFERENCE BOOKS:

Outcomes:
- Ability to understand the concept of ad-hoc and sensor networks.
- Ability to design and implement sensor network protocols.
- Ability to set up and evaluate measurements of protocol performance in sensor networks.
Impact of downtime. Differentiate between business continuity (BC) and disaster recovery (DR), RTO and RPO. Identify single points of failure in a storage infrastructure and list solutions to mitigate these failures.

UNIT- IV
Architecture of backup/recovery and the different backup/recovery topologies, replication technologies and their role in ensuring information availability and business continuity. Remote replication technologies and their role in providing disaster recovery and business continuity capabilities.

UNIT- V
Identify key areas to monitor in a data center. Industry standards for data center monitoring and management. Key metrics to monitor for different components in a storage infrastructure. Key management tasks in a data center. Information security. Critical security attributes for information systems, Storage security domains. List and analyzes the common threats in each domain.

Virtualization technologies, block-level and file-level virtualization technologies and processes.

Case Studies:
The technologies described in the course are reinforced with EMC examples of actual solutions.

Realistic case studies enable the participant to design the most appropriate solution for given sets of criteria.

TEXT BOOK:
1. EMC Corporation, Information Storage and Management, Wiley.

REFERENCE BOOKS:

Outcomes:
- Ability to demonstrate the storage area networks and their products
- Ability to provide the mechanisms for the backup/recovery.

UNIT- I
Review data creation and the amount of data being created and understand the value of data to a business, challenges in data storage and data management. Elements of data, Core elements of a data center infrastructure, role of each element in supporting business activities.

Hardware and software components of the host environment, Key protocols and concepts used by each component, Physical and logical components of a connectivity environment, Major physical components of a disk drive and their function, logical constructs of a physical disk, access characteristics, and performance Implications.

UNIT- II
Concept of RAID and its components, Different RAID levels and their suitability for different application environments: RAID 0, RAID 1, RAID 3, RAID 4, RAID 5, RAID 0+1, RAID 1+0, RAID 6, Compare and contrast integrated and modular storage systems, High-level architecture and working of an intelligent storage system.

Evolution of networked storage, Architecture, components, and topologies of FC-SAN, NAS, and IP-SAN, Benefits of the different networked storage options, Understand the need for long-term archiving solutions and describe how CAS fulfills the need, Understand the appropriateness of the different networked storage options for different application environments.

UNIT- III
List reasons for planned/unplanned outages and the impact of downtime,
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
IV Year B.Tech, CSE-II Sem

(A80543) DATABASE SECURITY
(Elective-IV)

Objectives:
- To learn the security of databases
- To learn the design techniques of database security
- To learn the secure software design

UNIT-I
Introduction: Introduction to Databases Security Problems in Databases Security Controls Conclusions


UNIT- II


UNIT- III


UNIT- IV

UNIT- V

TEXT BOOKS:
1. Database Security by Castano Pearson Edition (1/e)

REFERENCE BOOK:
1. Database security by alfred basta, melissa zgola, CENGAGE learning.

Outcomes:
- Ability to carry out a risk analysis for large database.
- Ability to set up, and maintain the accounts with privileges and roles.
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
IV Year B.Tech. CSE-II Sem

(A80439) EMBEDDED SYSTEMS
(Elective - IV)

Objectives:
- Design embedded computer system hardware
- Design, implement, and debug multi-threaded application software that operates under real-time constraints on embedded computer systems
- Use and describe the implementation of a real-time operating system on an embedded computer system
- Formulate an embedded computer system design problem including multiple constraints, create a design that satisfies the constraints, and implement the design in hardware and software, and measure performance against the design constraints
- Create computer software and hardware implementations that operate according to well-known standards
- Organize and write design documents and project reports
- Organize and make technical presentations that describe a design.

UNIT - I

The 8051 Architecture: Introduction, 8051 Microcontroller Hardware, Input/Output Ports and Circuits, External Memory, Counter and Timers, Serial data Input/Output, Intermits. (Chapter 3 from Text Book 2, Ayala).

UNIT - II
Basic Assembly Language Programming Concepts: The Assembly Language Programming Process, Programming Tools and Techniques, Programming the 8051, Data Transfer and Logical Instructions. (Chapters 4, 5 and 6 from Text Book 2, Ayala).

Arithmetic Operations, Decimal Arithmetic, Jump and Call Instructions, Further Details on Interrupts. (Chapter 7 and 8 from Text Book 2, Ayala)

UNIT - III
Applications: Interfacing with Keyboards, Displays, D/A and A/D

Conversions, Multiple Interrupts, Serial Data Communication. (Chapter 10 and 11 from Text Book 2, Ayala).

Introduction to Real-Time Operating Systems: Tasks and Task States, Tasks and Data, Semaphores and Data, Message Queues, Mailboxes and Pipes, Timer Functions, Events, Memory Management, Interrupt Routines in an RTOS Environment. (Chapter 6 and 7 from Text Book 3, Simon).

UNIT - IV

UNIT - V
Introduction to advanced architectures: ARM and SHARC, Processor and memory organization and Instruction level parallelism; Networked embedded systems: Bus protocols, I2C bus and CAN bus, Internet-Enabled Systems, Design Example-Elevator Controller. (Chapter 8 from Text Book 1, Wolf).

TEXT BOOKS:

REFERENCE BOOKS:
1. Embedding system building blocks, Labrosse, via CMP publishers.
2. Embedded Systems, Raj Kamal, TMH.
3. Micro Controllers, Ajay V Deshmukh, TMH.
5. Microcontrollers, Raj Kamal, Pearson Education.
6. An Embedded Software Primer, David E. Simon, Pearson Education.

Outcomes:
- Ability to understanding of general system theory and how this applies to embedded system.
- Ability to build a prototype circuit on breadboard using 8051 microcontroller.
(A 80087) INDUSTRY ORIENTED MINI PROJECT

(A 80089) SEMINAR

(A 80088) PROJECT WORK

(A 80090) COMPREHENSIVE VIVA