

SCHOOL OF ENGINEERING
SRI SATYA SAI UNIVERSITY OF TECHNOLOGY AND MEDICAL SCIENCES
Outcome based Curriculum for
Undergraduate Degree Courses in Engineering & Technology
Department of Information Technology

ITA-801 Web Technology

ITA-801	WEB Technology	3L:0T:2P	4 credits	5Hrs/Week
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OBJECTIVE :-

The goals of the course are as follows: To be able to analyze and design comprehensive systems for the creation, dissemination, storage, retrieval, and use of electronic records and documents

OUTCOME:-

Students should be able to:

- Employ techniques to analyze and evaluate software architectures on a real-world large-scale web-based software systems.
- Create and document a reference architecture for a non-trivial Webbased technological product.
- Present findings of case study analysis of software architectures of a family of large-scale web-based software systems.
- Envision an innovative product for a wicked problem and develop an architecture for the product that utilizes service-oriented computing technologies
- Write a research-in-progress paper on a Web engineering topic that utilizes Design Science Research methodology and adheres to appropriate academic standards.

UNIT-I

(8 Hr.)

Web Engineering: Introduction, History, Evolution and Need, Time line, Motivation, Categories & Characteristics of Web Applications, Web Engineering Models, Software Engineering v/s Web Engineering. World Wide Web: Introduction to TCP/IP and WAP, DNS, Email, TelNet, HTTP and FTP. Browser and search engines: Introduction, Search fundamentals, Search strategies, Directories search engines and Meta search engines, Working of the search engines. Web Servers: Introduction, Features, caching, case study-IIS, Apache.

UNIT II

(9 Hr.)

Information Architecture: Role, Collaboration and Communication, Organizing Information, Organizational Challenges, Organizing Web sites parameters and Intranets Website Design: Development, Development phases, Design issues, Conceptual Design, High-Level Design, Indexing the Right Stuff, Grouping Content. Architectural Page Mockups, Design Sketches, Navigation Systems. Searching Systems, Good & bad web design, Process of Web Publishing. Web-site enhancement, submission of website to search engines. Web security: issues, security audit. Web effort estimation, Productivity Measurement, Quality usability and reliability. Requirements Engineering for Web Applications: Introduction, Fundamentals, Requirement Source, Type, Notations Tools. Principles Requirements Engineering Activities, Adapting RE Methods to Web Application.

UNIT III

(8 Hr.)

Technologies for Web Applications I: HTML and DHTML: Introduction, Structure of documents, Elements, Linking, Anchor Attributes, Image Maps, Meta Information, Image Preliminaries, Layouts, Backgrounds, Colors and Text, Fonts, Tables, Frames and layers, Audio and Video Support with HTML Database integration, CSS, Positioning with Style sheets, Forms Control, Form Elements. Introduction to CGI, PERL, JAVA SCRIPT, JSP,PHP, ASP & AJAX. Cookies: Creating and Reading

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UNIT IV

(7 Hr.)

Technologies for Web Applications II: XML: Introduction, HTML Vs XML, Validation of documents, DTD, Ways to use, XML for data files, Embedding XML into HTML documents, Converting XML to HTML for Display, Displaying XML using CSS and XSL, Rewriting HTML as XML, Relationship between HTML, SGML and XML, web personalization, Semantic web, Semantic Web Services, Ontology

UNIT V

(8 Hr.)

E-Commerce: Business Models, Infrastructure, Creating an E-commerce WebSite, Environment and Opportunities. Modes & Approaches, Marketing & Advertising Concepts. Electronic Publishing issues, approaches, legalities and technologies, Secure Web document, Digital Signatures and Firewalls, Cyber crime and laws, IT Act. Electronic Cash, Electronic Payment Systems: RTGS, NEFT, Internet Banking, Credit/Debit Card. Security: Digital Certificates & Signatures, SSL, SET, 3D Secure Protocol.

Recommended Books:

- 1.Roger S.Pressman, David Lowe, "Web Engineering", Tata Mc Graw Hill Publication, 2007
- 2.Achyut S Godbole and Atul Kahate, "Web Technologies", Tata McGraw Hill
- 3.Gopalan N P , Akilandeswari, "Web Technology: A Developer s Perspective", PHI
- 4.Neil Gray, "Web server Programming" Wiley
- 5.Chris Bates, "Web Programming: Building Internetapplications" Wiley
- 6.Moller, "An Introduction to XML and Web Technologies", Pearson Education New Delhi, 2009
- 7."Web Technologies: Black Book", Kogent, Dreamtech
- 8.Internet & World Wide Web How to Program, Pearson education, 3rd edition, by: H.M. Deitel, P.J. Deitel, A.B. Goldberg.
- 9.C. Xavier, "Web Technology & Design ", Tata McGraw Hill.
- 10.Ivan Bay Ross, "HTML,DHTML,Java script,Perl CGI" , BPB

LIST OF EXPERIMENTS:

- 1.Program to show HTML Page Structure.
- 2.Program to show the Impact of HTML Headings.
- 3.Program to show the id attribute in HTML page.
- 4.Program to show The HTML <style> Element
- 5.Create The IT Department website home page for various tags.
- 6.Program to Make a hyperlink of an imageIN HTML.
- 7.Program to implement table in HTML.
- 8.Program for HTML Document, which provides a form that collects names and phone numbers.
- 9.JavaScript program to show factorial of a number.
- 10.Design a Home Page for IT Department OIST using various HTML Tags.

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**ITA-802(A) Artificial
Intelligence**

ITA-802(A)	ARTIFICIAL INTELLIGENCE	3L:0T:0P	3 credits	3 Hrs/Week
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OBJECTIVE:-

It presents the concepts of Artificial Intelligence and the participants will get to work in the areas of Machine learning, Deep Learning, implement methods to solve problems using Artificial Intelligence and Natural Language Processing, etc.

OUTCOME:-

This course is designed in synchronization with the industry to provide the participants in-depth knowledge and skills required by AI fields around the globe. It provides comprehensive knowledge about the fundamental principles, methodologies and industry practices in AI.

- Fundamentals of neural networks and fuzzy logic.
- Supervised learning and unsupervised learning.
- Neurodynamical models

UNIT-I

(9 Hr.)

Introduction: Artificial Intelligence, AI Problems, AI Techniques, The Level of the Model, Criteria For Success. Defining the Problem as a State Space Search, Problem Characteristics, Production Systems, Search: Issues in The Design of Search Programs, Un-Informed Search, BFS, DFS; Heuristic Search Techniques: Generate-And-Test, Hill Climbing, Best-First Search, A*Algorithm, Problem Reduction, AO*Algorithm, Constraint Satisfaction, Means-Ends Analysis.

UNIT:-II

(8 Hr.)

Knowledge Representation: Procedural Vs Declarative Knowledge, Representations & Approaches to Knowledge Representation, Forward Vs Backward Reasoning, Matching Techniques, Partial Matching, Fuzzy Matching Algorithms and RETE Matching Algorithms; Logic Based Programming-AI Programming languages: Overview of LISP, Search Strategies in LISP, Pattern matching in LISP , An Expert system Shell in LISP, Over view of Prolog, Production System using Prolog

UNIT-III

(8 Hr.)

Reasoning under Uncertainty: Introduction to Non-Monotonic Reasoning, Truth Maintenance Systems, Logics for Non-Monotonic Reasoning, Model and Temporal Logics; Statistical Reasoning: Bayes Theorem, Certainty Factors and Rule-Based Systems, Bayesian Probabilistic Inference, Bayesian Networks, Dempster-Shafer Theory, Fuzzy Logic: Crisp Sets ,Fuzzy Sets, Fuzzy Logic Control, Fuzzy Inferences & Fuzzy Systems.

UNIT-IV

(7 Hr.)

Overview of Computational Intelligence and Artificial Evolution , Artificial Neural Networks (ANNs), Introduction to ANNs, Learning in ANNs, Supervised Learning in ANNs, Unsupervised Learning in ANNs, Reinforcement Learning in ANNs, Deep Learning in ANNs, Performance of ANNs.

UNIT-V

(8 Hr.)

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Artificial Evolution, Fundamentals of Evolution, Introduction to Evolutionary Computation (EC), Common EC Methods, Genetic Algorithms, Genetic Programming, Evolutionary Programming, Evolution Strategies, Grammatical Evolution, Cultural Evolution, Introduction to Artificial Life (ALife), Artificial Neural Networks and Artificial Evolution, Introduction to Neuroevolution, Topology Evolution, Learning Rule Evolution, Deep Neuroevolution.

TEXTBOOKS:-

1. Artificial Intelligence, George F Luger, Pearson Education Publications
2. Artificial Intelligence, Elaine Rich and Knight, Mcgraw-Hill Publications
3. Computational Intelligence: An Introduction, Second Edition, Andries P. Engelbrecht, 2007,
4. Bio-Inspired Artificial Intelligence: Theories, Methods, and Technologies, Dario Floreano and Claudio Mattiussi, 2008, The MIT Press
5. Writing for Computer Science, Third Edition, Justin Zobel, 2014, Springer

REFERANCES:-

1. Introduction To Artificial Intelligence & Expert Systems, Patterson, PHI
2. Multi Agent systems-a modern approach to Distributed Artificial intelligence, Weiss.G, MIT Press.
3. Artificial Intelligence : A modern Approach, Russell and Norvig, Printice Hall

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ITA-802(B)

Network Management

ITA-802(B)	NETWORK MANAGEMENT	3L:0T:0P	3 credits	3 Hrs/Week
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OBJECTIVE:-

Network management and security are essential factors in the reliable, efficient, and secure operation of networks. As businesses become increasingly dependent on networking services, keeping these services running and secure becomes synonymous with keeping the business running. This course provides a thorough introduction to network management technologies and standards as well as to a wide variety of techniques for evaluating, monitoring, and defending the security of computer networks and systems.

OUTCOME:-

On the successful completion of the course, students will be able to

- Examine the need of security for the given network scenario.
- Criticize the preventive measures to secure routing and switching.
- Infer the design of firewall, VPN and IDS / IPS for the given network.

UNIT-I

(8 Hr.)

Network Management Framework, Network Based Managements, Evolution of Network Management: SGMP, CMIP, SNMP. Network Implementation and Management Strategies, Network Management Categories: Performance Management, Fault Management, Configuration Management, Security Managements, Accounting Managements. Network Management Configuration: Centralized Configuration, Distributed Configuration, Selected Management Strategy

UNIT:-II

(8 Hr.)

Management Information Base (MIB), Structure of Management Information, NMS Presentation of the SMI, NMS Meter-ware Network View, Remote Monitoring (RMON), RMON Group. Desktop Management: Desktop Management Interface (DMI), DMI Architecture, DMI Browser, DMI/SNMP Mapping, Desktop SNMP Extension Agents, Setting up LAN Access, SNMP Configuration.

UNIT-III

(9 Hr.)

Introduction, layering, OSI Layering, TCP/IP Layering, Protocols & Standards, Internet standards, Internet administration, Internet Addresses, Internet protocol: introduction, IP header, IP routing, subnet addressing, subnet mask, special case of IP addresses, Comparative Study of IPV4 & IPV6, port numbers Address Resolution Protocol, ARP packet format, Proxy ARP, ARP command, ARP Example, Reverse Address Resolution Protocol (RARP): Introduction, RARP Packet format, RARP Examples, RARP server design

UNIT-IV

(8 Hr.)

Delivery and Routing of IP Packets, Routing Methods, Static versus Dynamic Routing, Routing table and Routing Module, Classless Addressing: CIDR. Internet Protocol (IP), Datagram, Fragmentation, Options, IP Package. Interior

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and Exterior Routing, Routing information protocol (RIP), Open shortest path first protocol (OSPF), BGP, GGP. Private Networks. Virtual Private Network (VPN), Network Address Translation (NAT).

UNIT-V

(7 Hr.)

Internet Control Message Protocols (ICMP):-Types of message, message format, error reporting, query, checksum, ICMP Package. IGMP, IGMP Message and its Operation, IGMP Package. Transmission control protocol, Process-to-Process Communication, TCP Services Flow Control, TCP Timers. TCP Operation, TCP Package, Application layers protocol, Telnet Protocol, File Transfer Protocol (FTP), Simple Mail Transfer Protocol (SMTP), X-Window system protocol, Remote procedure call, and Network file system.

REFERENCES:

1. Forouzan, TCP/IP Protocol Suite 4th edition, TMH
2. Stevens, TCP/IP Illustrated Volume-I, Pearson
3. J. Richard Burkey, Network Management Concept and Practice, PHI

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ITA-803(A)

Internet Of Things

ITA-803(A)	INTERNET OF THINGS	3L:0T:0P	3 credits	3 Hrs/Week
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OBJECTIVE:

Students will be explored to the interconnection and integration of the physical world and the cyber space. They are also able to design & develop IOT Devices.

OUTCOME:

1. Able to understand the application areas of IOT .
2. Able to realize the revolution of Internet in Mobile Devices, Cloud & Sensor Networks
3. Able to understand building blocks of Internet of Things and characteristics.

UNIT –I

(7 Hr.)

Introduction:Definition, Characteristics of IOT, IOT Conceptual framework, IOT Architectural view, Physical design of IOT, Logical design of IOT, Application of IOT.

UNIT–II

(8 Hr.)

Machine-to-machine (M2M), SDN (software defined networking) and NFV(network function virtualization) for IOT, data storage in IOT, IOT Cloud Based Services.

UNIT–III

(9 Hr.)

Design Principles for Web Connectivity: Web Communication Protocols for connected devices, Message Communication Protocols for connected devices, SOAP, REST, HTTP Restful and Web Sockets. Internet Connectivity Principles,Internet Connectivity, Internet based communication, IP addressing in IOT, Media Access control.

UNIT–IV

(8 Hr.)

Sensor Technology, Participatory Sensing, Industrial IOT and Automotive IOT, Actuator, Sensor data Communication Protocols, Radio Frequency Identification Technology, Wireless Sensor Network Technology.

UNIT–V

(8 Hr.)

IOT Design methodology: Specification requirement, process, model, service, functional & operational view, IOT Privacy and security solutions, Raspberry Pi & arduino devices. IOT Case studies, smart city streetlights control & monitoring.

REFERENCES:

1. Rajkamal, "Internet of Things", Tata McGraw Hill publication.
2. Vijay Madiseti and Arshdeep Bahga, "Internet of things(A-Hand-on-Approach)" 1st Edition ,Universal Press.
3. Hakima Chaouchi "The Internet of Things: Connecting Objects", Wiley publication.
4. Charless Bell "MySQL for the Internet of things", Apress publications

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ITA-803(B)
MOBILE COMPUTING

ITA-803(B)	MOBILE COMPUTING	3L:0T:0P	3 credits	3Hrs/Week
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OBJECTIVE:-

The objective of this course is to learn about the concepts and principles of mobile computing; to explore both theoretical and practical issues of mobile computing; to develop skills of finding solutions and building software for mobile computing applications

OUTCOME:-

Student will be able to:

- ✓ Describe the basic concepts and principles in mobile computing
- ✓ Understand the concept of Wireless LANs, PAN, Mobile Networks, and Sensor Networks
- ✓ Explain the structure and components for Mobile IP and Mobility Management
- ✓ Understand positioning techniques and location-based services and applications
- ✓ Describe the important issues and concerns on security and privacy Professional Skill
- ✓ Design and implement mobile applications to realize location-aware computing
- ✓ Design algorithms for location estimations based on different positioning techniques and platforms
- ✓ Acquire the knowledge to administrate and to maintain a Wireless LAN Attitude
- ✓ Recognize the important issues and concerns on security and privacy

UNIT-I

(7 Hr.)

INTRODUCTION: Introduction to Mobile Computing –Applications of Mobile Computing-Generations of Mobile Communication Technologies-Multiplexing –Spread spectrum -MAC Protocols –SDMA-TDMA-FDMA-CDMA

UNIT-II

(9 Hr.)

MOBILE TELECOMMUNICATION SYSTEM: Introduction to Cellular Systems –GSM –Services & Architecture – Protocols –Connection Establishment –Frequency Allocation –Routing –Mobility Management –Security –GPRS-UMTS –Architecture –Handover –Security

UNIT-III

(8 Hr.)

MOBILE NETWORK LAYER: Mobile IP –DHCP –AdHoc–Proactive protocol-DSDV, Reactive Routing Protocols – DSR, AODV , Hybrid routing –ZRP, Multicast Routing-ODMRP, Vehicular Ad Hoc networks (VANET) –MANET Vs VANET –Security.

UNIT-IV

(8 Hr.)

MOBILE TRANSPORT AND APPLICATION LAYER: Mobile TCP–WAP –Architecture –WDP –WTLS –WTP – WSP –WAE –WTA Architecture –WML

UNIT-V

(8 Hr.)

MOBILE TRANSPORT AND APPLICATION LAYER: Mobile Device Operating Systems –Special Constraints & Requirements –Commercial Mobile Operating Systems –Software Development Kit: iOS, Android, BlackBerry, Windows Phone –M Commerce –Structure –Pros & Cons –Mobile Payment System –Security Issues

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TEXT BOOKS:

1. Jochen Schiller, —Mobile Communications, PHI, Second Edition, 2003.
2. Prasant Kumar Pattnaik, Rajib Mall, —Fundamentals of Mobile Computing, PHI Learning Pvt.Ltd, New Delhi – 2012

REFERENCES:

1. Dharma Prakash Agarwal, Qing and An Zeng, “Introduction to Wireless and Mobile systems”, Thomson Asia Pvt Ltd, 2005.
2. Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, —Principles of Mobile Computing, Springer, 2003.
3. William.C.Y.Lee,—Mobile Cellular Telecommunications-Analog and Digital Systems, Second Edition, TataMcGraw Hill Edition, 2006.
4. C.K.Toh, —AdHoc Mobile Wireless Networks, First Edition, Pearson Education, 2002.
5. Android Developers : <http://developer.android.com/index.html>
6. Apple Developer : <https://developer.apple.com/>
7. Windows Phone DevCenter : <http://developer.windowsphone.com>
8. BlackBerry Developer : <http://developer.blackberry.com>

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ITA-804

Project Stage –II

ITA-804	PROJECT STAGE -II	0L:0T:16P	8 credits	16Hrs/Week
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Project -II should be the outcome of the training done/performed during after 7th semester. It should be submitted in hardware form (proto type) or simulation form along with proper data and certificates issued during project training. It should cover the electrical engineering aspects learned during training. A Power point presentation should also be submitted at the time of submission. It can be in the form of major project