FACULTY OF ENGINEERING & TECHNOLOGY

SYLLABUS

FOR

M.Sc. (Internet Studies)
(Semester: I – IV)

SESSION: 2019-20

GURU NANAK DEV UNIVERSITY
AMRITSAR

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       (ii) Subject to change in the syllabi at any time.
            Please visit the University website time to time.
M.Sc. Internet Studies (Semester System)

**Scheme of Course**

**SEMESTER – I:**

<table>
<thead>
<tr>
<th>Paper</th>
<th>Course</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Web Programming</td>
<td>100</td>
</tr>
<tr>
<td>II</td>
<td>Sociology of Internet</td>
<td>100</td>
</tr>
<tr>
<td>III</td>
<td>Search Engine</td>
<td>100</td>
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<tr>
<td>IV</td>
<td>Cyber Crime</td>
<td>100</td>
</tr>
<tr>
<td>V</td>
<td>Practical Based on Web Programming</td>
<td>100</td>
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</tbody>
</table>

**SEMESTER – II:**

<table>
<thead>
<tr>
<th>Paper</th>
<th>Course</th>
<th>Marks</th>
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</thead>
<tbody>
<tr>
<td>I</td>
<td>Server side Web Development using ASP.NET</td>
<td>100</td>
</tr>
<tr>
<td>II</td>
<td>Business on the Internet</td>
<td>100</td>
</tr>
<tr>
<td>III</td>
<td>Web based Multimedia</td>
<td>100</td>
</tr>
<tr>
<td>IV</td>
<td>Online Communities</td>
<td>100</td>
</tr>
<tr>
<td>V</td>
<td>Practical Based on Server side Web Development</td>
<td>100</td>
</tr>
</tbody>
</table>
M.Sc. Internet Studies (Semester System)

**SEMESTER – III:**

<table>
<thead>
<tr>
<th>Paper I</th>
<th>Content Management System</th>
<th>Marks : 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paper II</td>
<td>Digital Rights Management</td>
<td>Marks : 100</td>
</tr>
<tr>
<td>Paper III</td>
<td>Cyber Laws</td>
<td>Marks : 100</td>
</tr>
<tr>
<td>Paper IV</td>
<td>Practical based on Content Management System</td>
<td>Marks : 100</td>
</tr>
<tr>
<td>Paper V</td>
<td>Project (Part – I)</td>
<td>Marks : 200</td>
</tr>
</tbody>
</table>

**SEMESTER – IV:**

<table>
<thead>
<tr>
<th>Paper I</th>
<th>Internet Security</th>
<th>Marks : 100</th>
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</thead>
<tbody>
<tr>
<td>Paper II</td>
<td>Web Services</td>
<td>Marks : 100</td>
</tr>
<tr>
<td>Paper III</td>
<td>Open Sources Software</td>
<td>Marks : 100</td>
</tr>
<tr>
<td>Paper IV</td>
<td>Project (Part – II)</td>
<td>Marks : 300</td>
</tr>
</tbody>
</table>
M.Sc. Internet Studies (Semester-I)

Paper I - Web Programming

Time: 3 Hrs.Marks: 100

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

The student can use only Non-programmable & Non-storage type calculator.

Section–A
The Web: Historical Perspective of HTTP, Uniform Resource Locator, Request-Response paradigm, Statelessness, Request Methods with Status Codes, Structure of HTTP Message: Content Types, caching control, security, session support; Virtual Hosting, Caching Support and Persistent Connections.

Section–B
Client Side Script: Scripting Language variables, functions, conditions, Objects; DOM, Data Validation, Web browser Configuration, Comparison of Client Side Scripting Languages.

Browser Languages:
- XHTML: Forms, Frames, Tables etc.
- DHTML: Cascading Style Sheets, Object Model, Event Model, Filters and Transitions, Data Controls, Handling of Multimedia Data;

Section–C

Section–D
Overview of Server Side Script:
Static vs. Dynamic web pages, Need of Server Side Scripting, Server Side scripting, Multitier Web Architecture

Books Recommended:
Paper II - Sociology of Internet

Instructions for the Paper Setters:-
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Section–A

Social Relationships: Social relationship with or without Internet. Issues of socializing on Internet.

Cultural Impacts: Reshaping culture by Internet, Effect on living habits of people as an individual and in groups, Social implications for families, Schooling, Work, Leisure activities.

Section–B

Language, Ethnicity and Nationalism: Internet as a medium for the expression and distribution of the cultures of local groups and individuals.

Education: Change in teaching and learning methodologies through Internet, Online education, The effectiveness of technology as a tool for learning, The financial implications of the introduction of IT related technologies in class rooms and learning, The changing role of students and teachers in computer mediated learning.

Section–C


Telework: Main Characteristics of Telework, Advantages and Disadvantages, Issues related with Telework, Effect on the organization of work, Importance of the trade unions, political protests etc.

Section–D

E-Governance: Use of Internet by the world governments in the conduct of their functions e.g. services and information etc., Changes in the nature of government and the role of the electorate and citizens, Government’s regulations on Internet and its difficulties.

Enhancing Literacy Skills: Human communications by reading, writing and typing on e-mail, list serves, chats, Usenet etc., its effect on the literacy; Reading and writing skills; Usage of books, Greater use of libraries through online access and digitization of holding archives and database, Impact on the existence of libraries and their budgets.

Books Recommended:
M.Sc. Internet Studies (Semester-I)

Paper III - Search Engine

Time: 3 Hrs. Marks: 100

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

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Section–A
Search Engines: Need of Search Engines, Architecture of Search Engine, Working of Search Engine, Types of Search Engine

Directories: Need of Directories, Implementation, Difference between Search Engines and Directories.

Section–B
Searching Using Keywords: Keywords, Choosing the right keywords, Keywords density, Optimizing keyword density for search engines, Tools and services that help to find the best keywords.

Basic Search Operators: Searching in Plain English, Searching for multiple words and phrases, AND Searches, OR Searches, NOT Searches, NEAR Searches, Parentheses and Nested Searches using Wildcards, Dealing with Stopwords, Stemming

Section–C
Optimizing Websites for Search Engines: Relevance of the Contents, Main Keywords, Initial Promotion of Websites, Link Building, Back Links, Sitemap, Performance Monitoring of website in the search engines, Search Engine Optimization (SEO), Importance of keywords in SEO.

Section–D

Case Study of Search Engines: Google, Altavista, Hotbot, Yahoo, Lycos, Bing, Future of Search Engines.

Books Recommended:
Paper IV - Cyber Crime

Time: 3 Hrs.          Marks: 100

Instructions for the Paper Setters:-
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Section–A

Section–B

Section–C


Section–D

Books Recommended:
3. Atul Jain; Cyber Crime- Issues, Threats and Management; Gyan Publishing.
5. Roderic G. Broad Hurst, Peter.N. Grabesky; Cyber Crime- Challenge in Asia.
M.Sc. Internet Studies (Semester-I)

Paper V - Practical Based on Web Programming

Marks: 100
M.Sc. Internet Studies (Semester-II)

Paper I - Server side Web development using ASP.NET

Time: 3 Hrs.  
Marks: 100

Instructions for the Paper Setters:-
Eight questions of equal marks (specified in the syllabus) are to be set, two in each of the four sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

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Section–A

Scripts: Embedding Script, Configuring Server/Browser for a Script.
Processing Forms: Pass form inputs to a Script, Self-Submission, Query String, Data Validation, Develop a login page.

Section–B

Managing State: Various Means to manage State, Managing Sessions and using Session Variables, Creating a Session and Registering Session Variables, Destroying a Session, Storing Data in Cookies, Setting Cookies, Retrieving Cookie Data, Deleting Cookies, Configuration Issues, Develop a Chat Server.

Section–C

Working With Email: Understanding E-mail -TCP/IP server, Mail Transfer Agent, Mail spool, Mail User Agent, Mail-retrieval program, Mailing list manager; Sending Emails - Attachments, Message Priorities, HTML Formatting and Images, Retrieving Email, Email Auto Responding, Creating a Simple List Server.
Database Operations: Making a Connection, Returning Information from a Database, Changing Information in a database, Executing Stored Procedures, Developing a Discussion Form, A Job Site, Web log, Shopping Cart.

Section–D

Working with XML: Data Binding and Displaying XML Data, Transforming XML, Conversion between XML and Relational Data, Develop a Personal Address Book.
Securing Web Site: Encryption, Authentication and Data Integrity with SSL, Password-Protecting Web Site.

Books Recommended:
M.Sc. Internet Studies (Semester-II)

Paper II - Business on the Internet

Time: 3 Hrs. Marks: 100

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.
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Section–A

Section–B
Business Models of E-Commerce and Infrastructure: E-Commerce Models, Supply Chain Management, Product and Service Digitization, Remote Servicing, Procurement; Online Marketing; Advertising; E-Commerce Resources and Infrastructure; Resources and Planning for Infrastructure.

Section–C
Electronic Payment System: Special features required in payment systems for E-Commerce; Types of E-payment systems; E-cash and currency servers, E-cheques, Credit Cards, Smart Cards, Electronic Purses and Debit Cards; Business Issues and Economic Implications; Operational Credit and Legal Risks of E-payment Systems; Risk Management options in E-payment Systems; Components of an effective Electronic Payment System.

Section–D
Case Studies: E-Commerce in various business areas like Banks, Reservations, E-Governance, Supply- Chain Management, Manufacturing, Retailing and On-Line Publishing.

Books Recommended:
M.Sc. Internet Studies (Semester-II)

Paper III – Web Based Multimedia

Time: 3 Hrs.  Marks: 100

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.
The student can use only Non-programmable & Non-storage type calculator.

Section–A
Multimedia and the Web: Web based Multimedia basics, Objects of Multimedia (Text, Images, Animation, Audio, Video), Web based Multimedia Applications

Accessing Multimedia using Web Browsers: File Formats and various supportive file extensions, Role of Web Browsers to run web based multimedia programs, Common plug-in’s for web browsers

Section–B
Multimedia Streaming: Multimedia Streaming Concepts, Components, Common Streaming Media Codecs

Audio & Video Asset Production: Basic Principles of managing audio and video, Dealing with sounds (Mono, Stereo and Surround) and various related techniques for Digitization, Digital basics for audio asset production – Aliasing, MIDI and Editing, Digitizing video for multimedia.

Section–C

Section–D

Books Recommended:
Paper IV - Online Communities

Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.
The student can use only Non-programmable & Non-storage type calculator.

Section–A
Introduction: Origin and need of online communities, Features and commercial benefits of online communities, online community vs Lists, Discussion Groups or Forums, Advantages and Disadvantages of online communities.

Section–B

Section–C
Developing an online community: Community strategy, Planning online community, Infrastructural Layout, Hardware / Software resources, User interface design, Safety measures for bandwidth theft, Freedom of speech, Multiple accounts, User accounts management.

Section–D
Promoting and Monetizing Community: Collaborations with search Engines, Directories, Link Exchange, Contest and give aways, Post Exchange, Paid Memberships, Advertising, e-commerce and donations.
Overview of Blogs and Social networking.

Books Recommended:
1. Patria O. Keefe – Managing Online Forums: Everything you need to know to create and run Successful Community Discussion Boards, AMACOM, A Division of American Management Association, 2008.
Paper V: Practical based on Server Side Web Development using ASP

Marks: 100
Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.
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Section A
What is Content Management: What is Content-Defining Data, Information and Content, Format and Structure, Understanding Content Management, Introducing the Major Parts of a CMS, Need for an Effective CMS, Qualities of Good CMS, Component Management versus Composition Management, Roots of Content Management, Branches of Content Management.

Section B

Section C
Designing a CMS: Wheel of Content Management, Working with Metadata, Cataloging Audiences, Designing Publications and Content Types, Accounting for Authors, Accounting for Acquisition Sources, Designing : Content Access Structures, Templates, Personalization, Workflow and Staffing Models.

Section D

Buying a CMS: Reasons, Purchase Process, Questions to be asked.

Study of various CMS Tools: Joomla, Drupal.

Books Recommended:
Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

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Section A

Section B
DRM Technologies: Technologies to Protect Content like Film, Music,(Audio CD’s & Internet Music) Computer Games, E-books and Documents; Direct Protection of the Content, Digital Watermark, Digital Fingerprint, Encryption, Identifications, Biometrics in DRM.

Section C

Section D

Books Recommended:
Instructions for the Paper Setters:-
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section. 
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Section A


Section B
Jurisdiction in the Cyber World: Civil Law of Jurisdiction in India, Jurisdiction and Information Technology Act, Legal Principles on Jurisdiction in U.S.A, Jurisdiction Disputes w.r.t. the Internet in U.S.A.

Copyright Protection in the Cyber World: Meaning of Copyright, Copyright Ownership, License of Copyright, Copyright Protection of Content on the Internet, Downloading for Viewing Content on the Internet, Hyper Linking and Framing, Computer Software Piracy.

Section C

Section D


**Books Recommended:**
2. Pavan Duggal, Cyber Law: The Indian Perspective, Saakshar Law Publications, Delhi
M.Sc. Internet Studies (Semester-III)

Paper IV - Practical based on Content Management System

Marks: 100
1. Candidates have to submit only one hard copy and CD of documentation which shall be kept with the course supervisor/guide in the college only. Further, supervisor/guide OR principal of college shall forward two copies of DVD (Digital Versatile Disk) containing all the documentation files of the students (file name to be saved as Rollno_of_the_student.pdf) to the concerned branch of the University. Covering letter (duly signed by the principal/Head of the college/institute) should contain the following information. 

Candidate name, Candidate Roll no, Project Title of the student and .pdf file name of his project documentation.

2. The assignment shall be evaluated by a board of three examiner (two (02) External examiners and one (01) internal examiner) as approved by the BOS.

3. The Project is to be submitted as per the common ordinances for P.G. courses under semester system.
M.Sc. Internet Studies (Semester – IV)

Paper I - Internet Security

Time: 3 Hrs.  
Marks: 100

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.
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Section A


Classes of Attack: Stealing Passwords, Social Engineering, Bugs and Backdoors, Authentication Failures, Protocol Failures, Information Leakage, Exponential Attacks, Viruses and Worms, Denial-of-Service Attacks, Botnets and Active Attacks

Section B

The Hacker’s Workbench and other Munitions: Introduction, Hacking Goals, Scanning a network, Breaking into the host, and Battle for the host, Covering tracks, Metastasis, Hacking tools

Safer Tools and Services: Authentication, Time based one time passwords, Challenge one time passwords, Lamport’s one time password algorithm, Smart cards, Biometrics, RADIUS, SASL, Host to Host Authentication

Section C

Firewalls and Proxy Servers: Kinds of Firewalls, Packet Filters, Application-Level Filtering, Circuit-Level Gateways, Dynamic Packet Filters, Distributed Firewalls, What Firewalls Cannot Do, Filtering Services, Reasonable Services to Filter, Digging for Worms, Packet Filtering, Implementing policies (Default allow, Default Deny) on proxy.

Section D

Cryptographic Techniques: Cryptographic Hash functions, Secret Key Cryptography, Public Key Cryptographic, Digital Envelopes, Protection of Cryptographic keys, Generation of Pseudo random Bit sequence

Books Recommended:

2. John R. Vacca; Practical Internet Security; Springer; 2007
4. Larry J. Huges; Actually useful Internet Security Techniques; Jr New Riders Publishing; 2002
5. Rolf Oppliger; Internet and Intranet Security; Artech House; 2002
M.Sc. Internet Studies (Semester – IV)

Paper II - Web Services

Time: 3 Hrs.  MARKS: 100

Instructions for the Paper Setters:
Eight questions of equal marks (Specified in the syllabus) are to be set, two in each of the four Sections (A-D). Questions may be subdivided into parts (not exceeding four). Candidates are required to attempt five questions, selecting at least one question from each Section. The fifth question may be attempted from any Section.

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Section A
Evolution and Emergence of Web Services: Evolution of distributed computing, Core Distributed Computing Technologies – client/server, CORBA, JAVA RMI, Micro Soft 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 Site vs Web Services.

Section B
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, basic steps of implementing web services, Developing Web Services enabled applications.

Core Fundamentals of SOAP: SOAP Message Structure, SOAP encoding, SOAP message exchange models, SOAP communication and messaging, SOAP security

Section C
Developing Web Services using SOAP: Building SOAP Web Services, Developing SOAP Web Services using Java, limitations of SOAP.


Section D
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, Support for Categorization in UDDI Registries, Publishing API, Publishing Information to a UDDI Registry, Searching Information in a UDDI Registry, Deleting Information in a UDDI Registry, Limitations of UDDI.

Web Services Interoperability: Means of Ensuring Interoperability, Overview of .NET and J2EE.


Books Recommended:
3. XML, Web Services, and the Data Revolution, F.P.Coyle, Pearson Education.
Paper III - Open Sources Software

Time: 3 Hrs.  
Marks: 100

Instructions for the Paper Setters:-
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Section A

Section B
Open Source Software: Early History, Categories of Open Source Software, Specific Characteristics of OSS

Organization and Management of OSS: OSS development Process, Taboos and norms in OSS development, The OSS development life cycle

Development of OSS: Methodology and languages used to develop open source products, Cross Platform code


Section D
Extending open source principles beyond software development: Network enabled Collaboration, Building Internet operating system, the rise of Modern Bio Technology and open source biology.
Case studies of open sources like Mozilla, PHP, Apache, Joomla, Drupal, Fedora, WiKipedia etc.

Books Recommended:
Students will continue the same Project as already selected in Semester III.

1. Candidates have to submit only one hard copy and CD of documentation which shall be kept with the course supervisor/guide in the college only. Further, supervisor/guide OR principal of college shall forward two copies of DVD (Digital Versatile Disk) containing all the documentation files of the students (file name to be saved as Rollno_of_the_student .pdf) to the concerned branch of the University. Covering letter (duly signed by the principal/Head of the college/institute) should contain the following information. 
   
    Candidate name, Candidate Roll no, Project Title of the student and .pdf file name of his project documentation.

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