

14	SQL queries for aggregate functions - min, max, count, average, sum, nested sub-queries, Join operations - inner, left join, right join, natural join, Cartesian product.
15	Overview of Forms and Reports.

Assessment Methods

Written tests, assignments, quizzes, presentations as announced by the instructor in the class.

Keywords

Databases, E-R diagrams, normalization, structured query language

Computer Networks (CSGE301) Generic Elective - (GE)

Credit: 06

Course Objective

This course covers the fundamental concepts of computer networks, standard models of computer networks having layered architecture, data communication, network topologies, web technologies and internet applications.

Course Learning Outcomes

On successful completion of this course, a student will be able to:

1. State the use of computer networks and different network topologies.
2. Distinguish between LAN, MAN, WAN, and between Intranet, Extranet and Internet.
3. Compare OSI and TCP/IP architectures
4. Enumerate different transmission media and describe the use of each of them.
5. Design web pages using HTML.

Detailed Syllabus

Unit 1

Computer Networks: Introduction to computer network, data communication, components of data communication, data transmission mode, data communication measurement, LAN, MAN, WAN, wireless LAN, internet, intranet, extranet.

Unit II

Network Models: Client/ server network and Peer-to-peer network, OSI, TCP/IP, layers and functionalities.

Unit III

Transmission Media: Introduction, Guided Media: Twisted pair, Coaxial cable, Optical fiber. Unguided media: Microwave, Radio frequency propagation, Satellite.

Unit IV

LAN Topologies: Ring, bus, star, mesh and tree topologies. Network Devices: NIC, repeaters, hub, bridge, switch, gateway and router.

Unit V

Internet Terms: Web page, Home page, website, internet browsers, URL, Hypertext, ISP, Web server, download and upload, online and offline. Internet Applications: www, telnet, ftp, e-mail, social networks, search engines, Video Conferencing, e-Commerce, m-Commerce, VOIP, blogs.

Unit VI

Introduction to Web Design: Introduction to hypertext mark-up language (html), Document type definition, creating web pages, lists, hyperlinks, tables, web forms, inserting images, frames, hosting options and domain name registration. Customized Features: Cascading style sheet (CSS) for text formatting and other manipulations.

Practical

Networking exercises in a trial lab, where effects of different connectors, topologies in practical could be demonstrated.

Before moving to JavaScript practicals, students must get an idea about fundamental programming using Scratch (<https://scratch.mit.edu>). Students should be encouraged to learn Scratch on their own and work on assignments available online such as <https://sites.google.com/site/christopherscfahs/scratch-programming/scratch-assignments> or <http://scratched.gse.harvard.edu/resources/uw-catapult-project>.

Alternatively, students may use Alice (<http://www.alice.org/index.php>) and learn basic programming. A lot of online assignments and spoken tutorials on YouTube would be helpful.

Practical exercises based on concepts listed in theory using HTML.

1. Create HTML document with following formatting – Bold, Italics, Underline, Colors, Headings, Title, Font and Font Width, Background, Paragraph, Line Brakes, Horizontal Line, Blinking text as well as marquee text.
2. Create HTML document with Ordered and Unordered lists, Inserting Images, Internal and External linking
3. Create HTML document with Table:

			Some image here	

4. Create Form with Input Type, Select and Text Area in HTML.
5. Create an HTML containing Roll No., student's name and Grades in a tabular form.
6. Create an HTML document (having two frames) which will appear as follows:

About Department 1 Department 2 Department 3	This frame would show the contents according to the link clicked by the user on the left frame.
---	---

7. Create an HTML document containing horizontal frames as follows:

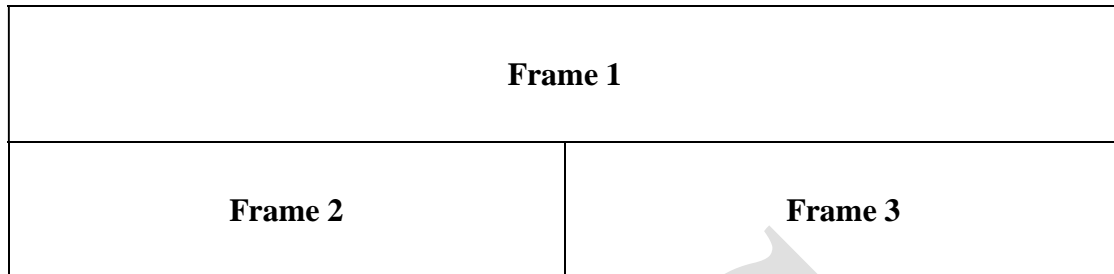
Department Names (could be along with Logos)
Contents according to the Link clicked

8. Create a website of 6 – 7 pages with different effects as mentioned in above problems.

9. Create HTML documents (having multiple frames) in the following three formats:

Department Names (could be along with Logos)
--

Contents according to the Link clicked



10. Create a form using HTML which has the following types of controls:

- I. Text Box
- II. Option/radio buttons
- III. Check boxes
- IV. Reset and Submit buttons

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References

1. Forouzan, B.A. (2017). *Data Communication and Networking*, McGraw-Hill Education.
2. Powell, T.A. (2010). *HTML & CSS: The Complete Reference*. 5th edition. Tata McGraw-Hill.

Additional Resources

1. Minnick, J. (2015). *Web Design with HTML5 and CSS3*. 8th edition. Cengage Learning.

2. Stallings, W. (2017), *Data and Computer Communications*. 10th edition. Pearson Education India.
3. Tanenbaum, A.S. & Wethrall, D. J.(2012).*Computer Networks*, Pearson Education.

Course Teaching Learning Process

- Use of ICT tools in conjunction with traditional class-room teaching methods
- Interactive sessions
- Class discussions

Tentative weekly teaching plan is as follows:

Week	Topics
1-2	Introduction to computer network, data communication, components of data communication, Data transmission mode, data communication measurement, LAN, MAN, WAN, wireless LAN, internet, intranet, extranet
3	Network Models: Client/ server network and Peer-to-peer network
4-5	OSI Model, TCP/IP, layers and functionalities.
6-7	Transmission Media: Guided Media: Twisted pair, Coaxial cable, Optical fiber, Unguided media: Microwave, Radio frequency propagation, Satellite
8	LAN Topologies: Ring, bus, star, mesh and tree topologies.
9	Network Devices: NIC, repeaters, hub, bridge, switch, gateway and router.
10	Internet Terms: Web page, Home page, website, internet browsers, URL, Hypertext, ISP, Web server, download and upload, online and offline
11	Introduction to Web Design: Introduction to hypertext markup language (html) Document type definition, creating web pages, lists,
12	Hyperlinks, tables, web forms
13	Inserting images, Frames, hosting options and domain name registration
14	Customized Features: Cascading style sheet (css) for text formatting and other manipulations.

Assessment Methods

Written tests, assignments, quizzes, presentations as announced by the instructor in the class.

Keywords

network topologies, data communication, OSI model, TCP/IP model, HTML, web design.

Information Security and Cyber Laws (CSGE401) Generic Elective - (GE)**Credit: 06**

Course Objectives

This course introduces the students to the concepts of information security and different type of attacks in the cyber space. The course also introduces countermeasures to mitigate attacks and different existing cyber laws.

Course Learning Outcomes

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

1. Learn, structure, mechanics and evolution of various crime threats
2. Learn to protect information systems from external attacks by developing skills in enterprise security, wireless security and computer forensics.
3. Analyse the risks involved while sharing their information in cyber space and numerous related solutions like sending protected and digitally signed documents
4. Insights of ethical hacking and usage of password cracking tools
5. Get an overview of different ciphers used for encryption and decryption.

Detailed Syllabus**Unit 1**

Definitions :Protection, Security, risk, threat, vulnerability, exploit, attack, confidentiality, integrity, availability, non-repudiation, authentication , authorization, codes, plain text, encryption, decryption, cipher text, key, ciphers, Symmetric and asymmetric



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