Course Plan

A. Course Handout updated on 18th July, 2022

Institute/School/College Name	Chitkara University Institute of Engineering and Technology		
Department Name	Department of Computer Science & Engineering		
Programme Name	Bachelor of Engineering (B.E.) - Computer Science & Engineering		
Course Name	System Design	Session	2022-2023
Course Code	CS254H	Semester/Batch	5th/CSE 2020
L-T-P (Per Week)	2-0-0	Course Credits	02
Course Coordinator Name	Er. Chaitanya Singla		

1. Scope and Objectives of the Course

The course provides a wide scope of learning & understanding of the subject. The main objectives of the course are to:

- Gives students hands-on experience with a project-based approach to systems analysis and design.
- Incorporates object-oriented concepts into traditional techniques.
- Progresses logically through each topic, presenting new material in a way that mirrors a professional analyst's workflow.
- Allows students to apply their own work to real-world examples, including running cases that serve as project templates for a hands-on learning experience.
- Highlights the considerations surrounding SAD concept application with stories of real companies' successes and failures.

2. Course Learning Outcomes

After completion of the course, students will be able to do the following:

CLO01: Distinguish concepts related to processes, threads, process scheduling, race conditions and critical sections.
CLO02: Examine and categorize various memory management techniques like caching, paging, segmentation, virtual memory, and thrashing; Design and implement file management system.
CLO03: Construct the SQL queries for given specifications.
CLO04: Explain the functions of the different layer of the OSI Protocol.

CLO-PO mapping grid

Course Learning Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CLO1	H	H	H	H					H	M	H	
CLO2	H	H	H	H					H	M	H	
CLO3	H	H	H	H					H	M	H	
CLO4	H	H	H	H					M	M	H	

3. Recommended Books (Reference Books/Text Books)

B01: System Analysis and Design, 7th edition, Julie E Kendall and Kenneth E Kendal, 2009.
B02: Systems Analysis and Design, 9th edition, Gary Shelly, Harry J. Rosenblatt, 2011.
B03: System Analysis And Design, 5th edition, Wixom & Roth, 2012.
B04: Database System Concepts", 6th Edition by Abraham Silberschatz, Henry F. Korth, S. Sudarshan, McGraw-Hill, 2010.
B05: Data Communication and Networking, 4th Edition, Behrouz A. Forouzan, McGraw-Hill, 2007.

B06: Operating System Concepts Essentials, 9th Edition by Avi Silberschatz, Peter Galvin, Greg Gagne, Wiley Asia Student Edition, 2013.

4. Other readings and relevant websites:

Serial No	Link of Journals, Magazines, Websites and Research Papers
1.	http://www.svecw.edu.in/Docs%5CCSECNLNotes2013.pdf
2.	https://nptel.ac.in/courses/106105175
3.	https://nptel.ac.in/courses/106106095
4.	https://nptel.ac.in/courses/106108101
5.	https://www.ece.uvic.ca/~itraore/elec567-13/notes/dist-03-4.pdf

5. Recommended Tools and Platforms

Coding Ninjas (online platform- https://codingninjas.com/)

6. Course Plan:

Lecture Number	Topics	Recommended Books
1-2	Process Management, Process Control Blocks, Process States	B01, B06
3-4	Process Control Block (PCB), Process Scheduling Queues	B01, B06
5-6	Schedulers, Threading, Memory management (types, fragmentation, paging, segmentation)	B06
7-10	Scheduling Algorithms pre-emptive and non-pre-emptive	B06
11-12	Virtual memory, Demand Paging, page replacement algorithms	B06
13-14	Swapping, Thrashing	B02, B06
15-16	File System(Types of file system, File system structure)	B04
ST-1 (Lecture 1- Lecture 16)		
17-18	Allocation methods, directory implementation file system vs DBMS	B04
19-20	HLD (Decision Tables, Decision Trees, Flow Diagrams, Flow Charts, Data Dictionary), LLD	B04
21-22	Case Studies, Scaling(Vertical and Horizontal Scaling) OSI Layers(physical layer)	B05
23	Data link layer, network layer	B05
24	Transport layer, session layer, presentation layer, application layer	B05
25	IP addressing	B05
26	Types of IP address, Classes	B05
27-28	SQL Commands, NoSQL(graph, Document, Column family) Practice Queries	B03,B04
29-30	Normalisation, Indexing Tabular vs Columnar Data	B04
ST-2 (Lecture 17- Lecture 30)		

7. Delivery/Instructional Resources

Lecture Number	Topics	PPT *(Link of ppts on the central server)*	Industry Expert Session *(If **yes**: link of ppts on the central server)*	Web References	Audio-Video
1-2	Process Management, Process Control Blocks, Process States	https://drive.google.com/drive/folders/1ymEpgEmMUhRY7JLSKGclPWNXbUKDzS3u?usp=sharing		https://ncet.co.in/assets/pdf/e_learning/cse/ol/semV/Operating System/ppt/Process%20Management.ppt.pdf	https://youtu.be/Z4-wt7FBLRM
3-4	Process Control Block (PCB), Process Scheduling Queues	https://drive.google.com/drive/folders/1ymEpgEmMUhRY7JLSKGclPWNXbUKDzS3u?usp=sharing		https://www.knowledgeplus.mu/support/computer/Operating%20System%20-%20Scheduling%20HSC%20Notes.pdf	https://youtu.be/omHWliBI8NE
5-6	Schedulers, Threading, Memory management (types, fragmentation, paging, segmentation)	https://drive.google.com/drive/folders/1ymEpgEmMUhRY7JLSKGclPWNXbUKDzS3u?usp=sharing		https://web.cs.wpi.edu/~cs3013/c07/lectures/Section08-Memory_Management.pdf	https://youtu.be/dz9Tk6KCMlQ
7-10	Scheduling Algorithms pre-emptive and non-pre-emptive	https://drive.google.com/drive/folders/1ymEpgEmMUhRY7JLSKGclPWNXbUKDzS3u?usp=sharing		https://web.cs.wpi.edu/~cs3013/c07/lectures/Section05-Scheduling.pdf	https://youtu.be/zFnrUVqtiOY
11-12	Virtual memory, Demand Paging, page	https://drive.google.com/drive/folders/1ymE		https://www.cs.ccu.edu.tw/~korenson/courses/cs3000/ch09.pdf	https://youtu.be/o2_iCzS9-ZQ

	replacement algorithms	pgEmMUhRY7JLSKGclPWNXbUKDzS3u?usp=sharing			
13-14	Swapping, Thrashing	https://drive.google.com/drive/folders/1ymEpgEmMUhRY7JLSKGclPWNXbUKDzS3u?usp=sharing		https://web.cs.wpi.edu/~claypool/courses/3013-A99/slides/vmem.pdf	https://www.youtube.com/watch?v=6c-mOFZwP_8
15-16	File System(Types of file system, File system structure)	https://drive.google.com/drive/folders/1ymEpgEmMUhRY7JLSKGclPWNXbUKDzS3u?usp=sharing		https://www.geeksforgeeks.org/difference-between-file-system-and-dbms/	https://www.youtube.com/watch?v=ZtVw2iuFI2w
17-18	Allocation methods, directory implementation file system vs DBMS	https://drive.google.com/drive/folders/1ymEpgEmMUhRY7JLSKGclPWNXbUKDzS3u?usp=sharing		https://www.geeksforgeeks.org/difference-between-file-system-and-dbms/	https://www.youtube.com/watch?v=ZtVw2iuFI2w
19-20	HLD (Decision Tables, Decision Trees, Flow Diagrams, Flow Charts, Data Dictionary), LLD	https://drive.google.com/drive/folders/1ymEpgEmMUhRY7JLSKGclPWNXbUKDzS3u?usp=sharing		https://www.includehelp.com/dbms/data-dictionary-in-dbms.aspx	https://www.youtube.com/watch?v=YflikN1VJ50 https://www.youtube.com/watch?v=x5hE1sc5nfQ
21-22	Case Studies, Scaling(Vertical and Horizontal Scaling) OSI Layers(physical layer)	https://drive.google.com/drive/folders/1ymEpgEmMUhRY7JLSKGclPWNXbUKDzS3u?usp=sharing		https://www.geeksforgeeks.org/layers-of-osi-model/	https://www.youtube.com/watch?v=1msEo8PIcbw
23	Data link layer, network layer	https://drive.google.com/drive/folders/1ymEpgEmMUh		https://www.geeksforgeeks.org/layers-of-osi-model/	https://www.youtube.com/watch?v=1msEo8PIcbw

		RY7JLSKGcIPWNXbUKDzS3u?usp=sharing			
24	Transport layer, session layer, presentation layer, application layer	https://drive.google.com/drive/folders/1ymEpgEmMUhRY7JLSKGcIPWNXbUKDzS3u?usp=sharing		https://www.geeksforgeeks.org/layers-of-osi-model/	https://www.youtube.com/watch?v=1msEo8PIcbw
25	IP addressing	https://drive.google.com/drive/folders/1ymEpgEmMUhRY7JLSKGcIPWNXbUKDzS3u?usp=sharing		https://www.javatpoint.com/ip-address	https://www.youtube.com/watch?v=_ISu9f8ofZk
26	Types of IP address, Classes	https://drive.google.com/drive/folders/1ymEpgEmMUhRY7JLSKGcIPWNXbUKDzS3u?usp=sharing		https://docs.oracle.com/cd/E19504-01/802-5753/planning3-78185/index.html	https://www.youtube.com/watch?v=_ISu9f8ofZk
27-28	SQL Commands, NoSQL(graph, Document, Column family) Practice Queries	https://drive.google.com/drive/folders/1ymEpgEmMUhRY7JLSKGcIPWNXbUKDzS3u?usp=sharing		https://www.mongodb.com/nosql-explained	https://www.youtube.com/watch?v=xQnIN9bW0og
29-30	Normalisation, Indexing Tabular vs Columnar Data	https://drive.google.com/drive/folders/1ymEpgEmMUhRY7JLSKGcIPWNXbUKDzS3u?usp=sharing		https://www.guru99.com/database-normalization.html	https://www.youtube.com/watch?v=EGEwkad_llA

8. Action plan for different types of learners:

Slow Learners	Average Learners	Advanced Learners
• Slow learners will be moved to some easy problems so that they master the concepts. Remedial classes have planned.	• Some extra sessions can be planned for them to improve their performance.	• These learners will be given additional projects so that they will get sufficient practical hands on experience.

9. Evaluation Scheme & Components:

Evaluation Component	Type of Component	No. of Assessments	Weightage of Component
Component 2	Subjective Test/Sessional Tests (STs)	02*	40%
Component 3	End Term Examinations	01	60%
Total		100%	

* Out of 02STs, the ERP system will automatically pick marks of the best 01 ST for final marks evaluation of STs.

10. Details of Evaluation Components:

Evaluation Component	Description	Syllabus Covered (%)	Timeline of Examination	Weightage (%)
Component 02	ST 01	Up to 40%	2nd Week	40%
	ST 02	41% - 80%	3rd Week	
Component 03	End Term Examination**	100%	4th Week	60%
Total				100%

**As per Academic Guidelines minimum of 75% attendance is required to become eligible for appearing in the End Semester Examination

11. Syllabus of the Course:

Lecture Number	Topics	No. of Lectures	Weightage %
1-2	Process Management, Process Control Blocks, Process States	4	15%
3-4	Process Control Block (PCB), Process Scheduling Queues	4	
5-6	Schedulers, Threading, Memory management (types, fragmentation, paging, segmentation)	4	35%
7-10	Scheduling Algorithms pre-emptive and non-pre-emptive	8	
11-12	Virtual memory, Demand Paging, page replacement algorithms	4	
13-14	Swapping, Thrashing	2	
15-16	File System(Types of file system, File system structure)	4	
17-18	Allocation methods, directory implementation file system vs DBMS	4	
19-20	HLD (Decision Tables, Decision Trees, Flow Diagrams, Flow Charts, Data Dictionary), LLD	4	20%

21-22	Case Studies, Scaling(Vertical and Horizontal Scaling) OSI Layers(physical layer)	2	
23	Data link layer, network layer	3	
24	Transport layer, session layer, presentation layer, application layer	3	
25	IP addressing	2	30%
26	Types of IP address, Classes	4	
27-28	SQL Commands, NoSQL(graph, Document, Column family) Practice Queries	4	
29-30	Normalisation, Indexing Tabular vs Columnar Data	4	

This Document is approved by:

Designation	**Name**	**Signature**
Course Coordinator	Er. Chaitanya Singla	
Head Academic Delivery	Dr. Ambuj Agarwal	
Dean	Dr. Rupali Gill	
Dean (Academic Affairs)	Dr. Rajnish Sharma	
Date		