Indira Gandhi University, Meerpur Rewari

Syllabus for B.Tech. – IIIrd Year
(Semester V and VI)
(Computer Science & Engineering)

Session –w.e.f. 2018-2019

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI
Scheme of studies & Examination
Bachelor of Technology (Computer Science & Engineering)
Semester - V

S. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)
			L	T	P	Total	Marks of Class work	Theory	Practical	Total	
1	CSE-301	Principles of Operating System (CSE,IT)	3	1	-	4	50	100	-	150	3
2	EE-309	Microprocessors and Interfacing (EL,CSE,IT,EI, IC, EEE, AEI)	3	1	-	4	50	100	-	150	3
3	CSE-303	Computer Graphics (CSE,IT)	3	1	-	4	50	100	-	150	3
4	CSE-305	Theory of Automata Computation	3	1		4	50	100	-	150	3
5	CSE 307	Web Development (Common with IT – VI Sem)	3	1	-	4	50	100	-	150	3
6	IT-204	Multimedia Technologies (Common with IT- IV-Sem)	3	-	-	3	50	100	-	150	3
7	CSE-309	Computer Graphics Lab. (CSE,IT)	-	-	3	3	25	-	25	50	3
8	CSE-311	Web Development & Core JAVA Lab. th (Common with 6 Sem.-IT)	-	-	2	2	25	-	25	50	3
9	IT-208	Multimedia Tech. Lab (Common with IT–IVSem)	-	-	2	2	25	-	25	50	3
10	EE-329	Microprocessors and Interfacing Lab. (EL,CSE,IT,EI, IC, EEE, AEI)	-	-	2	2	25	-	25	50	3
11.	CSE-313	O.S. Lab. (CSE, IT)	-	-	2	2	25	-	25	50	-
12	CSE-315	Practical Training-I	-	-	2	2	-	-	-	-	-
		TOTAL	**18**	**5**	**13**	**36**	**425**	**600**	**125**	**1150**	

Note:

1. Students will be allowed to use non-programmable scientific calculator. However, sharing of calculator will not be permitted in the examination.

2. Assessment of Practical Training-I, undergone at the end of IV semester, will be based on seminar, viva-voce, report and certificate of practical training obtained by the student from the industry. According to performance letter grades A, B, C, F are to be awarded. A student who is awarded "F" grade is required to repeat Practical Training.

CSE-301   **Principles   of   Operating   Systems**

L	**T**	**P**	**Class Work**	:	50 Marks
3	1	–	**Exam**	:	100 Marks
			Total	:	150 Marks

Duration   of Exam :   3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Introduction: Introduction to Operating System Concepts (including Multitasking, multiprogramming, multi user, Multithreading etc)., Types of Operating Systems: Batch operating system, Time-sharing systems, Distributed OS, Network OS, Real Time OS; Various Operating system services, architecture, System programs and calls.

Process Management: Process concept, process scheduling, operation on processes; CPU scheduling, scheduling criteria, scheduling algorithms irst Come First Serve (FCFS), Shortest-Jobirst (SJF), Priority Scheduling, Round Robin(RR), Multilevel Queue Scheduling.

Section-B

Memory Management: Logical & Physical Address Space, swapping, contiguous memory allocation, non-contiguous memory allocation paging and segmentation techniques, segmentation with paging; virtual memory management - Demand Paging & Page-Replacement Algorithms; Demand Segmentation.

Section-C

File System: Different types of files and their access methods, directory structures, various allocation methods, disk scheduling and management and its associated algorithms, Introduction to distributed file system.

Process-Synchronization & Deadlocks: Critical Section Problems, semaphores; methods for handling deadlocks-deadlock prevention, avoidance & detection; deadlock recovery.

Section D

I/O Systems: I/O Hardware, Application I/O Interface, Kernel, Transforming I/O requests, Performance Issues and Thresds
Unix System And Windows NT Overview

Unix system call for processes and file system management, Shell interpreter, Windows NT architecture overview, Windows NT file system.

Text Books:
- Operating System Concepts by Silberchatz et al, 5 [th] edition, 1998, Addison-Wesley.
- Modern Operating Systems by A. Tanenbaum, 1992, Prentice-Hall.

Operating Systems Internals and Design Principles by William Stallings,4 [th] edition, 2001, Prentice-Hall

Reference Books:
1. Operating System By Peterson , 1985, AW.
2. Operating System By Milankovic, 1990, TMH.
3. Operating System Incorporating With Unix & Windows By Colin Ritche, 1974, TMH.
4. Operating Systems by Mandrik & Donovan, TMH
5. Operating Systems By Deitel, 1990, AWL.
6. Operating Systems – Advanced Concepts By Mukesh Singhal , N.G. Shivaratri, 2003, T.M.H

EE-309   Microprocessors and Interfacing

L   T   P
                        Theory   : 100 Marks
3   1   -
                                     Class work   : 50 Marks

                        Total   : 150 Marks

                        Duration of Exam : 3 Hours

NOTE: For setting up the question paper, Question No. 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section A

THE 8085 PROCESSOR :
Introduction to microprocessor, 8085 microprocessor : Architecture, instruction set, interrupt structure, and Assembly language programming.

Section B

THE 8086 MICROPROCESSOR ARCHITECTURE :
Architecture, block diagram of 8086, details of sub-blocks such as EU, BIU; memory segmentation and physical address computations, program relocation, addressing modes, instruction formats, pin diagram and description of various signals

Section C

INSTRUCTION SET OF 8086 :
Instruction execution timing, assembler instruction format, data transfer instructions, arithmetic instructions, branch instructions, looping instructions, NOP and HLT instructions, flag manipulation instructions, logical instructions, shift and rotate instructions, directives and operators, programming examples.

Section D

INTERFACING DEVICE :
  8255 Programmable peripheral interface, interfacing keyboard and seven segment display, 8254
  (8253) programmable interval timer, 8259A programmable interrupt controller, Direct Memory
  Access and 8237 DMA controller.

TEXT BOOKS :

1. Microprocessor Architecture, Programming & Applications with 8085 : Ramesh S Gaonkar; Wiley Eastern Ltd.
2. The Intel Microprocessors 8086- Pentium processor : Brey; PHI

REFERENCE BOOKS:
1. Microprocessors and interfacing : Hall; TMH
2. The 8088 & 8086 Microprocessors-Programming, interfacing,Hardware & Applications :Triebel & Singh; PHI
3. Microcomputer systems: the 8086/8088 Family: architecture, Programming & Design : Yu-Chang Liu & Glenn A Gibson; PHI.
4. Advanced Microprocessors and Interfacing : Badri Ram; TMH

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CSE  -303              Computer   Graphics
L  T  P                        Class   Work      :  50 Marks
3  1  -                        Exam             :  100 Marks
                               Total            :  150 Marks

                               Duration  of  Exam :   3 Hrs.
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NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Introduction to Computer Graphics: What is Computer Graphics, Computer Graphics Applications, Computer Graphics

Hardware and software, Two dimensional Graphics Primitives: Points and Lines, Line drawing algorithms: DDA, Bresenham"s; Circle drawing algorithms: Using polar coordinates, Bresenham"s circle drawing, mid point circle drawing algorithm; Filled area algorithms: Scanline: Polygon filling algorithm, boundary filled algorithm.

Section-B

Two/Three Dimensional Viewing: The 2-D viewing pipeline, windows, viewports, window to view port mapping; Clipping: point, clipping line (algorithms):- 4 bit code algorithm, Sutherland-cohen algorithm, parametric line clipping algorithm (Cyrus Beck).

Polygon clipping algorithm: Sutherland-Hodgeman polygon clipping algorithm. Two dimensional transformations: transformations, translation, scaling, rotation, reflection, composite transformation.

Section-C

Three-dimensional transformations: Three dimensional graphics concept, Matrix representation of 3-D Transformations, Composition of 3-D transformation.

Viewing in 3D: Projections, types of projections, the mathematics of planner geometric projections, coordinate systems.

Hidden surface removal: Introduction to hidden surface removal. The Z- buffer algorithm, scanline algorithm, area sub-division algorithm.

Section-D

Representing Curves and Surfaces: Parametric representation of curves: Bezier curves, B-Spline curves. Parametric representation of surfaces; Interpolation method.

Illumination, shading, image manipulation: Illumination models, shading models for polygons, shadows, transparency. What is an image? Filtering, image processing, geometric transformation of images.

Text Books:
1. Computer Graphics Principles and Practices second edition by James D. Foley, Andeies van Dam, Stevan K. Feiner and Johb F. Hughes, 2000, Addision Wesley.
2. Computer Graphics by Donald Hearn and M.Pauline Baker, 2 Edition, 1999, PHI

Reference Books:
1. Procedural Elements for Computer Graphics – David F. Rogers, 2001, T.M.H Second Edition
2. Fundamentals of 3Dimensional Computer Graphics by Alan Watt, 1999, Addision Wesley.
3. Computer Graphics: Secrets and Solutions by Corrign John, BPB
4. Graphics, GUI, Games & Multimedia Projects in C by Pilania & Mahendra, Standard Publ.
5. Computer Graphics Secrets and solutions by Corrign John, 1994, BPV
6. Introduction to Computer Graphics By N. Krishanmurthy T.M.H 2002

CSE-305   **Theory of Automata Computation**

L	T	P				
3	1	–	**Class Work**	:	50 Marks	
			Exam	:	100 Marks	
			Total	:	150 Marks	

Duration of Exam : 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Finite Automata and Regular Expressions: Finite State Systems, Basic Definitions Non-Deterministic finite automata

(NDFA), Deterministic finite automata (DFA), Equivalence of DFA and NDFA Conversion of NFA to DFA Finite automata with E-moves, Regular Expressions, Equivalence of finite automata and Regular Expressions, Regular expression conversion and vice versa.

Introduction to Machines: Concept of basic Machine, Properties and limitations of FSM. Moore and mealy Machines, Equivalence of Moore and Mealy machines, state and prove Arden"s Method.

Section-B

Properties of Regular Sets: The Pumping Lemma for Regular Sets, Applications of the pumping lemma, Closure properties of regular sets, Myhill-Nerode Theorem and minimization of finite Automata, Minimization Algorithm.

Grammars: Definition, Context free and Context sensitive grammar, Ambiguity regular grammar, Reduced forms, Removal of useless Symbols, unit production and null production Chomsky Normal Form (CNF), Griebach Normal Form (GNF).

Section-C

Pushdown Automata: Introduction to Pushdown Machines, Application of Pushdown Machines

Turing Machines: Deterministic and Non-Deterministic Turing Machines, Design of T.M, Halting problem of T.M., PCP Problem.

Section-D

Chomsky Hierarchies: Chomsky hierarchies of grammars, Unrestricted grammars, Context sensitive languages, Relation between languages of classes.

Computability: Basic concepts, Primitive Recursive Functions.

Text Book:

- Introduction to automata theory, language & computations- Hopcroaft & O.D.Ullman, R Mothwani, 2001, AW

Reference Books:

1. Theory of Computer Sc.(Automata, Languages and computation):K.L.P.Mishra & N.Chandrasekaran, 2000, PHI.
2. Introduction to formal Languages & Automata-Peter Linz, 2001, Narosa Publ..
3. Fundamentals of the Theory of Computation- Principles and Practice by RamondGreenlaw and H. James Hoover, 1998, Harcourt India Pvt. Ltd..
4. Elements of theory of Computation by H.R. Lewis & C.H. Papaditriou, 1998, PHI.
5. Introduction to languages and the Theory of Computation by John C. Martin 2003, T.M.H.

CSE- 307			Web Development			
L	**T**	**P**	**Class**	**Work**	**:**	50 Marks
3	1	–	**Exam**		**:**	100 Mark
			Total		**:**	150 Marks
			Duration	**of Exam :**		3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section A

JAVA: Introduction to JAVA, Basics Data Types, Operators, Classes and Methods, Access Specifiers, Arrays, Inheritance, Polymorphism, Threads, Package and Interfaces, Exception Handling, IO Applets, Generics and Collections

Section B

Basic terms: WWW, XML, HTML, XHTML, W3C.

Descriptive markup: Meta tags for common tasks, semantic tags for aiding search, the doubling code and RDF. Separating style from structure with style sheets: Internal style specifications within HTML, External linked style specification using CSS, page and site design considerations.

Client side programming: Introduction to the JavaScript syntax, the JavaScript object model, Event handling, Output in JavaScript, Forms handling, miscellaneous topics such as cookies, hidden fields, and images; Applications.

Section C

Server side programming: Introduction to Server Side Technologies CGI/ASP/JSP., Programming languages for server Side Scripting, Configuring the server to support CGI, its applications; Input /output operations on the WWW. Forms processing, (using PERL / VBScript / JavaScript)

Section D

Other dynamic content Technologies: Introduction to ASP & JSP, Delivering multimedia over web pages, The VRML idea, The Java phenomenon-applets and Servlets, issues and web development.

Introduction to Microsoft .NET Technology and its comparison with the competing Technologies

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Text Books:
1. JAVA: The Complete Reference, Herbert Schildt
2. Beginning XHTML by Frank Boumpery, Cassandra Greer, Dave Raggett, Jenny Raggett, Sebastian Schnitzenbaumer & ted Wugofski, 2000, WROX press (Indian Shroff Publ. SPD) 1st edition
3. HTML & XHTML: The Definitive Guide by Chuck Musciano, Bill Kennedy, 2000, 4th Edi.

Reference books:
1. XHTML Black Book by Steven Holzner, 2000
2. CGI Programming on the World Wide Web. O'Reilly Associates.
3. Web Technologies By Achyut S Godbole , Atul Kahate, 2003, T.M.H
4. Scott Guelich, Shishir Gundararam, Gunther Birzniek; CGI Programing with Perl 2/e O'Reilly.
5. Doug Tidwell, James Snell, Pavel Kulchenko; Programming Web services, O'Reilly.
6. Intranets by James D.Cimino, 1997, Jaico Publ.
7. Internet and Web Technologies – Raj Kamal, 2002, T.M.H

IT-204   Multimedia   Technologies

L   T   P   Class   Work   :   50 Marks
3   1   –   Exam   :   100 Marks
                                     Total   :   150 Marks

                                       Duration of Exam :3 Hrs.

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Section-A

Basics of Multimedia Technology: Computers, communication and entertainment; multimedia an introduction; framework for multimedia systems; multimedia devices; CD- Audio, CD-ROM, CD-I, presentation devices and the user interface; multimedia presentation and authoring; professional development tools; LANs and multimedia; internet, World Wide Web & multimedia distribution network-ATM & ADSL; multimedia servers & databases; vector graphics; 3D graphics programs; animation techniques; shading; anti aliasing; morphing; video on demand.

Section-B

Image Compression & Standards: Making still images; editing and capturing images; scanning images; computer color models; color palettes; vector drawing; 3D drawing and rendering; JPEG-objectives and architecture; JPEG-DCT encoding and quantization, JPEG statistical coding, JPEG predictive lossless coding; JPEG performance; overview of other image file formats as GIF, TIFF, BMP, PNG etc.

Section-C

Unit-3: Audio & Video: Digital representation of sound; time domain sampled representation; method of encoding the analog signals; subband coding; fourier method; transmission of digital sound; digital audio signal processing; stereophonic & quadraphonic signal processing; editing sampled sound; MPEG Audio; audio compression & decompression; brief survey of speech recognition and generation; audio synthesis; musical instrument digital interface; digital video and image compression; MPEG motion video compression standard; DVI technology; time base media representation and delivery.

Section-D

Virtual Reality: Applications of multimedia, intelligent multimedia system, desktop virtual reality, VR operating system, virtual environment displays and orientation making; visually coupled system requirements; intelligent VR software systems. Applications of environment in various fields.

Text Books:

1. An introduction, Villamil & Molina, Multimedia Mc Milan, 1997
2. multimedia: Sound & Video, Lozano, 1997, PHI, (Que)

Reference Books:

1. Multimedia: Production, planning and delivery, Villamil & Molina,Que, 1997
2. Multimedia on the PC, Sinclair,BPB
3. Multimedia: Making it work, Tay Vaughan, fifth edition, 1994, TMH.
4. Multimedia in Action by James E Shuman, 1997, Wadsworth Publ.,
5. Multimedia in Practice by Jeff coate Judith, 1995,PHI.
6. Multimedia Systems by Koegel, AWL
7. Multimedia Making it Work by Vaughar, etl.
8. Multimedia Systems by John .F. Koegel, 2001, Buford.
9. Multimedia Communications by Halsall & Fred, 2001,AW.

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CSE-309                     Computer   Graphics   Lab.

L   T   P                   Class   Work    :    25  Marks
-   -   2                   Exam            :    25  Marks
                            Total           :    50  Marks

                            Duration   of  Exam :    3  Hrs.
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List of programs to be developed

1. Write a program for 2D line drawing as Raster Graphics Display.

2. Write a program for circle drawing as Raster Graphics Display.

3. Write a program for polygon filling as Raster Graphics Display

4. Write a program for line clipping.

5. Write a program for polygon clipping.

6. Write a program for displaying 3D objects as 2D display using perspective transformation.

7. Write a program for rotation of a 3D object about arbitrary axis.

8. Write a program for Hidden surface removal from a 3D object.

Note:

At least 5 to 10 more exercises to be given by the teacher concerned.

CSE-311   **Web Development & Core JAVA Lab.**

L	**T**	**P**			
–	–	2	**Class Work**	:	25 Marks
			Exam	:	25 Marks
			Total	:	50 Marks

Duration of Exam : 3 Hrs.

1. Java programs using classes & objects and various control constructs such as loops etc , and data structures such as arrays , structures and functions.

2. Java programs for creating Applets for display of Images ,Texts and Animation

3. Programs related to interfaces & packages

4. Input output & Random files programs in java Java

5. Programs using Event driven concept

6. Programs related to Network Programming

7. Development of Web site for the college or newspaper agency.

Books recommended for Lab.

1. Java Elements – Principles of Programming in Java , Duane A. Bailey , Duane W. Bailey, 2000, T.M.H The Java Handbook by Patrick Naughton, TMH, N.Delhi

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IT-208              Multimedia   Technologies   Lab.

L   T   P                        Class   Work    :    25 Marks
–   –   2                        Exam            :    25 Marks
                                 Total           :    50 Marks

                                 Duration   of Exam  :   3 Hrs.
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1. Write a program to justify a text entered by the user on both the left and right hand side. For example, the test " An architect may have a graphics program to draw an entire building but be interested in only ground floor", can be justified in 30 columns as shown below. An architect may have a Graphics programs draw an Entric building but be interested in only ground floor.

2. Study the notes of a piano and stimulate them using the key board and store them in a file.

3. Write a program to read a paragraph and store it to a file name suggested by the author.

4. Devise a routine to produce the animation effect of a square transforming to a triangle and then to a circle.

5. Write a program to show a bitmap image on your computer screen.

6. Create a web page for a clothing company which contains all the details of that company and at-least five links to other web pages.

7. Write a program by which we can split mpeg video into smaller pieces for the purpose of sending it over the web or by small capacity floppy diskettes and then joining them at the destination.

8. Write a program to simulate the game of pool table.

9. Write a program to simulate the game Mine Sweeper.

10. Write a program to play "wave" or "midi" format sound files.

Note

At least 5 to 10 more exercises to be given by the teacher concerned.

EE-329 **Microprocessors and Interfacing Lab**

L	T	P
0	0	2

Class Work : 25 Marks
Exam : 25 Marks
Total : 50 Marks

Duration of Exam : 3 Hrs

List Of Experiments:

1. Study of 8085 Microprocessor kit.

2. Write a program using 8085 and verify for :
   a. Addition of two 8-bit numbers.
   b. Addition of two 8-bit numbers (with carry).

3. Write a program using 8085 and verify for :
   a. 8-bit subtraction (display borrow)
   b. 16-bit subtraction (display borrow)

4. Write a program using 8085 for multiplication of two 8- bit numbers by repeated addition method. Check for minimum number of additions and test for typical data.

5. Write a program using 8085 for multiplication of two 8- bit numbers by bit rotation method and verify.

6. Write a program using 8085 for division of two 8- bit numbers by repeated subtraction method and test for typical data.

7. Write a program using 8085 for dividing two 8- bit numbers by bit rotation method and test for typical data.

8. Study of 8086 microprocessor kit

9. Write a program using 8086 for division of a defined double word (stored in a data segment) by another double Word division and verify.

10. Write a program using 8086 for finding the square root of a given number and verify.

11. Write a program using 8086 for copying 12 bytes of data from source to destination and verify.

12. Write a program using 8086 and verify for:
    a. Finding the largest number from an array.
    b. Finding the smallest number from an array.

13. Write a program using 8086 for arranging an array of numbers in descending order and verify.

14. Write a program using 8086 for arranging an array of numbers in ascending order and verify.

15. Write a program for finding square of a number using look-up table and verify.
.
16. Write a program to interface a two digit number using seven-segment LEDs. Use 8085/8086 microprocessor and 8255 PPI.

17. Write a program to control the operation of stepper motor using 8085/8086 microprocessor and 8255 PPI.

Note:

At least ten experiments have to be performed in the semester out of which seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus of EE-309-C.

CSE-313   **Operating   Systems   Lab.**

L   T   P   **Class   Work**   **:**   25 Marks
–   –   2   **Exam**   **:**   25 Marks
                                Total   **:**   50 Marks

                                Duration   of   Exam   **:**   3 Hrs.

2. Study of WINDOWS 2000 Operating System.

3. Administration of WINDOWS 2000 (including DNS,LDAP, Directory Services)

4. Study of LINUX Operating System (Linux kernel, shell, basic commands pipe & filter commands).

5. Administration of LINUX Operating System.

6. Writing of Shell Scripts (Shell programming).

7. AWK programming.

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

Scheme of studies & Examination
Bachelor of Technology (Computer Science & Engineering)
Semester - VI

S. No.	Course No.	Subject	Teaching Schedule				Examination Schedule (Marks)				Duration of Exam (Hours)
			L	T	P	Total	Marks of class work	Theory	Practical	Total	
1	CSE-302	Principles of Software Engineering (CSE,IT)	3	1	-	4	50	100	-	150	3
2	CSE-304	Intelligent Systems (CSE,IT)	3	1	-	4	50	100	-	150	3
3	IT-305	Computer Networks (CSE, EL & Common with 5 Sem. – IT, AEI)	3	1	-	4	50	100	-	150	3
4	IT-303	Systems Programming & System Administration (Common with 5 Sem. – IT)	3	1		4	50	100	-	150	3
5	CSE-306	Analysis & Design of Algorithms	3	1	-	4	50	100	-	150	3
6	EE-310	Digital System Design (EL,EE,CSE,EI, IC, AEI)	3	1	-	4	50	100	-	150	3
7	CSE-308	Intelligent Systems Lab. (CSE,IT)	-	-	3	3	25	-	25	50	3
8	EE-330	Digital System Design Lab. (EL,EI, IC,CSE, AEI)	-	-	3	3	25	-	25	50	3
9	CSE-310	Computer Network lab	-	-	2	2	25	-	25	50	3
	CSE-312	Visual Programming Lab.	-	-	2	2	25	-	25	50	3
9	GP-302	General Proficiency	-	-	-	-	50	-	-	50	3
		TOTAL	**18**	**6**	**10**	**34**	**450**	**600**	**100**	**1150**	-

Note:

1. Each student has to undergone practical training of 6 weeks during summer vacation and its evaluation shall be carried out in the VII semester.

2. Students will be allowed to use non-programmable scientific calculator. However, sharing of calculator will not be permitted in the examination.

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CSE-302          Principles   of   Software   Engineering
L    T    P                   Class    Work    :    50 Marks
3    1    -                   Exam             :    100 Marks
                             Total            :    150 Marks

                             Duration   of Exam  :    3 Hrs.
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NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Introduction: The process, software products, emergence of software engineering, evolving role of software, software life cycle models, Software Characteristics, Applications, Software crisis.

Software project management: Project management concepts, software process and project metrics Project planning, project size estimation metrics, project estimation Techniques, empirical estimation techniques, COCOMO- A Heuristic estimation techniques, staffing level estimation, team structures, staffing, risk analysis and management, project scheduling and tracking.

Section-B

Requirements Analysis and specification requirements engineering, system modeling and simulation Analysis principles modeling, partitioning Software, prototyping: , Prototyping methods and tools; Specification principles, Representation, the software requirements specification and reviews Analysis Modeling: Data Modeling, Functional modeling and information flow: Data flow diagrams, Behavioral Modeling; The mechanics of structured analysis: Creating entity/ relationship diagram, data flow model, control flow model, the control and process specification; The data dictionary; Other classical analysis methods.

System Design: Design concepts and principles: the design process: Design and software quality, design principles; Design concepts: Abstraction, refinement, modularity, software architecture, control hierarchy, structural partitioning, data structure, software procedure, information hiding; Effective modular design: Functional independence, Cohesion, Coupling; Design Heuristics for effective modularity; The design model; Design documentation.

Section-C

Architectural Design: Software architecture, Data Design: Data modeling, data structures, databases and the data warehouse, Analyzing alternative Architectural Designs ,architectural complexity; Mapping requirements into a software architecture; Transform flow, Transaction flow; Transform mapping: Refining the architectural design.

Testing and maintenance: Software Testing Techniques, software testing fundamentals: objectives, principles, testability; Test case design, white box testing, basis path testing: Control structure testing: Black box testing, testing for specialized environments ,architectures and applications. Software Testing Strategies: Verification and validation, Unit testing, Integration testing,; Validation testing, alpha and beta testing; System testing: Recovery testing, security testing, stress testing, performance testing; The art of debugging, the debugging process debugging approaches. Software re-engineering , reverse engineering ,restructuring, forward engineering.

Section-D

Software Reliability and Quality Assurance :Quality concepts, Software quality assurance , SQA activities; Software reviews: cost impact of software defects, defect amplification and removal; formal technical reviews: The review meeting, review reporting and record keeping, review guidelines; Formal approaches to SQA; Statistical software quality assurance; software reliability: Measures of reliability and availability ,The ISO 9000 Quality standards: The ISO approach to quality assurance systems, The ISO 9001 standard, Software Configuration Management.

Computer Aided software Engineering: CASE, building blocks, integrated case environments and architecture, repository.

Text Book:

- Software Engineering – A Practitioner"s Approach, Roger S. Pressman, 1996, MGH.

Reference Books:

- Fundamentals of software Engineering, Rajib Mall, PHI
- th
- Software Engineering by Ian sommerville, Pearson Edu, 5 edition, 1999, AW,
- Software Engineering – David Gustafson, 2002, T.M.H
- Software Engineering Fundamentals Oxford University, Ali Behforooz and Frederick J. Hudson 1995 JW&S, An Integrated Approach to software engineering by Pankaj jalote , 1991 Narosa,

CSE-304   **Intelligent   Systems**

L	**T**	**P**
3	1	–

Class   Work   :   50 Marks
Exam   :   100 Marks
Total   :   150 Marks

Duration   of Exam :   3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Foundational issues in intelligent systems: Foundation and history of AI, Ai problems and techniques – AI programming

languages, introduction to LISP and PROLOG- problem spaces and searches, blind search strategies, Breadth first- Depth first- heuristic search techniques Hill climbing: best first- A * algorithm AO* algorithm-game tree, Min max algorithms, game playing- alpha beta pruning.

Section-B

Knowledge representation issues, predicate logic- logic programming, semantic nets- frames and inheritance, constraint propagation, representing knowledge using rules, rules based deduction systems.
Reasoning under uncertainty, review of probability, Baye"s probabilistic interferences and Dempster shafer theory, Heuristic methods,

Section-C

Symbolic reasoning under uncertainty, Statistical reasoning, Fuzzy reasoning, Temporal reasoning, Non monotonic reasoning.
Planning, planning in situational calculus, representation for planning, partial order planning algorithm,

Section-D

Learning from examples, discovery as learning, I earning by analogy, explanation based learning, neural nets, genetic algorithms. Principles of Natural language processing, rule based systems architecture, Expert systems, knowledge acquisition concepts, AI application to robotics, and current trends in intelligent systems.

Text Book:

Artificial Intelligence: A Modern Approach,. Russell & Norvig. 1995, Prentice Hall.

Reference Books:

- Artificial Intelligence, Elain Rich and Kevin Knight, 1991, TMH.
- Artificial Intelligence-A modern approach, Staurt Russel and peter norvig, 1998, PHI.
                                      rd
Artificial intelligence, Patrick Henry Winston:, 1992, Addition Wesley 3 Ed.,

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CSE  -306      Analysis  and  Design  of  Algorithms
L  T  P                        Class  Work   :   50 Marks
3  1  -                        Exam         :   100 Marks
                               Total        :   150 Marks

                               Duration  of Exam  :   3 Hrs.
```

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Brief Review of Graphs, Sets and disjoint sets, union, sorting and searching algorithms and their analysis in terms of space and time complexity.

Divide and Conquer: General method, binary search, merge sort, qick sort, selection sort, Strassen"s matrix multiplication algorithms and analysis of algorithms for these problems.

Section-B

Greedy Method: General method, knapsack problem, job sequencing with dead lines, minimum spanning trees, single souce paths and analysis of these problems.

Dynamic Programming: General method, optimal binary search trees, O/I knapsack, the traveling salesperson problem.

Section-C

Unit-5: Back Tracking: General method, 8 queen"s problem, graph colouring, Hamiltonian cycles, analysis of these problems.

Unit-6: Branch and Bound: Method, O/I knapsack and traveling salesperson problem, efficiency considerations. Techniques for algebraic problems, some lower bounds on parallel computations.

Section-D

Unit-7: NP Hard and NP Complete Problems: Basic concepts, Cook"s theorem, NP hard graph and NP scheduling problems some simplified NP hard problems.

Text Books:
- Fundamental of Computer algorithms, Ellis Horowitz and Sartaj Sahni, 1978, Galgotia Publ.,
- Introduction To Algorithms, Thomas H Cormen, Charles E Leiserson And Ronald L Rivest: 1990, TMH

Reference Books:
- The Design and Analysis of Computer Algorithm, Aho A.V. Hopcroft J.E., 1974, Addison Wesley. Algorithms-
- The Construction, Proof and Analysis of Programs, Berlion, P.Bizard, P., 1986. Johan Wiley & Sons, Writing
- Efficient Programs, Bentley, J.L., PHI
- Introduction to Design and Analysis of Algorithm, Goodman, S.E. & Hedetnieni, 1997, MGH.
- Introduction to Computers Science- An algorithms approach , Jean Paul Trembley, Richard B.Bunt, 2002, T.M.H.
- Fundamentals of Algorithms: The Art of Computer Programming Voll, Knuth, D.E.: 1985, Naresh Publ.

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IT-305                    Computer    Networks
L    T    P                           Class  Work    :   50 Marks
3    1    -                           Exam           :   100 Marks
                                      Total          :   150 Marks
```

Duration of Exam : 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

OSI Reference Model and Network Architecture: Introduction to Computer Networks, Example networks ARPANET,

Internet, Private Networks, Network Topologies: Bus-, Star-, Ring-, Hybrid -, Tree -, Complete -, Irregular –Topology; Types of Networks : Local Area Networks, Metropolitan Area Networks, Wide Area Networks; Layering architecture of networks, OSI model, Functions of each layer, Services and Protocols of each layer

Section-B

TCP/IP: Introduction, History of TCP/IP, Layers of TCP/IP, Protocols, Internet Protocol, Transmission Control Protocol , User

Datagram Protocol, IP Addressing, IP address classes, Subnet Addressing, Internet Control Protocols, ARP, RARP, ICMP, Application Layer, Domain Name System, Email – SMTP, POP,IMAP; FTP, NNTP, HTTP, Overview of IP version 6.

Section-C

Local Area Networks: Introduction to LANs, Features of LANs, Components of LANs, Usage of LANs, LAN Standards, IEEE

802 standards, Channel Access Methods, Aloha, CSMA, CSMA/CD, Token Passing, Ethernet, Layer 2 & 3 switching, Fast Ethernet and Gigabit Ethernet, Token Ring, LAN interconnecting devices: Hubs, Switches, Bridges, Routers, Gateways.
Wide Area Networks: Introduction of WANs, Routing, Congestion Control, WAN Technologies, Distributed Queue Dual Bus (DQDB),

Section-D

Synchronous Digital Hierarchy (SDH)/ Synchronous Optical Network (SONET), Asynchronous Transfer Mode (ATM), Frame Relay.,Wireless Links.
Introduction to Network Management: Remote Monitoring Techniques: Polling, Traps, Performance Management, Class of Service, Quality of Service, Security management, Firewalls, VLANs, Proxy Servers, Introduction to Network Operating Systems: Client-Server infrastructure, Windows NT/2000.

Text Book:

Computer Networks (3rd edition), Tanenbaum Andrew S., International edition, 1996.

Reference Books:

Data Communications, Computer Networks and Open Systems (4th edition), Halsall Fred, 2000,
Addison Wesley, Low Price Edition.
Business Data Communications, Fitzgerald Jerry,.
ndComputer Networks – A System Approach, Larry L.
Peterson & Bruce S. Davie, 2 Edition
Computer Networking – ED Tittel , 2002, T.M.H.

IT-303   **Systems Programming & System Administration**

L	**T**	**P**						
			Class Work	:	50	Marks		
3	1	–	**Exam**	:			100	Marks
			Total	:			150	Marks

Duration of Exam : 3 Hrs.

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Evolution of Components Systems Programming, Assemblers, Loaders, Linkers, Macros, Compilers. software tools, Text editors, Interpreters and program generators, Debug Monitors, Programming environment.
Compiler: Brief overview of compilation process, Incremental compiler, Assembler: Problem statement, single phase and two phase assembler, symbol table; Loader schemes, compile and go Loader, general loader schemes, absolute loader, Subroutine linkage, Reallocating loader, Direct linkage Loader, Binders, Linking loader, overlays.

Section-B

Macro language and macro-processor, macro instructions, features of macro facility, macro instruction arguments, conditional macro expansion, macro calls with macro instruction defining macros.
Theoretical Concept of Unix Operating System: Basic features of operating system; File structure: CPU scheduling; Memory management: swapping, demand paging; file system: block and fragments, inodes, directory structure; User to user communication.

Section-C

Getting Started with Unix: User names and groups, logging in; Format of Unix commands; Changing your password; Characters with special meaning; Unix documentation; Files and directories; Current directory, looking at the directory contents, absolute and relative pathnames, some Unix directories and files; Looking at the file contents; File permissions; basic operation on files; changing permission modes; Standard files, standard output; Standard input, standard error; filters and pipelines; Processes; finding out about processes; Stopping background process; Unix editor vi.
Test Manipulation: Inspecting files; File statistics; Searching for patterns; Comparing files; Operating on files; Printing files; Rearranging files; Sorting files; Splitting files; Translating characters; AWK utility.

Section-D

Shell Programming: Programming in the Borne and C-Shell; Wild cards; Simple shell programs; Shell variables; Shell programming constructs; interactive shell scripts; Advanced features.
System Administration: Definition of system administration; Booting the system; Maintaining user accounts; File systems and special files; Backups and restoration; Role and functions of a system manager. Overview of the linux. operating system

Text Books:
- Systems Programming by Donovan, TMH.
- The unix programming environment by Brain Kernighen & Rob Pike, 1984, PHI & Rob Pike.
- Design of the Unix operating system by Maurich Bach, 1986, PHI.
- Introduction to UNIX and LINUX by John Muster, 2003, TMH.

Reference Book:
- Advanced Unix programmer"s Guide by Stephen Prato, BPB
- Unix- Concept and applications by Sumitabha Das, 2002, T.M..H

EE-310   **DIGITAL   SYSTEM   DESIGN**

L	**T**	**P**		**Class**	**Work**	**:**	50 Marks
3	1	0		**Exam**		**:**	100 Marks
				Total		**:**	150 Marks

Duration of Exam : 3 HRS

NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.

Section-A

Introduction: Introduction to Computer-aided design tools for digital systems. Hardware description languages; introduction to

VHDL, data objects, classes and data types, Operators, Overloading, logical operators. Types of delays Entity and Architecture declaration. Introduction to behavioural, dataflow and structural models.

Section-B

Vhdl Statements: Assignment statements, sequential statements and process, conditional statements, case statement Array and loops, resolution functions, Packages and Libraries, concurrent statements.

Subprograms: Application of Functions and Procedures, Structural Modelling, component declaration, structural layout and generics.

Section-C

Combinational Circuit Design: VHDL Models and Simulation of combinational circuits such as Multiplexers, Demultiplexers, encoders, decoders, code converters, comparators, implementation of Boolean functions etc.

Sequential Circuits Design : VHDL Models and Simulation of Sequential Circuits Shift Registers, Counters etc.

Section-D

Design Of Microcomputer : Basic components of a computer, specifications, architecture of a simple microcomputer system, implementation of a simple microcomputer system using VHDL

Design With Cplds And Fpgas : Progr ammable logic devices : ROM, PLAs, PALs, GAL, PEEL, CPLDs and FPGA. Design implementation using CPLDs and FPGAs

Reference Books:

1. IEEE Standard VHDL Language Reference Manual (1993).
2. Digital Design and Modelling with VHDL and Synthesis : KC Chang; IEEE Computer Society Press.
3. "A VHDL Primmer" : Bhasker; Prentice Hall 1995.
4. "Digital System Design using VHDL" : Charles. H.Roth ; PWS (1998).
5. "VHDL-Analysis & Modelling of Digital Systems" : Navabi Z; McGraw Hill.
6. VHDL-IV Edition :Perry; TMH (2002)
7. "Introduction to Digital Systems" : Ercegovac. Lang & Moreno; John Wiley (1999).
8. Fundamentals of Digital Logic with VHDL Design : Brown and Vranesic; TMH (2000)
9. Modern Digital Electronics- III Edition: R.P Jain; TMH (2003).

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CSE-308                     Intelligent    System    Lab.
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L   T   P                         Class    Work      :      25 Marks
-   -   2                         Exam               :      25 Marks
                                  Total              :      50 Marks

                                  Duration   of  Exam :    3 Hrs.
```

1. Study of PROLOG.
Write the following programs using PROLOG.

2. Write a program to solve 8 queens problem.

3. Solve any problem using depth first search.

4. Solve any problem using best first search.

5. Solve 8-puzzle problem using best first search

6. Solve Robot (traversal) problem using means End Analysis.

7. Solve traveling salesman problem.

Note:

At least 5 to 10 more exercises to be given by the teacher concerned.

EE-330   `DIGITAL  SYSTEM  DESIGN   LAB`

```
L   T   P                    CLASS   WORK      :     25 Marks
0   0   2                    EXAM              :     25 Marks
                             TOTAL             :     50 Marks

                             DURATION   OF   EXAM :   3 HRS
```

List Of Experiments:

1. Design all gates using VHDL.

2. Write VHDL programs for the following circuits, check the wave forms and the hardware generated

   a. half adder

   b. full adder

3. Write VHDL programs for the following circuits, check the wave forms and the hardware generated

   a. multiplexer

   b. demultiplexer

4. Write VHDL programs for the following circuits, check the wave forms and the hardware generated

   a. decoder

   b. encoder

5. Write a VHDL program for a comparator and check the wave forms and the hardware generated

6 Write a VHDL program for a code converter and check the wave forms and the hardware generated

7. Write a VHDL program for a FLIPLOP and check the wave forms and the hardware generated

8. Write a VHDL program for a counter and check the wave forms and the hardware generated

9. Write VHDL programs for the following circuits, check the wave forms and the hardware generated

   a.   register

   b.   shift register

10. Implement any three (given above) on FPGA/CPLD kit

Note :

Ten experiments are to be performed out of which at least seven experiments should be performed from above list. Remaining three experiments may either be performed from the above list or designed & set by the concerned institution as per the scope of the syllabus.

CSE-310   **Computer Network   Lab.**

L   T   P   **Class   Work**   **:**   25 Marks
–   –   3   **Exam**   **:**   25 Marks
                                               Total   **:**   50 Marks

                                               Duration   of   Exam :   3 Hrs

This course provides students with hands on training regarding the design, troubleshooting, modeling and evaluation of computer networks. In this course, students are going to experiment in a real test-bed networking environment, and learn about network design and troubleshooting topics and tools such as: network addressing, Address Resolution Protocol (ARP), basic troubleshooting tools (e.g. ping, ICMP), IP routing (e,g, RIP), route discovery (e.g. traceroute), TCP and UDP, IP fragmentation and many others. Student will also be introduced to the network modeling and simulation, and they will have the opportunity to build some simple networking models using the tool and perform simulations that will help them evaluate their design approaches and expected network performance.

L	T	P		Class Work	:	25 Marks
–	–	3		Exam	:	25 Marks
				Total	:	50 Marks
				Duration of Exam :		3 Hrs

Study of Visual Basic 6.0.NET and Visual C++ 6.0.NET.

1) Study Windows API"s. Find out their relationship with MFC classes. Appreciate how they are helpful in finding complexities of windows programming.

2) Get familiar with essential classes in a typical (Document- view architecture) VC++ Program and their relationship with each other.

3) Create an SDI application in VC++ that adds a popup menu to your application which uses File drop down menu attached with the menu bar as the pop-up menu. The pop-up menu should be displayed on the right click of the mouse.

4) Create an SDI application in VC++ using which the user can draw atmost 20 rectangles in the client area. All the rectangles that are drawn should remain visible on the screen even if the window is refreshed. Rectangle should be drawn on the second click of the left mouse button out of the two consecutive clicks. If the user tries to draw more than 20 rectangles, a message should get displayed in the client area that " No more rectangles can be drawn"

5) Create an application in VC++ that shows how menu items can be grayed, disabled and appended at run time.

6) Write a program in VC++ to implement serialization of inbuilt and user defined objects.

7) Write a program in VC++ to create archive class object from CFile class that reads and stores a simple structure (record).

8) Make an Active X control in VC++ derived from a standard control.

9) Write a program in VB to implement a simple calculator.

10) Create a simple database in MS Access Database /Oracle and a simple database application in VB that shows database connectivity through DAO and ADO.

11) Write a simple program that displays an appropriate message when the illegal operation is performed using error handling technique in VB.

12) Write a program in VB to create a notepad.

13) Create a DLL in VB.

Bright students may do the following exercises:

14) Write a program in VC++ to implement a simple calculator.

15) Write a program in VC++ to create a static link library and a dynamic link library.

16) Create a simple database in MS Access Database and a simple database application in VC++ that shows database connectivity through ADO model.

17) Make an Active X control of your own using VB.

18) With the help of VB, create an object of excel application and implement any action on it.