

S-25 March, 2013 AC after Circulars from Circular No.153 & onwards

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DR. BABASAHEB AMBEDKAR MARATHWADA UNIVERSITY**CIRCULAR NO. ACAD/NP/M.E./New Syllabi/190/2013**

It is hereby informed to all concerned that, recommendation of the Faculty of Engineering and Technology, the Hon'ble Vice-Chancellor has accepted the **"NEW Syllabi with Cumulative Grade Point Average [CGPA] for [1] M.E. [Manufacturing Process], [2] M.E. [Automation] and M.E. [CSE & IT]"** on behalf of the **Academic Council Under Section-14(7) of the Maharashtra Universities Act, 1994** as appended herewith.

This is effective from the **Academic Year 2013-2014** and onwards.

All concerned are requested to note the contents of this circular and bring the notice to the students, teachers and staff for their information and necessary action.

University Campus,
Aurangabad-431 004.
REF.NO. ACAD/ NP/ M.E./
NEW SYLLABI / 2013/14101-09
V.C.14[7] A-08.

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(Signature)
Director,
Board of College and
University Development.

Date:- 15-06-2013.

Copy forwarded with compliments to :-

- 1] The Principals, affiliated concerned Colleges, Dr. Babasaheb Ambedkar Marathwada University.
- 2] The Director, University Network & Information Centre, UNIC, with **a request to upload the above all syllabi on University Website [www.bamu.net].**

Copy to :-

- 1] The Controller of Examinations,
- 2] The Superintendent, [Engineering Unit],
- 3] The Programmer [Computer Unit-1] Examinations,
- 4] The Programmer [Computer Unit-2] Examinations,
- 5] The Superintendent, [Eligibility Unit],
- 6] The Director, [E-Suvidha Kendra], in-front of Registrar's Quarter, Dr. Babasaheb Ambedkar Marathwada University,
- 7] The Record Keeper, Dr. Babasaheb Ambedkar Marathwada University.

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**DR. BABASAHEB AMBEDKAR
MARATHWADA UNIVERSITY,
AURANGABAD.**



New Syllabus of

M.E.

(COMPUTER SCIENCE

AND

INFORMATION TECHNOLOGY)

[Effective from the Academic Year 2013-14 & onwards]

Dr. Babasaheb Ambedkar Marathwada University Aurangabad.

Faculty of Engineering & Technology

Rules and Regulations for M.E. & M.Tech. -2014

➤ **What is a credit system**

A credit system is a systematic way of describing an educational program by attaching credits to its components. The definition of credits in higher education systems may be based on different parameters, such as student workload, learning outcomes and contact hours.

➤ **Advantages of the Credit System**

- Represents a much-required shift in focus from teacher-centric to learner-centric education since the work load estimated is based on the investment of time in learning, not in teaching.
- Helps to record course work and to document learner work load realistically since all activities are taken into account-not only the time learners spend in lectures or seminars but also the time they need for individual learning and the preparation of examinations etc.
- Segments learning experience into calibrated units, which can be accumulated in order to gain an academic award.
- Helps self-paced learning. Learners may undertake as many credits as they can cope with without having to repeat all the courses in a given semester if they fail in one or more courses. Alternatively, they can choose other courses and continue their studies.

➤ **What is Grading?**

The word Grade derived from the Latin word gradus, meaning, step. Grading, in the educational context is a method of reporting the result of a learner's performance subsequent to his evaluation. It involves a set of alphabets which are clearly defined and designated and uniformly understood by all the stake holders. A properly introduced grading system not only provides for a comparison of the learner's performance but it



also indicate the quality of performance with respect to the amount of efforts put in and the amount of knowledge acquired at the end of the courses by the learners.

➤ **CURRICULUM:**

1.1 Curriculum:

Every program with specialization has a prescribed course structure which in general terms is known as Curriculum. It prescribes course to be studied in each semester; the relevant information containing course structure along with detail syllabus for each course of each program is updated periodically and is uploaded on the website.

1.2 Semesters:

The Faculty of Engineering & Technology implements a credit based curriculum and grade based evolution system for P.G. program is of four semesters. The academic courses are delivered in the first two semesters. Dissertation work is carried out by a student in the third and fourth semester. The first semester begins in the last week of July ends by the last week of November while the second semester begins in the first week of January and ends by the second week of May. Total duration for each semester is generally of 20 weeks including the period of examination, evaluation and grade declaration.

1.3 Course Credit:

Education is organized around the semester-based credit system of study. The prominent features of the credit system are a process of continuous evaluation of a student's performance/progress and flexibility to allow a student to progress at an optimum pace suited to his/her ability or convenience, subject to fulfilling minimum requirements for continuation.

A student's performance/progress is measured by the number of credits that he/she has earned, i.e. completed satisfactorily. Based on the course credits and grades obtained by the student, grade point average is calculated. A minimum grade point average is required to be maintained for satisfactory progress and continuation in the program. Also a minimum number of earned credits and a minimum grade point average should be acquired in order to qualify for the degree. All programmes are defined by the total credit requirement and a pattern of credit distribution over courses of different categories.

1.4 Course credits assignment

Each courses, except a few special courses, has a certain number of credits assigned to it depending upon its lecture, tutorial and laboratory contact hours in a week. This weightage is also indicative of the academic expectation that includes in-class contact and self-study outside of class hours.

Lectures and Tutorials: One lecture or tutorial hour per week per semester is assigned one credit.

Seminar/Contact Hours per week per semester is assigned one credit

Practical/Laboratory: One laboratory hour per week per semester is assigned half credit.

Example: Course: XYZ Engg: 3 credits (3-1-2)

The credits indicated for this course are computed as follows:

3 hours/week lectures = 3 credits

1 hours/week tutorial = 1 credit

2 hours/week practical = $2 \times 0.5 = 1$ credit

2 hours/week seminar = $2 \times 0.5 = 1$ credit

Dissertation seminar/Contact Hours = $1 \times 1 = 1$ credit

(3-1-2) 3 credit course = (3 h Lectures + 1 h Tutorial + 2 h Practical/Dissertation seminar) per week i.e. 6 Contact hours per week

1.5 Earning Credits

At the end of every course, a letter grade is awarded in each course for which a student had registered. On obtaining a pass grade, the student accumulates the course credits as earned credits. A student's performance is measured by the number of credits that he/she has earned and by the weighted grade point average.

The credit system enables continuous evaluation of a student's performance, and allows the students to progress at an optimum pace suited to individual ability and convenience, subject to fulfilling minimum requirement for continuation.

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1.6 Evaluation System

1. Semester Grade Point Average (SGPA) =

$$\frac{\text{SUM (course credits in passed courses X earned grade points)}}{\text{SUM (Course credits in registered courses)}}$$
2. Cumulative Grade Point Average (CGPA) =

$$\frac{\text{SUM (course credits in passed courses X earned grade points) of all Semester}}{\text{SUM (Course credits in registered courses) of all Semester}}$$
3. At the end of M.E & M. Tech Program, student will be placed in any one of the divisions as detailed below. (According to AICTE Handbooks 2013-2014)
 - Ist Division with distinction : CGPA \geq 8.25 and above
 - Ist Division : CGPA \geq 6.75 and $<$ 8.25
 - IInd Division : CGPA \geq 6.75 and $<$ 6.25

As per AICTE Handbook (2013-14), new gradation suggested as follows,

Table 1

Grade Point	Equivalent Range
6.25	55%
6.75	60%
7.25	65%
7.75	70%
8.25	75%

Conversion of CGPA to percentage marks for CGPA \geq 5.0 can be obtained using equations.

$$\text{Percentage marks} = (\text{CGPA} \times 10) - 7.5$$

An example of these calculations is given below:

Typically one example for academic performance calculations of semester –I

Table 2

Course No. (1)	Course Credit (2)	Grade Awards (3)	Earned Credit (4)	Grade Points (5)	Points Secured (6)=(4) x (5)
Subject 1	4	B	4	6	24
Subject 2	4	C	4	5	20
Subject 3	4	O	4	10	40
Subject 4	4	A+	4	8	32
Subject 5	4	C	4	5	20
Lab-1	2	A+	2	9	18
Lab-2	1	A+	1	9	9
Seminar-I	1	A+	1	9	9
Total	24		24	61	172

$$1. \text{ Semester Grade Point Average (SGPA)} = \frac{(172)}{(24)} = 7.16$$

$$2. \text{ Cumulative Grade Point Average (CGPA)} = \frac{\text{Cumulative points earned in all passed courses} = 172 \text{ (past semester)} + 172 \text{ (this sem.)} = 344}{\text{Total Credits}} = 7.16$$

$$\text{Cumulative earned credits} = 24 \text{ (past semesters)} + 24 \text{ (this sem)} = 48$$

$$\frac{\sum (172 + 172)}{\sum (24 + 24)} = 7.16$$

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➤ **System Evaluation Table****Table 3**

Grade	Grade Points	Marks Obtained (%)	Description Performance
		Regular Semester	
O	10	91-100	Outstanding
A++	09	86-90	Excellent
A+	08	76-85	Very Good
A	07	66-75	Good
B	06	56-65	Fair
C	05	46-55	Average
D	04	40-45	Poor
F	00	Below 40	Fail
EE			Incomplete
WW			Withdrawal
XX	--	--	Detained
ABSENT	--	--	Absent
PP	--	--	Passed (Audit Course)
NP	--	--	Not Passed (Audit Course)

➤ **Grade Awards:**

- i) A ten point rating scale shall be used for the evaluation of the performance of the student to provide letter grade for each course and overall grade for the Master's Programme. Grade points are based on the total number of marks obtained by him/her in all the heads of examination of the course. These grade points and their equivalent range of marks are shown separately in Table-4.

Table 4: Ten point grades and grade description

Sr.No.	Equivalent Percentage	Grade Points	Grade	Grade Description
1	90.00 – 100	10	O	Outstanding
2	80.00 – 89.99	9	A++	Excellent
3	70.00 – 79.99	8	A+	Exceptional
4	60.00 – 69.99	7	A	Very Good
5	55.00 – 59.99	6	B+	Good
6	50.00 – 54.99	5.5	B	Fair
7	45.00 – 49.99	5	C+	Average
8	40.01 – 44.99	4.5	C	Below Average
9	40	4.00	D	Pass
10	<40	0.00	F	Fail

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- ii) Non appearance in any examination/assessment shall be treated as the student have secured zero mark in that subject examination/assessment.
- iii) Minimum D grade (4.00 grade points) shall be the limit to clear/pass the course/subject. A student with F grade will be considered as 'failed' in the concerned course and he/she has to clear the course by reappearing in the next successive semester examinations.
- iv) Every student shall be awarded Grade points out of maximum 10 points in each subject (based on 10 Point Scale). Based on the Grade points obtained in each subject, Semester Grade Point Average (SGPA) and then Cumulative Grade Point Average (CGPA) shall be computed. Results will be announced at the end of each semester and cumulative Grade card with CGPA will be given on completion of the course.

Proposed Coding System of M.E/M.Tech Subjects

Six Digit Code for a subject (PG Course)

	Digits →	1 2 3	4	5 6
Sr. No.	Branch ↓	Branch code	Year	Subject
1	Electronics	MEX	PG I year – 6	Semester –I/III
2	Electronics & Communication	MEC	PG II Year - 7	1-20 Theory
3	Electronics & Telecom.	MET		21-30 Practical
4	Digital Communication	MDC		31 Dissertation-I
5	Embedded System	MES		41-49 Electives
6	Structure Engineering	MSE		Semester –II/IV
7	Environmental Engineering	MEV		51-70 Theory
8	Water Resource Engineering	MWR		71-80 Practical
9	Computer Engineering	MCE		81 Dissertation-II
10	Computer Network	MCN		91-99 Electives
11	Software Engineering	MSW		
12	Mechanical Engineering	MME		
13	Thermal Engineering	MTE		
14	CAD/CAM	MCC		
15	Manufacturing	MMF		
16	Heat Power	MHP		
17	Design Engineering	MDE		
18	Machine Design	MMD		
19	Automation	MEA		
20	Chemical Engineering	MCH		
21	Computer & IT	MCI		
22	Production Process	MMP		
23	M.Tech Computer Science	MTC		
24	M.Tech Food Processing	MTF		
25	M.Tech Mechanical	MTM		

Note: - Kindly, Allot Same Code for same Electives/ subjects for different branches to avoid repetitions of Question papers/settings/assessments.

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**DEGREE OF MASTER OF ENGINEERING/TECHNOLOGY
(Course with effective from academic year: 2013-2014)**

I	1	The examination for the Degree of Master of Engineering & Technology will be held in four semesters, M.E./M.Tech. Semester-I, M.E./M.Tech. Semester-II, M.E. /M.Tech Semester-III, and M.E./M.Tech. Semester-IV in case of full time course. And for part time additional semester V & VI
II	1	Rules & Eligibility Rule for admission to P.G. Degree course in Engineering and Technology as per rules and regulation of AICTE/DTE & Dr. Babasaheb Ambedkar Marathwada University, Aurangabad.
III	1	Evaluation method Each theory course will be of 100 marks and be divided in to internal examination of 20 marks and semester examination of 80 marks (20+80=100 marks). Each practical course will be of 50/100 marks
	2	There shall be minimum two class tests within a semester. First based on 30% syllabus taught and second based on 30% syllabus taught. The setting of question paper and assessment will be done by the concerned teacher who has taught the syllabus. Average marks obtained out of two examinations will be considered for the preparation of final sectional marks/ grade.
	3	The Question papers in theory subjects shall be set by the Examiners appointed for the purpose by the University on the recommendations of the Board of studies of the concerned PG Course.
	4	The assessment of the Practical for any subject will be done by recognized post-graduate teacher appointed by University.
	5	To pass the examination a candidate must obtain a minimum CGPA of 6.25 (CGPA to the scale of 10).
	6	Candidate who secures $CGPA \geq 6.25$ and $CGPA < 6.75$ declared to have passed examination in second class.
	7	Candidate who secures $CGPA \geq 6.75$ and $CGPA < 8.25$ declared to have passed examination in first class.
	8	Candidate who secures $CGPA \geq 8.25$ declared to have passed examination in

		first class with distinction.
IV	1	In case candidates fails to get less than D grade in one or more heads of passing examination, he will be allowed at his option, to reappear for only those heads of passing in which he has failed or got less than D grade at subsequent examinations.
	2	The grades obtained by the candidate in any head of passing at the examination will be carried forward unless the candidates reappear for the head of passing in accordance with ref. IV (1)
	3	In case the candidate passes in all heads of passing under M.E./M.Tech. Semester-I, M.E./M.Tech. Semester-II examination and obtained a minimum CGPA of 6.25 in M.E./M.Tech Semester-I, M.E./M.Tech Semester-II taken together as required under ref. II(2) above, he will not be allowed to reappear for any head of passing under M.E. Semester-I, M.E. Semester-II in accordance with ref. III(5)
	4	A candidate will not be allowed to appear for M.E. /M.Tech Semester-III examination unless he passes in all heads of passing under M.E. /M.Tech Semester-I, M.E./M.Tech Semester-II examination and obtains a minimum CGPA of 6.25.
	5	Whenever a candidate reappears for M.E. /M.Tech Semester-III and M.E./M.Tech. Semester-IV examinations he will have to resubmit the dissertation with suitable modification and must also reappear for oral examination on it.
	6	A candidate registered for M.E./M.Tech Examination must clear his examination within five years from the date of registration.
V	Attendance Requirement	
	1	Each semester of the course shall be treated as a separate unit for calculation of the attendance
	2	A candidate shall be considered to have satisfied the attendance requirement if he/she has attended not less 75% of the class in each subject of all the semesters (Theory, Laboratory, Semester Practical training and Dissertation work) actually conducted up to the end of the semester.
	3	A Candidate, who does not satisfy the attendance required, mentioned as above, shall not be eligible to appear for the Examination of that semester and

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		shall be required to repeat that semester along with regular students later.
	4	The Principal of the concerned College shall display regularly, the list of such candidates who fall short of attendance, on the Notice Boards.
	5	The list of the candidates falling short of attendance shall be sent to the University at least one week prior to the commencement of theory/practical examination, whichever is earlier.
VI		The following are the syllabi in the various subjects of the examination for the Degree of Master of Engineering/Technology.

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Faculty of Engineering and Technology
Tentative Structure for ME (COMPUTER SCIENCE AND INFORMATION TECHNOLOGY)

Sub	Semester - I	Contact Hrs/Week				Examination Scheme (Marks)						
		L	T	P	Total	CT	TH	TW	P	Total	Duration of Theory Examination	Credit
Part – I												
1	Information Theory and Coding	3	1	-	4	20	80	-	-	100	3 Hrs.	4
2	Advanced Operating System	3	1	-	4	20	80	-	-	100	3 Hrs.	4
3	Advanced Computer Networks	3	1	-	4	20	80	-	-	100	3 Hrs.	4
4	Advanced Data Mining	3	1	-	4	20	80	-	-	100	3 Hrs.	4
5	Elective - I	3	1	-	4	20	80	-	-	100	3 Hrs.	4
6	UNP Lab.	-	-	4	4	-	-	50	-	50	-	2
7	Data Mining Lab.	-	-	2	2	-	-	-	50	50	-	1
8	Seminar.	-	-	2	2	-	-	-	50	50	-	1
Total of Part – I		15	5	8	28	100	400	50	100	650		24

L: Lecture hours per week **T:** Tutorial Hours per week **P:** Practical hours per week

CT: Class Test **TH:** University Theory Examination **TW:** Termwork

P: Practical / Oral Examination

Elective – I

1. Advanced Digital Communication.
2. Information Retrieval.
3. System Simulation Modeling.



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Faculty of Engineering and Technology
Tentative Structure for ME (COMPUTER SCIENCE AND INFORMATION TECHNOLOGY)

Sub	Semester – II	Contact Hrs/Week				Examination Scheme (Marks)						Credit
		L	T	P	Total	CT	TH	TW	P	Total	Duration of Theory Examination	
Part – II												
1	Distributed Database.	3	1	-	4	20	80	-	-	100	3 Hrs.	4
2	Information and Network Security.	3	1	-	4	20	80	-	-	100	3 Hrs.	4
3	Advanced Compiler Design and Implementation.	3	1	-	4	20	80	-	-	100	3 Hrs.	4
4	Soft Computing.	3	1	-	4	20	80	-	-	100	3 Hrs.	4
5	Elective – II	3	1	-	4	20	80	-	-	100	3 Hrs.	4
6	Soft Computing Lab.	-	-	4	4	-	-	50	-	50	-	2
7	Compiler Design Lab.	-	-	2	2	-	-	-	50	50	-	1
8	Mini Project.	-	-	2	2	-	-	-	50	50	-	1
Total of Part – II		15	5	8	28	100	400	50	100	650		24

L: Lecture hours per week**T:** Tutorial Hours per week**P:** Practical hours per week**CT:** Class Test**TH:** University Theory Examination**TW:** Termwork**P:** Practical / Oral Examination**Elective – II**

1. Advanced Algorithm.
2. Storage Area Networks.
3. Adhoc and Sensor Network.

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Faculty of Engineering and Technology
Tentative Structure for ME (COMPUTER SCIENCE AND INFORMATION TECHNOLOGY)

Sub	Semester – III	Contact Hrs/Week				Examination Scheme (Marks)						Credit
		L	T	P	Total	CT	TH	TW	P	Total	Duration of Theory Examination	
Part – III												
I	Dissertation (Part - I)	-	-	12	12	-	-	-	50	50	-	12
Total of Part – III				12	12				50	50	-	12

Sub	Semester – IV	Contact Hrs/Week				Examination Scheme (Marks)						Credit
		L	T	P	Total	CT	TH	TW	P	Total	Duration of Theory Examination	
Part – IV												
I	Dissertation (Part - II)	-	-	20	20	-	-	50	200	250	-	20
Total of Part – IV				20	20			50	200	250		20

L: Lecture hours per week

T: Tutorial Hours per week

P: Practical hours per week

CT: Class Test

TH: University Theory Examination TW: Termwork

P: Practical / Oral Examination

$$\begin{aligned} \text{Total:- SEM-I + SEM-II + SEM-III + SEM-IV} \\ = 24 + 24 + 12 + 20 \\ = 80 \end{aligned}$$

$$\begin{aligned} \text{Total Contact Hours} \\ \text{SEM-I + SEM-II + SEM-III + SEM-IV} \\ = 28 + 28 + 12 + 20 = 88 \end{aligned}$$

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SEMESTER - I

CSIT101 - INFORMATION THEORY AND CODING (ITC)

Teaching Scheme:

Lecture - 03 Hrs.

Tutorial - 01 Hrs.

Examination Scheme:

Theory Paper - 80 Marks

Class Test - 20 Marks

1. **SIGNALS AND SYSTEMS** **(6 HRS)**
Introduction, Analog to digital conversion, Sampling theorem, Classification of signals, Discrete time signals and systems, Simple manipulation on discrete time signals, Input/Output description of system, Classification of discrete time systems, Interconnection of discrete time systems.
2. **SOURCE CODING** **(8 HRS)**
Introduction to information theory, Uncertainty and information, Average mutual information and entropy, Information measure, Source coding theorem, Huffman coding, The Lempel-Ziv algorithm. Mathematical representation of information.
3. **CHANNEL CAPACITY AND CODING** **(6 HRS)**
Introduction, Types of sources and channels, Channel models, Channel capacity, Channel coding, Information capacity theorem, Shannon's theorem, the Shannon limit random selection of codes
4. **LINEAR BLOCK CODES** **(6 HRS)**
Introduction to error correcting codes, Basic definitions, Matrix description of linear block codes, Equivalent codes, Parity check matrix, Syndrome decoding, Perfect codes, Hamming codes.
5. **CYCLIC CODES** **(6 HRS)**
Introduction to Cyclic codes, Polynomials the division algorithm for polynomials, A method for generating cyclic codes, Matrix description of cyclic codes burst error correction, Cyclic redundancy (CRC) codes, Circuit implementation for cyclic codes.
6. **CONVOLUTION CODES** **(8 HRS)**
Introduction, Generator Matrix, Parity Check Matrices, Specific examples of Block Codes, Cyclic Codes, Generator Polynomials, Encoder and decoder arrangements, Forward error correction and detection codes and their efficiencies.

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REFERENCES:

1. Simon Haykin, "*Digital Communication*", John Willey, 1998.
2. Ranjan Bose, "*Fundamentals of Information Theory*", *Coding and Cryptography* TMHI, 2002.
3. N. Abramson, "*Information and Coding*", Mc-Graw Hill.
4. Richard B. Wells, "*Applied Coding and Information Theory for Engineers*", Pearson Education.
5. M. Mansurpur, "*Introduction to Information Theory*", Mc-Graw Hill, 1987.

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CSIT102 - ADVANCED OPERATING SYSTEM

Teaching Scheme:

Lecture - 03 Hrs.

Tutorial - 01 Hrs.

Examination Scheme:

Theory Paper - 80 Marks

Class Test - 20 Marks

1. **OPERATING SYSTEM** (8 HRS)
Introduction - Operating systems – CPU Scheduling approaches – Process synchronization Semaphores – Deadlocks – Handling deadlocks.
2. **DISTRIBUTED SYSTEMS** (8 HRS)
Introduction - Advantages of distributed system over centralized system, Limitations of Distributed system; Design issues
3. **COMMUNICATION IN DISTRIBUTED SYSTEM** (8 HRS)
Communication in Distributed systems – ATM, Client-Server model, Distributed operating system – Communication primitives – Message Passing Model, Remote Procedure Call.
4. **SYNCHRONIZATION IN DISTRIBUTED SYSTEMS** (8 HRS)
Clock synchronization–Lamport’s logical clock, Mutual exclusion – Non token based and token based algorithm; atomic transactions; Distributed deadlock detection and prevention.
5. **DISTRIBUTED RESOURCE MANAGEMENT** (8 HRS)
Distributed Shared Memory (DSM) – Memory coherence, Page based DSM, Shared variable DSM, Object based DSM;

TEXT BOOKS:

1. Andrew S. Tanenbaum, “*Distributed Operating Systems*”, Pearson Education Asia, 1995.
2. Silberschatz, Galvin, “*Operating System Concepts*”, John Wiley, 2003.
Stallings, “*Operating system*”, PHI, New Delhi, 2004

REFERENCES:

1. Mukesh singhal and Niranjana G. Shivarathri, “*Advanced Concepts in Operating Systems*”, Tata McGraw Hill, 1994..
2. W. Richard Stevens, “*UNIX Network Programming*”, PHI 1998.

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CSIT103 - ADVANCED COMPUTER NETWORKS

Teaching Scheme:

Lecture - 03 Hrs.

Tutorial - 01 Hrs.

Examination Scheme:

Theory Paper - 80 Marks

Class Test - 20 Marks

1. REVIEW**(8 HRS)**

Computer Networks and the Internet: What is the Internet, The Network edge, The Network core, Access Networks and Physical media, ISPs and Internet Backbones, Delay and Loss in Packet-Switched Networks, History of Computer Networking and the Internet - Foundation of Networking Protocols: 5-layer TCP/IP Model, 7-Layer OSI Model, Internet Protocols and Addressing, Equal-Sized Packets Model: ATM - Networking Devices: Multiplexers, Modems and Internet Access Devices, Switching and Routing Devices, Router Structure.

2. THE LINK LAYER AND LOCAL AREA NETWORKS**(8 HRS)**

Link Layer: Introduction and Services, Error-Detection and Error-Correction techniques, Multiple Access Protocols, Link Layer Addressing, Ethernet, Interconnections: Hubs and Switches, PPP: The Point-to-Point Protocol, Link Virtualization - Routing and Internetworking: Network-Layer Routing, Least-Cost-Path algorithms, Non-Least-Cost-Path algorithms, Intradomain Routing Protocols, Interdomain Routing Protocols, Congestion Control at Network Layer.

3. LOGICAL ADDRESSING**(8 HRS)**

IPv4 Addresses, IPv6 Addresses - Internet Protocol: Internetworking, IPv4, IPv6, Transition from IPv4 to IPv6 – Multicasting Techniques and Protocols: Basic Definitions and Techniques, Intradomain Multicast Protocols, Interdomain Multicast Protocols, Node-Level Multicast algorithms - Transport and End-to-End Protocols: Transport Layer, Transmission Control Protocol (TCP), User Datagram Protocol (UDP), Mobile Transport Protocols, TCP Congestion Control – Application Layer: Principles of Network Applications, The Web and HTTP, File Transfer: FTP, Electronic Mail in the Internet, Domain Name System (DNS), P2P File Sharing, Socket Programming with TCP and UDP, Building a Simple Web Server.

4. WIRELESS NETWORKS AND MOBILE IP**(8 HRS)**

Infrastructure of Wireless Networks, Wireless LAN Technologies, IEEE 802.11 Wireless Standard, Cellular Networks, Mobile IP, Wireless Mesh Networks (WMNs) - Optical Networks and WDM Systems: Overview of Optical Networks, Basic Optical Networking

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Devices, Large-Scale Optical Switches, Optical Routers, Wavelength Allocation in Networks, Case Study: An All-Optical Switch.

5. VPNS, TUNNELING AND OVERLAY NETWORKS (8 HRS)

Virtual Private Networks (VPNs), Multiprotocol Label Switching (MPLS), Overlay Networks – VoIP and Multimedia Networking: Overview of IP Telephony, VoIP Signaling Protocols, Real-Time Media Transport Protocols, Distributed Multimedia Networking, Stream Control Transmission Protocol - Mobile Ad-Hoc Networks: Overview of Wireless Ad-Hoc Networks, Routing in Ad-Hoc Networks, Routing Protocols for Ad-Hoc Networks – Wireless Sensor Networks: Sensor Networks and Protocol Structures, Communication Energy Model, Clustering Protocols, Routing Protocols.

TEXT BOOKS:

1. Nader F. Mir, “*Computer and communication Network*”, Pearson Education 2007.
2. James F. Kurose, Keith W. Ross, “*Computer Networking: A Top-Down Approach Featuring the Internet*”, Third Edition, Pearson Education, 2007
3. A. Farrel, “*The Internet and Its Protocols*”, Elsevier

REFERENCES:

1. Andrew S. Tanenbaum, “*Computer Networks*”, Fourth Edition, Prentice Hall
2. Tomsho, Ed Tittel, David Johnson Greg, “*Guide to Networking Essentials*”, Fifth Edition, Thomson.
3. S. Keshav, “*An Engineering Approach to Computer Networking*”.
4. Behrouz A. Forouzan, “*Data Communication and Networking*”, Fourth Edition, Tata McGraw Hill, 2007.

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CSIT104 - ADVANCED DATA MINING

Teaching Scheme:

Lecture - 03 Hrs.

Tutorial - 01 Hrs.

Examination Scheme:

Theory Paper - 80 Marks

Class Test - 20 Marks

1. INTRODUCTION**(6 HRS)**

What is Data Mining? Motivating Challenges; The origins of data mining; Data Mining Tasks. Data: Types of Data; Data Quality; Data Preprocessing; Measures of Similarity and Dissimilarity.

2. CLASSIFICATION**(8 HRS)**

Preliminaries; General approach to solving a classification problem; Decision tree induction; Model overfitting; Evaluating the performance of a classifier; Methods for Comparing Classifiers; Rule -based classifier; Nearest-neighbor classifier; Bayesian Classifiers.

3. ASSOCIATION ANALYSIS**(8 HRS)**

Problem Definition; Frequent Itemset generation; Rule Generation; Compact representation of frequent itemsets; Alternative methods for generating frequent itemsets; FP-Growth algorithm, Evaluation of association patterns.

4. CLUSTER ANALYSIS**(8 HRS)**

Overview, K-means, Agglomerative hierarchical clustering, DBSCAN, Overview of Cluster Evaluation.

5. FURTHER TOPICS IN DATA MINING**(10 HRS)**

Multidimensional analysis and descriptive mining of complex data objects; Spatial data mining; Multimedia data mining; Text mining; Mining the www.Outlier analysis.

Applications: Data mining applications; Data mining system products and research prototypes; Additional themes on Data mining; Social impact of Data mining; Trends in Data mining.

TEXT BOOKS:

1. Pang-Ning Tan, Michael Steinbach, Vipin Kumar, "*Introduction to Data Mining*", Pearson Education, 2007.
2. Jiawei Han and Micheline Kamber, "*Data Mining – Concepts and Techniques*", 2nd Edition, Morgan Kaufmann, 2006.

Draft Copy

REFERENCES:

1. K.P. Soman, Shyam Diwakar, V. Ajay, "*Insight into Data Mining*", Theory and Practice, PHI, 2006.

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CSIT105 - EL-I ADVANCED DIGITAL COMMUNICATION

Teaching Scheme:

Lecture - 03 Hrs.

Tutorial - 01 Hrs.

Examination Scheme:

Theory Paper - 80 Marks

Class Test - 20 Marks

1. DIGITAL TRANSMISSION FUNDAMENTALS (8 HRS)

Digital Representation of Information, Why Digital Communications. Digital Representation of Analog Signals: Elements of Digital Communication and Characterization of Communication Channels, Fundamental Limits on Digital Transmission, Line Coding; Modems and Digital Modulation Properties of Media and Digital Transmission Systems: Error Detection and Correction: Two Dimensional Parity Checks, Internet Checksum, Polynomial Codes, Standardized Polynomial Codes, Error Detecting Capability of a Polynomial Code.

2. WAVE FORM CODING TECHNIQUE (8 HRS)

Pulse code modulation, Channel. Noise and error probability, Differential pulse code modulation, Delta modulation, coding speech at low bit rates, Applications.

3. BASE BAND SHAPING FOR DATA TRANSMISSION (8 HRS)

Discrete PAM signals, Inter-symbol interference (ISI), Nyquist criterion for distortionless Baseband binary transmission, correlative coding, Eypattern, transmission, correlative coding, Eye-patterns Based and M-ary PAM system, Adoptive Equalization. The zero forcing algorithms, The LMA algorithm.

4. DIGITAL MODULATION TECHNIQUE (8 HRS)

Digital Modulation Formats, Coherent Binary modulation techniques, Coherent quadrature Modulation technique, No coherent binary modulation technique comparison of binary and quadrature modulation technique , M-ary Modulation technique, Power spectra, bandwidth efficiency, M-ary modulation formats viewed in the lights of the channel capacity, effect of inter symbol interference, Bit verses symbol Error Probability.

REFERENCES:

1. Alberto Leon – Garcia and IndraWidjaja, “*Communication Networks -Fundamental Concepts and Key architectures*”, 2nd edition Tata McGraw-Hill, 2000.
2. Simon Haykin, “*Digital Communication*”, 4th Edition, John Wiley and Sons, 2000
3. John G Proakis, “*Digital Communications*”, 3rd Edition, McGraw Hill, 2006
4. Leon W Couch, “*Analog / Digital Communication*”, 5th Edition, PHI, 2007

Draft Copy

CSIT105 - EL-I INFORMATION RETRIEVAL

Teaching Scheme:

Lecture - 03 Hrs.

Tutorial - 01 Hrs.

Examination Scheme:

Theory Paper - 80 Marks

Class Test - 20 Marks

1. UNIT-I**(8 HRS)**

Introduction: Motivation, Basic concepts, Past, present, and future, The retrieval process.

Modeling: Introduction, A taxonomy of information retrieval models, Retrieval: Adhoc and filtering, A formal characterization of IR models, Classic information retrieval, Alternative set theoretic models, Alternative algebraic models, Alternative probabilistic models, Structured text retrieval models, Models for browsing.

2. UNIT-II**(8 HRS)**

Retrieval Evaluation: Introduction, Retrieval performance evaluation, Reference collections.

Query Languages: Introduction, keyword-based querying, Pattern matching, Structural queries, Query protocols.

3. UNIT-III**(8HRS)**

Text and Multimedia Languages and Properties: Introduction, Metadata, Text, Markup languages, Multimedia.

Text Operations: Introduction, Document preprocessing, Document clustering, Text compression, Comparing text compression techniques.

4. UNIT-IV**(8 HRS)**

Indexing and Searching: Introduction; Inverted Files; Other indices for text; Boolean queries; Sequential searching; Pattern matching; Structural queries; Compression.

5. UNIT-V**(8 HRS)**

Parallel and Distributed IR: Introduction, Parallel IR, Distributed IR. User Interfaces and Visualization: Introduction, Human-Computer interaction, The information access process, Starting points, Query specification, Context, Using relevance judgments, Interface support for the search process.

TEXT BOOKS:

1. Ricardo Baeza-Yates, Berthier Ribeiro-Neto, "Modern Information Retrieval", Pearson, 1999.

Draft Copy

REFERENCES:

1. David A. Grossman, Ophir Frieder, "*Information Retrieval Algorithms and Heuristics*", 2nd Edition, Springer, 2004
2. William B. Frakes, Ricardo Baeza-Yates (Editors), "*Information Retrieval Data Structures and Algorithms*", Pearson Education, 1992.

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CSIT105 - EL-I SYSTEM SIMULATION MODELING

Teaching Scheme:

Lecture - 03 Hrs.

Tutorial - 01 Hrs.

Examination Scheme:

Theory Paper - 80 Marks

Class Test - 20 Marks

1. INTRODUCTION (8 HRS)

When simulation is the appropriate tool and when it is not appropriate; Advantages and disadvantages of Simulation; Areas of application; Systems and system environment; Components of a system; Discrete and continuous systems; Model of a system; Types of Models; Discrete-Event System Simulation; Steps in a Simulation Study.

2. GENERAL PRINCIPLES, SIMULATION SOFTWARE (8 HRS)

Concepts in Discrete-Event Simulation: The Event-Scheduling / Time-Advance Algorithm, World Views, Manual simulation Using Event Scheduling; List processing. Simulation in Java; Simulation in GPSS.

STATISTICAL MODELS IN SIMULATION:

Review of terminology and concepts; Useful statistical models; Discrete distributions; Continuous distributions; Poisson process; Empirical distributions.

3. QUEUING MODELS, RANDOM-NUMBER (8 HRS)

QUEUING MODEL: Characteristics of queuing systems; Queuing notation; Long-run measures of performance of queuing systems; Steady-state behavior of M/G/1 queue; Networks of queues. Properties of random numbers; Generation of pseudo-random numbers; Techniques for generating random numbers; Tests for Random Numbers.

4. ANALYSIS OF SIMULATION DATA (8 HRS)

Input Modeling : Collection; Identifying the distribution with data; Parameter estimation; Goodness of Fit Tests; Fitting a non-stationary Poisson process; selecting input models without data; Multivariate and Time-Series input models, Variance reduction. Verification and Validation, Optimization Variance reduction techniques; Model building, verification and validation; Verification of simulation models; Calibration and validation of models. Optimization via Simulation, OUTPUT.

5. APPLICATION, SIMULATION OF COMPUTER SYSTEM AND COMPUTER NETWORK (8 HRS)

Case studies of the simulation of manufacturing and material-Handling Systems, Simulation of computer Systems: Introduction, simulation Tools, Model Input, high level computer-system simulation, CPU simulation, Memory simulation, Simulation of

Draft Copy

Computer Networks: Introduction, Traffic Modeling, Media Access control, Data Link Layer, TCP, Model construction.

TEXT BOOKS:

1. Jerry Banks, John S. Carson II, Barry L. Nelson, David M. Nicol: "*Discrete-Event System Simulation*", 4th Edition, Pearson Education, 2007.

REFERENCES:

1. Lawrence M. Leemis, Stephen K. Park: "Discrete – Event Simulation: A First Course", Pearson / Prentice-Hall, 2006.
2. Averill M. "*Law: Simulation Modeling and Analysis*", 4th Edition, Tata McGraw-Hill, 2007.
3. Ian F. Akyildiz, Jiang Xie and Shantidev Mohanty, "*A Survey of mobility Management in Next generation All IP- Based Wireless Systems*", IEEE Wireless Communications Aug.2004, pp 16-27.

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CSIT106 – UNP LAB.

Teaching Scheme:

Practical - 4 Hrs/Week

Examination Scheme:

Termwork - 50 Marks

It shall consist of a minimum of 8 experiments based on the syllabus of Unix Network Programming.

CSIT107 – DATA MINING LAB

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Teaching Scheme:
Practical - 2 Hrs/Week

Examination Scheme:
Practical - 50 Marks

It shall consist of a minimum of 8 experiments based on the syllabus of Data Mining.

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CSIT108 - SEMINAR

Teaching Scheme:

Practical - 2 Hrs/Week

Examination Scheme:

Practical - 50 Marks

The Seminar will consist of a typewritten report covering the topic selected for the seminar. The candidate shall deliver the seminar on the topic which will be judged by two examiners and the marks will be given accordingly.

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SEMESTER-II
CSIT201- DISTRIBUTED DATABASES

Teaching Scheme:

Lecture - 03 Hrs.

Tutorial - 01 Hrs.

Examination Scheme:

Theory Paper - 80 Marks

Class Test - 20 Marks

1. UNIT I**(8 HRS)**

Features of Distributed versus Centralized Databases Principles of Distributed Databases, Levels Of Distribution Transparency, Reference Architecture for Distributed Databases, Types of Data Fragmentation, Integrity Constraints in Distributed Databases, Distributed Database Design.

2. UNIT II**(8 HRS)**

Translation of Global Queries to Fragment Queries Equivalence transformations for Queries, Transforming Global Queries into Fragment Queries, Distributed Grouping and Aggregate Function Evaluation, Parametric Queries.

3. UNIT III**(8 HRS)**

Optimization of Access Strategies, A Framework for Query Optimization, Join Queries, The Management of Distributed Transactions A Framework for Transaction Management, Supporting Atomicity of Distributed Transactions.

4. UNIT IV**(8 HRS)**

Concurrency Control for Distributed Transactions Distributed Deadlocks, Reliability, Basic Concepts, Non blocking Commitment Protocols, Reliability and concurrency Control.

5. UNIT V**(8 HRS)**

Detection and Resolution of Inconsistency, Checkpoints and Cold Restart, Distributed Database Administration, Catalog Management in Distributed Databases, Authorization and Protection.

TEXT BOOKS:

1. Distributed Databases Principles & Systems, Stefano Ceri, Giuseppe Pelagatti, TMH.
2. Principles of Distributed Database Systems, M. Tamer Ozsu, Patrick Valduriez, Pearson Education, 2nd Edition.

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REFERENCES:

1. E.R.Harold, "Java *Network Programming*", 2nd edition, O'Reilly, SPD.
2. G.Coulouris, J.Dollimore and Tim Kindbirg, "*Distributed Systems, Concepts and Design*", 3rd edition, Pearson Education.

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CSIT202 - INFORMATION AND NETWORK SECURITY

Teaching Scheme:

Lecture - 03 Hrs

Tutorial - 01 Hrs

Examination Scheme:

Theory Paper - 80 Marks

Class Test - 20 Marks

1. INTRODUCTION TO INFORMATION SECURITY (8 HRS)

Introduction; What is security? Critical characteristics of information; NSTISSC security model; Approaches to information security implementation; Information security terminologies.

Introduction to Network Security: Attacks, Services, and Mechanisms; Security Attacks; Security Services; A model for Internetwork Security; Internet Standards and RFCs.

2. SECURITY TECHNOLOGY (8 HRS)

Firewalls and VPNs: Introduction, Physical design, Firewalls, Protecting Remote Connections. Intrusion Detection, Access control and Other Security Tools: Introduction; Intrusion Detection Systems (IDS); Honey Pots, Honey Nets, and Padded cell systems; Scanning and Analysis Tools; Access Control Devices, Information Security maintenance Introduction; Security Management Models; the Maintenance Model.

3. CRYPTOGRAPHY (8 HRS)

Conventional Encryption Principles and Algorithms (DES, AES, RC4); Cipher Block Modes of Operation; Location of encryption devices; Key distribution Public Key Cryptography Principles and Algorithms (RSA, RABIN, ELGAMAL, Diffie-Hellman, ECC), Key management. Approaches to message authentication; Secure Hash functions (SHA-512, WHIRLPOOL) and HMAC .

4. AUTHENTICATION APPLICATIONS (8 HRS)

Digital Signatures: Comparison, Process- Need for Keys, Signing the Digest, Services, Attacks on Digital Signatures. Kerberos, X.509 Directory Authentication Service Electronic Mail Security Pretty Good Privacy (PGP), S/MIME

5. IP SECURITY (8 HRS)

IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations, Key Management Web Security Web security requirements, Secure Socket Layer (SSL) and Transport Layer Security (TLS), Secure Electronic Transaction (SET), Network Management Security.

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Basic concepts of SNMP, SNMPv1 community facility, SNMPv3, Intruders, Intrusion Detection Systems, Viruses and related threats, Virus Countermeasures.

TEXT BOOKS:

1. William Stallings: "*Network Security Essentials Applications and Standards*", Person Education, 2000.
2. Behrouz A. Forouzan: "*Cryptography and Network Security*", Tata McGraw-Hill, 2007.

REFERENCES:

1. Michael E. Whitman and Herbert J. Mattord: "*Principles of Information Security*", 2nd Edition, Thomson, 2005.
2. William Stallings, "*Cryptography and Network Security*", Fourth Edition, Pearson Education 2007.

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CSIT203 - ADVANCED COMPILER DESIGN AND IMPLEMENTATION

Teaching Scheme:

Lecture - 03 Hrs.

Tutorial - 01 Hrs.

Examination Scheme:

Theory Paper - 80 Marks

Class Test - 20 Marks

1. INTRODUCTION (8 HRS)

The structure of a Compilers; Lexical analysis: The Role of Lexical Analyzer; Input Buffering; Specifications of Tokens; Recognition of Tokens. Syntax Analysis :Introduction; Context-free Grammars; Writing a Grammar; Top-down Parsing; Bottom-up Parsing; Introduction to LR Parsing: Simple LR. More powerful LR parsers; using ambiguous grammars; Parser Generators.

2. SYNTAX-DIRECTED TRANSLATION (8 HRS)

Syntax-Directed definitions; Evaluation order for SDDs; Applications of Syntax-directed translation; Syntax-directed translation schemes.

3. INFORMAL COMPILER ALGORITHM NOTATION(ICAN) (8 HRS)

Extended Backus-Naur Form syntax notation, Introduction to ICAN, a quick overview of ICAN, Whole programs, Type definitions, declarations, Data type and expressions, statements, wrap-up, ICAN naming of data structures and routines that manipulate intermediate code.

4. INTERMEDIATE CODE GENERATION (8 HRS)

Variants of syntax trees; Three-address code; Types and declarations; Translation of expressions; Type checking; Control flow; Back patching; Switch statements; Intermediate code for procedures.

Run-Time Environments: Storage Organization; Stack allocation of space; Access to non-local data on the stack; Heap management; Introduction to garbage collection.

5. CODE GENERATION AND INSTRUCTION SELECTION (8 HRS)

Issues in the design of Code Generator; The Target language; Addresses in the target code; Basic blocks and Flow graphs; Optimization of basic blocks; A Simple Code Generator. dag representation of programs, code generation from dags, peep hole optimization.

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TEXT BOOKS:

1. Alfred V. Aho, Monica S. Lam, Ravi Sethi, Jeffrey D Ullman: "*Compilers- Principles, Techniques and Tools*", 2nd Edition, Addison-Wesley, 2007.
2. Steven.S.Muchnick, "*Advanced Compiler Design Implementation*", Morgan Kauffman publishers.

REFERENCES:

1. Charles N. Fischer, Richard J. leBlanc, Jr.: "*Crafting a Compiler with C*", Pearson Education, 1991.
2. Andrew W Apple: "*Modern Compiler Implementation in C*", Cambridge University Press, 1997.
3. Kenneth C Loudon: "*Compiler Construction Principles & Practice*", Thomson Education, 1997.

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CSIT204 - SOFT COMPUTING

Teaching Scheme:

Lecture - 03 Hrs.

Tutorial - 01 Hrs.

Examination Scheme:

Theory Paper - 80 Marks

Class Test - 20 Marks

1. EVOLUTIONARY COMPUTING**(8 HRS)**

What is Soft computing? Necessity of Soft computing, Major Areas of Soft Computing, Applications. Basic Concepts of Genetic Algorithms (GA), Working Principle, Encoding methods, Fitness function, GA Operators- Reproduction; Crossover; Mutation, Convergence of GA, Multi-level Optimization, Real Life Problems.

2. FUZZY SYSTEMS**(8 HRS)**

Fuzzy Set theory, Fuzzy Relation, Fuzzification, Minmax Composition, Defuzzification, Fuzzy Logic, Fuzzy Rule based systems,

3. NEURAL NETWORK**(8 HRS)**

Basic Concept of Neural Network, Overview of Learning rules and activation functions, Single layer Perceptrons and Learning, Back Propagation networks- Architecture of Backpropagation(BP) Networks; Backpropagation Learning; Variation of Standard Backpropagation Neural Network,

4. HYBRID SYSTEMS**(8 HRS)**

Sequential Hybrid Systems, Auxiliary Hybrid Systems, Embedded Hybrid Systems, Neuro- Fuzzy Hybrid Systems, Neuro-Genetic Hybrid Systems, Fuzzy-Genetic Hybrid Systems. Genetic Algorithm (GA) based Back propagation Networks, GA based weight determination, Fitness function, Reproduction, Convergence,

5. FUZZY LOGIC BASED NEURAL NETWORK MODELS**(8 HRS)**

Fuzzy Backpropagation (BP) Networks, Fuzzy Neurons Fuzzy BP architecture, Learning in Fuzzy BP, Inference by Fuzzy BP, Fuzzy ARTMAP, Fuzzy Associative Memories.

TEXT BOOKS:

1. S. Rajasekaran, G. A. Vijayalakshami, "*Neural Networks, Fuzzy Logic and Genetic Algorithms: Synthesis & Applications*", PHI.

REFERENCES:

1. Chin Teng Lin, C. S. George Lee, "*Neuro-Fuzzy Systems*", PHI
2. Tomthy Ross, "*Fuzzy Logic and Engineering Application*", TMH
3. Kishan Mehrotra, "*Elements of Artificial Neural Network*".
4. E. Goldberg, "*Genetic Algorithms: Search and Optimization*".

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CSIT205 - EL-II ADVANCED ALGORITHM

Teaching Scheme:

Lecture - 03 Hrs.

Tutorial - 01 Hrs.

Examination Scheme:

Theory Paper - 80 Marks

Class Test - 20 Marks

1. BASIC CONCEPTS (REVIEW)**(8 HRS)**

Abstract Data Types, Data structures, Algorithms- Characteristics Of Algorithms, Performance analysis- Time complexity and Space complexity, Asymptotic Analysis-Big O, Omega and Theta notations. ADT, Static and Dynamic Implementation of Linear Data Structures: Stack, Queue, Circular Queue, Stack ADT, Queue ADT, Non Linear data structures-Trees-Basic Terminology, Binary tree ADT, array and linked representations, Recursive traversals, threaded binary trees, Applications- Huffman coding,

2. SEARCH TREES**(8 HRS)**

Binary Search Tree ADT, Implementation, Operations- Searching, Insertion and Deletion, Balanced Search trees-AVL Trees, Operations – Insertion and Searching-Trees, B-Tree of order m, Operations- Insertion, Deletion and Searching, Introduction to Red-Black Trees, Splay Trees*-Trees, B+-Trees(Elementary treatment), Comparison of Search Trees. Linear Search, Binary Search, Hashing-Hash functions, Collision-Handling schemes, Dictionary ADT, Linear list representation, Skip list representation, Hash table representation, Comparison of Searching methods.

3. GRAPHS AND SORTING**(8 HRS)**

Basic Terminology, Graph Representations- Adjacency matrix, Adjacency lists, Adjacency multilists, Graph traversals- DFS and BFS, Spanning trees-Minimum cost spanning trees, Kruskal's Algorithm for Minimum cost Spanning trees, Shortest paths-Single Source Shortest Path Problem, All Pairs Shortest Path Problem. Sorting- Bubble Sort, Insertion Sort, Shell sort, HeapSort, RadixSort, Quicksort, Merge sort, Comparison of Sorting methods.

4. UNIT IV**(8 HRS)**

Greedy Method: Knapsack problem, Tree vertex splitting, Job sequencing with deadlines, optimal storage on tapes. Dynamic Programming: Multistage graph, Optimal Binary Search Tree, String editing, 0/1 Knapsack problem, Reliability design, Traveling salesperson problem Backtracking: 8-queens problem, sum of subset, graph coloring. Lower Bound Theory: Comparison Trees, techniques for algebraic problems.

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(8 HRS)

5. UNIT V

NP-Hard & NP-Complete Problems: Basic concept, Cook's Theorem, NP-Hard graph problems, NP-Hard Scheduling problems, NP-Hard code generation problems. PRAM Algorithms: Computational Model, Fundamental techniques & algorithms, Selection, Merging, Sorting Lower bounds. Mesh Algorithms: Computational Model, Packet routing, Fundamental algorithms, Merging, Sorting.

TEXT BOOKS:

1. Yedidyah Langsam, Moshe J. Augenstein, Aaron M. Tenenbaum, "*Data Structures using C & C++*", Pearson Pub.
2. Yeshwant Kanetkar, "*Data structures through C*", BPB Pub
3. Rober L. Kruse, "*Data Structures and Program Design*", PHI Pub
4. Ellis Horowitz, Sartaj Sahni and Sanguthewar Rajsekarán, "*Fundamentals of Computer Algorithms*", Galgotia Pub.

REFERENCES:

1. Thomas H. Cormen, Charles S. Leiserson, Ronald, L. Rivest and Clifford Stein, "Introduction to Algorithm", PHI Pub (2nd Edition)
2. Robert Lafore, "Data Structures and Algorithms in Java", Pearson Education.
3. W.H.Ford and W.R.Topp, "Data Structures with Java", Pearson Education.

Draft Copy

CSIT205 - EL-II STORAGE AREA NETWORKS

Teaching Scheme:

Lecture - 03 Hrs.

Tutorial - 01 Hrs.

Examination Scheme:

Theory Paper - 80 Marks

Class Test - 20 Marks

1. UNIT I**(8 HRS)**

Introduction – Storage and networking concepts – SCSI bus architecture – Networking in front of the server – Networking behind the server – Network -attached Storage – Fibre channel internals – Layers – Data encoding – Framing protocol – class of service – flow control – Name and addressing conventions.

2. UNIT II**(8 HRS)**

SAN topologies – Point-to Point – Arbitrated Loop – Loop Addressing-Loop Initialization-Port Login-Loop port state machine – Design considerations for Arbitrated Loop – Fabrics – Fabric login – Simple Name Server – State Change Notification – Private Loop Support – Fabric Zoning – Building Extended SANs.

3. UNIT III**(8 HRS)**

Fibre Channel Products – Gigabit Interface Converters (GBICs) – host Bus Adapters – Fibre channel RAID – Fibre channel JBODs – Arbitrated Loop Hubs – hub Architecture – Unmanaged Hubs – Managed Hubs – Switching Hubs – Fabric Switches – Fibre Channel-to-SCSI Bridges – SAN software Products – Problem isolation in SANs – Isolation Techniques – Fibre channel Analyzers.

4. UNIT IV**(8 HRS)**

Management Studies – Storage Network Management – In-Band management – Out-of-Band Management-SNMP-HTTP-TELNET – Storage Network Management Issues – Storage Resource Management – Storage Management – Storage, Systems, and Enterprise Management Integration.

5. UNIT V**(8 HRS)**

Application Studies – Full-motion video – LAN free and Server free Tape Backup – server clustering – Internet Service Providers – Campus storage networks – Disaster recovery.

TEXT BOOKS:

1. Tom Clark, “*Designing Storage Area Networks*”, Addison-Wesley Professional, 1st edition, 1999.
2. Alex Goldman, “*Storage Area Networks Fundamentals*”, Cisco Press 2002.

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CSIT205 - EL-II ADHOC AND SENSOR NETWORK

Teaching Scheme:

Lecture - 03 Hrs.

Tutorial - 01 Hrs.

Examination Scheme:

Theory Paper - 80 Marks

Class Test - 20 Marks

1. AD-HOC MAC (8 HRS)

Introduction – Issues in Ad-Hoc Wireless Networks. MAC Protocols – Issues, Classifications of MAC protocols, Multi channel MAC & Power control MAC protocol.

2. AD-HOC NETWORK ROUTING & TCP (8 HRS)

Issues – Classifications of routing protocols – Hierarchical and Power aware. Multicast routing – Classifications, Tree based, Mesh based. Ad Hoc Transport Layer Issues. TCP Over Ad Hoc – Feedback based, TCP with explicit link, TCP-BuS, Ad Hoc TCP, and Split TCP.

3. WSN –MAC (8 HRS)

Introduction – Sensor Network Architecture, Data dissemination, Gathering. MAC Protocols – self-organizing, Hybrid TDMA/FDMA and CSMA based MAC.

4. WSN ROUTING, LOCALIZATION & QOS (8 HRS)

Issues in WSN routing – OLSR, AODV. Localization – Indoor and Sensor Network Localization. QoS in WSN.

5. MESH NETWORKS (8 HRS)

Necessity for Mesh Networks – MAC enhancements – IEEE 802.11s Architecture – Opportunistic routing – Self configuration and Auto configuration – Capacity Models – Fairness – Heterogeneous Mesh Networks – Vehicular Mesh Networks.

TEXT BOOKS:

1. C. Siva Ram Murthy and B.Smanoj, “*Ad Hoc Wireless Networks – Architectures and Protocols*”, Pearson Education, 2004.
2. Feng Zhao and Leonidas Guibas, “*Wireless Sensor Networks*”, Morgan Kaufman Publishers, 2004.
3. C.K.Toh, “*Ad Hoc Mobile Wireless Networks*”, Pearson Education, 2002.
4. Thomas Krag and Sebastin Buettrich, “*Wireless Mesh Networking*”, O’Reilly Publishers, 2007.

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CSIT206 – SOFT COMPUTING LAB

Teaching Scheme:

Practical - 4 Hrs/Week

Examination Scheme:

Termwork - 50 Marks

It shall consist of a minimum of 8 experiments based on the syllabus of Soft Computing.

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CSIT207 – COMPILER DESIGN LAB.

Teaching Scheme:

Practical - 2 Hrs/Week

Examination Scheme:

Practical - 50 Marks

It shall consist of a minimum of 8 experiments based on the syllabus of Compiler Design.

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CSIT208 - MINI PROJECT

Teaching Scheme:

Practical -2 Hrs/Week

Examination Scheme:

Practical - 50 Marks

The student will have to make a literature survey and should select a small project (as suggested by faculty adviser) relevant to Computer Science and Information Technology. The candidate should submit a comprehensive report on the work done and should deliver a seminar at the end of the semester which will be judged by two examiners and the marks will be given accordingly.

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SEMESTER-III
CSIT301 - DISSERTATION (PART - I)

Teaching Scheme

Practical - 12 Hrs/Week.

Examination Scheme:

Practical - 50 Marks

The dissertation Seminar will consist of a type written report covering the topic selected for Dissertation report. This should include the literature survey, technical details and related data required for the dissertation. The candidate shall deliver the dissertation seminar on the topic which will be judged by two examiners (one external and one internal guide) and the marks will be given accordingly.

SEMESTER-IV
CSIT401 - DISSERTATION (PART - II)

Teaching Scheme

Practical - 20 Hrs/Week.

Examination Scheme:

Termwork - 50 Marks

Practical - 200 Marks

The practical Examination will consist of a presentation along with the demonstration of the dissertation work. The said examination will be conducted by a panel of two examiners (one internal guide and one external examiner).