



# **HINDUSTAN UNIVERSITY**

HINDUSTAN INSTITUTE OF TECHNOLOGY & SCIENCE

(Estd. u/s 3 of the UGC Act, 1956)

Padur, Kancheepuram District - 603 103.

**DEPARTMENT OF  
COMPUTER SCIENCE AND ENGINEERING**

**CURRICULUM  
&  
SYLLABUS 2013-14**

**B.Tech.  
(COMPUTER SCIENCE AND ENGINEERING)**



**ACADEMIC REGULATIONS (B.Tech)**  
**(Full /Part Time) (Effective 2013-14)**

**1. Vision, Mission and Objectives**

**1.1** The Vision of the Institute is "To make every man a success and no man a failure".

In order to progress towards the vision, the Institute has identified itself with a mission to provide every individual with a conducive environment suitable to achieve his / her career goals, with a strong emphasis on personality development, and to offer quality education in all spheres of engineering, technology, applied sciences and management, without compromising on the quality and code of ethics.

**1.2 Further, the Institute always strives**

- To train our students with the latest and the best in the rapidly changing fields of Engineering, Technology, Management, Science & Humanities.
- To develop the students with a global outlook possessing, state of the art skills, capable of taking up challenging responsibilities in the respective fields.
- To mould our students as citizens with moral, ethical and social values so as to fulfill their obligations to the nation and the society.
- To promote research in the field of Science, Humanities, Engineering, Technology and allied branches.

**1.3** Aims and Objectives of the Institute are focused on

- Providing world class education in engineering, technology, applied sciences and management.
- Keeping pace with the ever changing technological scenario to help the

students to gain proper direction to emerge as competent professionals fully aware of their commitment to the society and nation.

- To inculcate a flair for research, development and entrepreneurship.

**2. Admission**

**2.1** The admission policy and procedure shall be decided from time to time by the Board of Management (BOM) of the Institute, following guidelines issued by Ministry of Human Resource Development (MHRD), Government of India. The number of seats in each branch of the B.Tech programme will be decided by BOM as per the directives from MHRD, Government of India and taking into account the market demands. Some seats for Non Resident Indians and a few seats for foreign nationals shall be made available.

**2.2 (i) Full-Time :**

At the time of applying for admission, the candidates should have passed / appeared and be awaiting results of the final examination of the 10+2 system or its equivalent with Mathematics, Physics and Chemistry as subjects of study.

**(ii) Part -Time:**

At the time of applying for admission, the candidates should have a Diploma in Engineering/Technology in the relevant branch of specialization awarded by the State Board of Technical Education, Tamil Nadu or any other authority accepted by the Board of Management of the University as equivalent thereto and a minimum of one year practical experience.

**2.3** The selected candidates will be admitted to the B.Tech. programme after he/she fulfills all the admission requirements set by the Institute and after the payment of the prescribed fees.

**2.4** In all matters relating to admission to the B.E. / B.Tech. programme, the decision of the Institute and its interpretation given by the Chancellor of the Institute shall be final.

**2.5** If at any time after admission, it is found that a candidate has not fulfilled any of the requirements stipulated by the Institute, the Institute may revoke the admission of the candidate with information to the Academic Council.

### **3. Structure of the programme**

**3.1** The programme of instruction will have the following structure:

- i) A general (common) core programme comprising basic sciences, engineering sciences, humanities, technical arts and mathematics.
- ii) An engineering core programme introducing the student to the foundations of engineering in the respective branch.
- iii) An elective programme enabling the student to opt and undergo a set of courses of interest to him/ her.
- iv) Professional practice including project, seminar and industrial training.
- v) General elective courses, such as, Environmental Studies, Physical Education, Professional ethics, and National Service Scheme.

The distribution of total credits required for the degree programme into the above five categories will nominally be 20%, 50%, 15%, 5%, and 10% respectively.

#### **3.2 (i) Full-Time:**

The duration of the programme will be a minimum of 8 semesters. Every branch of the B.E. / B.Tech. programme will have a curriculum and syllabi for the courses approved by the Academic Council.

#### **ii) Part - Time:**

The duration of the programme will be a minimum of 7 semesters. Every branch of the B.Tech. programme will have a curriculum and syllabi for the courses approved by the Academic Council

**3.3** The academic programmes of the Institute follow the credit system. The general pattern is:

- One credit for each lecture hour per week per semester;
- One credit for each tutorial hour per week per semester;
- Two credits for each laboratory practical/ drawing of three hours per week per semester.
- One credit for 4 weeks of industrial training and
- One credit for 4 hours of project per week per semester

#### **3.4 (i) Full-Time:**

For the award of degree, a student has to earn certain minimum total number of credits specified in the curriculum of the relevant branch of study. The curriculum of the different programs shall be so designed that the minimum prescribed credits required for the award of the degree shall be within the limits of 190-200.

#### **(ii) Part-Time:**

For the award of degree, a student has to earn certain minimum total number of credits specified in the curriculum of the

relevant branch of study. The curriculum of the different programs shall be so designed that the minimum prescribed credits required for the award of the degree shall be within the limits of 110-120.

**3.5** The medium of instruction, examination and the language of the project reports will be English.

**4. Faculty Advisor**

**4.1** To help the students in planning their courses of study and for getting general advice on the academic programme, the concerned Department will assign a certain number of students to a Faculty member who will be called their Faculty Advisor.

**5. Class Committee**

**5.1** A Class Committee consisting of the following will be constituted by the Head of the Department for each class:

- (i) A Chairman, who is not teaching the class.
- (ii) All subject teachers of the class.
- (iii) Two students nominated by the department in consultation with the class.

The Class Committee will meet as often as necessary, but not less than three times during a semester.

**The functions of the Class Committee will include:**

- (i) Addressing problems experienced by students in the classroom and the laboratories.
- (ii) Analyzing the performance of the students of the class after each test and finding ways and means of addressing problems, if any.

- (iii) During the meetings, the student members shall express the opinions and suggestions of the class students to improve the teaching / learning process.

**6. Grading**

**6.1** A grading system as below will be adhered to.

Range of Marks	Letter Grade	Grade points
95 -100	S	10
85 - 94	A	09
75 - 84	B	08
65 -74	C	07
55 - 64	D	06
50 - 54	E	05
< 50	U	00
	I (Incomplete)	-

**6.2 GPA and CGPA**

GPA is the ratio of the sum of the product of the number of credits  $C_i$  of course "i" and the grade points  $P_i$  earned for that course taken over all courses "i" registered by the student to the sum of  $C_i$  for all "i". That is,

$$GPA = \frac{\sum_i C_i P_i}{\sum_i C_i}$$

CGPA will be calculated in a similar manner, at any semester, considering all the courses enrolled from the first semester onwards.

**6.3** For the students with letter grade I in certain subjects, the same will not be included in the computation of GPA and CGPA until after those grades are converted to the regular grades.

**6.4** Raw marks will be moderated by a moderation board appointed by the Vice-Chancellor of the University. The final marks will be graded using an absolute grading system. The Constitution and composition of the moderation board will be dealt with separately.

## **7. Registration and Enrolment**

**7.1** Except for the first semester, registration and enrollment will be done in the beginning of the semester as per the schedule announced by the University.

**7.2** A student will be eligible for enrollment only if he/she satisfies regulation 10 (maximum duration of the programme) and will be permitted to enroll if (i) he/she has cleared all dues in the Institute, Hostel and Library up to the end of the previous semester and (ii) he/she is not debarred from enrollment by a disciplinary action of the University.

**7.3** Students are required to submit registration form duly filled in.

## **8. Registration requirement**

### **8.1 (i) Full -Time:**

A full time student shall not register for less than 16 credits or more than 30 credits in any given semester.

### **(ii) Part -Time:**

A part time student shall not register for less than 10 credits or more than 20 credits in any given semester

**8.2** If a student finds his/her load heavy in any semester, or for any other valid reason, he/she may withdraw from the courses within three weeks of the commencement of the semester with the written approval of his/her Faculty Advisor and HOD. However the student should ensure that the total number of credits

registered for in any semester should enable him/her to earn the minimum number of credits per semester for the completed semesters.

## **9. Continuation of the programme**

**9.1** For those students who have not earned the minimum required credit prescribed for that particular semester examination, a warning letter to the concerned student and also to his/her parents regarding the shortage of his/her credit will be sent by the HOD after the announcement of the results of the university examinations.

## **10. Maximum duration of the programme**

### **10.1 (i) Full - Time**

The normal duration of the programme is eight semesters. However a student may complete the programme at a slower pace by taking more time, but in any case not more than 14 semesters excluding the semesters withdrawn on medical grounds or other valid reasons.

### **(ii) Part - Time**

The normal duration of the programme is seven semesters. However a student may complete the programme at a slower pace by taking more time, but in any case not more than 12 semesters excluding the semesters withdrawn on medical grounds or other valid reasons

## **11. Temporary discontinuation**

**11.1** A student may be permitted by the Director (Academic) to discontinue temporarily from the programme for a semester or a longer period for reasons of ill health or other valid reasons. Normally a student will be permitted to discontinue from the programme only for a maximum duration of two semesters.

## **12. Discipline**

**12.1** Every student is required to observe

discipline and decorum both inside and outside the campus and not to indulge in any activity which will tend to bring down the prestige of the University.

**12.2** Any act of indiscipline of a student reported to the Director (Academic) will be referred to a Discipline Committee so constituted. The Committee will enquire into the charges and decide on a suitable punishment if the charges are substantiated. The committee will also authorize the Director (Academic) to recommend to the Vice-Chancellor the implementation of the decision. The student concerned may appeal to the Vice-Chancellor whose decision will be final. The Director (Academic) will report the action taken at the next meeting of the Council.

**12.3** Ragging and harassment of women are strictly prohibited in the University campus and hostels.

### **13. Attendance**

**13.1** A student whose attendance is less than 75% in a semester is not eligible to appear for the end-semester examination for that semester. The details of all students who have less than 75% attendance in a course will be announced by the teacher in the class. These details will be sent to the concerned HODs and Director (Academic).

**13.2** Those who have less than 75% attendance will be considered for condonation of shortage of attendance. However, a condonation of 10% in attendance will be given on medical reasons. Application for condonation recommended by the Faculty Advisor, concerned faculty member and the HOD is to be submitted to the Director (Academic) who, depending on the merits of the case, may permit the student to appear for the end semester

examination. A student will be eligible for this concession at most in two semesters during the entire degree programme. Application for medical leave, supported by medical certificate with endorsement by a Registered Medical Officer, should reach the HOD within seven days after returning from leave or, on or before the last instructional day of the semester, whichever is earlier.

**13.3** As an incentive to those students who are involved in extra curricular activities such as representing the University in Sports and Games, Cultural Festivals, and Technical Festivals, NCC/ NSS events, a relaxation of up to 10% attendance will be given subject to the condition that these students take prior approval from the officer - in-charge. All such applications should be recommended by the concerned HOD and forwarded to Director (Academic) within seven instructional days after the programme / activity.

### **14. Assessment Procedure**

**14.1** The Academic Council will decide from time to time the system of tests and examinations in each subject in each semester.

**14.2** For each theory course, the assessment will be done on a continuous basis as follows:

Test / Exam	Weightage	Duration of Test / Exam
First Periodical Test *	10%	2 Periods
Second Periodical Test *	10%	2 Periods
Model Exam	20%	3 hours
Seminar/Assignments/Quiz	10%	-
Attendance	10%	
End - semester examination	50%	3 Hours

\*Best out of the two tests will be considered.

**14.3** For practical courses, the assessment will be done by the subject teachers as below:

- (i) Weekly assignment/Observation note book / lab records - weightage 60%.
- (ii) End semester examination of 3 hours duration including viva - weightage 40%.

**14.4** For courses on Physical Education, NSS, etc the assessment will be as satisfactory/not satisfactory only.

**15. Make up Examination/Model Exam**

**15.1** Students who miss the end-semester examinations / model examination for valid reasons are eligible for make-up examination /model examination. Those who miss the end-semester examination / model examination should apply to the Head of the Department concerned within five days after he / she missed examination, giving reasons for absence.

**15.2** Permission to appear for make-up examination / model examination will be given under exceptional circumstances such as admission to a hospital due to illness. Students should produce a medical certificate issued by a Registered Medical Practitioner certifying that he/she was admitted to hospital during the period of examination / model exam and the same should be duly endorsed by parent / guardian and also by a medical officer of the University within 5 days.

**16. Project evaluation**

**16.1** For Project work, the assessment will be done on a continuous basis as follows:

Review / Examination	Weightage
First Review	10%
Second Review	20%
Third Review	20%
End-semester Examination	50%

For end-semester examination, the student will submit a Project Report in a format specified by the Director (Academic). The first three reviews will be conducted by a Committee constituted by the Head of the Department. The end-semester examination will be conducted by a Committee constituted by the Registrar / Controller of examination. This will include an external expert.

**17. Declaration of results**

**17.1** A candidate who secures not less than 50% of total marks prescribed for a course with a minimum of 50% of the marks prescribed for the end semester examination shall be declared to have passed the course and earned the specified credits for the course.

(ii) To be Eligible to appear for the end semester examinations for a particular course, a candidate will have to secure a minimum of 40% marks in the sessional for that course.

(iii) Candidates are required to obtain all credits assigned to the first two semesters of the programme within the first four semesters of the programme. Candidates failing to satisfy this requirement will not be allowed to proceed to the fifth semester until the condition is satisfied. Further, candidates will not be allowed to proceed to seventh



semester if they have not cleared all the courses assigned during third & fourth semesters.

- 17.2** After the valuation of the answer scripts, the tabulated results are to be scrutinized by the Result Passing Boards of UG programmes constituted by the Vice-Chancellor. The recommendations of the Result Passing Boards will be placed before the Standing Sub Committee of the Academic Council constituted by the Chancellor for scrutiny. The minutes of the Standing Sub Committee along with the results are to be placed before the Vice-Chancellor for approval. After getting the approval of the Vice-Chancellor, the results will be published by the Controller of Examination/Registrar.
- 17.3** If a candidate fails to secure a pass in a course due to not satisfying the minimum requirement in the end-semester examination, he/she shall register and re-appear for the end-semester examination during the following semester. However, the sessional marks secured by the candidate will be retained for all such attempts.
- 17.4** If a candidate fails to secure a pass in a course due to insufficient sessional marks though meeting the minimum requirements of the end-semester examination, and wishes to improve on his/her sessional marks, he/she will have to register for the particular course and attend the course with permission of the HOD concerned and Director(Academic) with a copy marked to the Registrar. The sessional and external marks obtained by the candidate in this case will replace the earlier result.

**17.5** A candidate can apply for the revaluation of his/her end-semester examination answer paper in a theory course within 2 weeks from the declaration of the results, on payment of a prescribed fee through proper application to the Registrar/Controller of Examinations through the Head of the Department. The Registrar/Controller of Examination will arrange for the revaluation and the results will be intimated to the candidate concerned through the Head of the Department. Revaluation is not permitted for practical courses and for project work.

**17.6** After ten semesters, the sessional marks of the candidate will not be considered for a pass in a course. A candidate who secures 50% in the end semester examination shall be declared to have passed the course and earned the specified credits for the course.

## **18. Grade Card**

**18.1** After results are declared, grade sheet will be issued to each student which will contain the following details:

- (i) Program and branch for which the student has enrolled.
- (ii) Semester of registration.
- (iii) List of courses registered during the semester and the grade scored.
- (iv) Semester Grade Point Average (GPA)
- (v) Cumulative Grade Point Average (CGPA).

## **19. Class/Division**

**19.1 Classification is based on CGPA and is as follows:**

$CGPA \geq 8.0$ : **First Class with distinction**

$6.5 \leq CGPA < 8.0$  : **First Class**

$5.0 \leq CGPA < 6.5$  : **Second Class.**

- 19.2** (i) Further, the award of 'First class with distinction' is subject to the candidate becoming eligible for the award of the degree having passed the examination in all the courses in his/her first appearance within the minimum duration of the programme.
- (ii) The award of 'First Class' is further subject to the candidate becoming eligible for the award of the degree having passed the examination in all the courses **within 10 semesters**.
- (iii) The period of authorized discontinuation of the programme (vide clause 11.1) will not be counted for the purpose of the above classification.

**20. Transfer of credits**

- 20.1.** Within the broad framework of these regulations, the Academic Council, based on the recommendation of the transfer of credits committee so consulted by the Chancellor may permit students to earn part of the credit requirement in other approved institutions of repute and status in the country or abroad.
- 20.2** The Academic Council may also approve admission of lateral entry (who hold a diploma in Engineering/ technology) candidates with advance credit based on the recommendation of the transfer of credits committee on a case to case basis.

**21. Eligibility for the award of B.Tech. Degree**

- 21.1.** A student will be declared to be eligible for the award of the B.Tech. Degree if he/she has

- i) registered and successfully acquired the credits for the core courses;
- ii) successfully acquired the credits in the different categories as specified in the curriculum corresponding to the discipline (branch) of his/her study within the stipulated time;
- iii) has no dues to all sections of the Institute including Hostels, and
- iv) has no disciplinary action pending against him/her.

The award of the degree must be recommended by the Academic Council and approved by the Board of Management of the University.

**22. Change of Branch**

- 22.1** If the number of students in any branch of B.Tech. class as on the last instructional day of the First Semester is less than the sanctioned strength, then the vacancies in the said branches can be filled by transferring students from other branches. All such transfers will be allowed on the basis of merit of the students. The decision of the Chancellor shall be final while considering such requests.
- 22.2** All students who have successfully completed the first semester of the course will be eligible for consideration for change of branch subject to the availability of vacancies.

**23. Power to modify**

- 23.1.** Notwithstanding all that has been stated above, the Academic Council shall modify any of the above regulations from time to time subject to approval by the Board of Management.

**HINDUSTAN UNIVERSITY**  
**HINDUSTAN INSTITUTE OF TECHNOLOGY AND SCIENCE**  
**COMPUTER SCIENCE AND ENGINEERING**

**PROGRAMME EDUCATIONAL OBJECTIVES**

1. To develop highly competent Engineering Graduates in Computer Science and Engineering who are able to spearhead related ICT industries.
2. To encourage the Graduates to go for higher studies leading to excellent research contributions to the Society.
3. To train the Graduates to practice lifelong learning for continuing professional development.

**PROGRAMME OUTCOME**

1. Ability to acquire and apply fundamental principles of Computer Science and Engineering.
2. Capability to communicate effectively.
3. Acquisition of technical competence in specialised areas of computing discipline.
4. Ability to identify, formulate and model problems and find engineering solutions based on a systematic approach.
5. Ability to conduct investigation and research on engineering problems in a chosen field of specialisation.
6. Understanding of the importance of sustainability and cost-effectiveness in design and development of engineering solutions by applying techniques from Computer Science and Engineering, Mathematics and Basic Sciences.
7. Understanding and commitment to professional and ethical responsibilities.
8. Ability to be a multi-skilled engineer with good technical knowledge, management, leadership and entrepreneurial skills.
9. Awareness of the social, cultural, global and environmental responsibilities as an engineer.
10. Capability and enthusiasm for self-improvement through continuous professional development and life-long learning.

**HINDUSTAN INSTITUTE OF SCIENCE AND TECHNOLOGY  
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING  
B.Tech CSE CURRICULUM 2013-2014**

**SEMESTER I  
(Common to all Branches)**

Sl. No.	Course Code	Course Title	L	T	P	C	TCH
<b>THEORY</b>							
1.	EL 2101	Technical English	3	0	0	3	3
2.	MA 2101	Engineering Mathematics-I	3	1	0	4	4
3.	PH 2001/ CY 2001	Engineering Physics / Engineering Chemistry *	3	0	0	3	3
4.	ME 2101	Engineering Graphics	1	0	3	3	4
5.	CS 2101	Computer Programming	3	0	0	3	3
<b>Practical</b>							
6.	CS 2131	Computer Programming Laboratory	0	0	3	2	3
7.	GE 2131	Engineering Practices Laboratory-I	0	0	3	2	3
8.	EL 2131	Communication Skills Laboratory I	0	0	3	2	3
9.	PH 2031/ CY 2031	Physics Laboratory / Chemistry Laboratory *	1	0	3	3	4
		<b>Total</b>				<b>25</b>	<b>30</b>

**SEMESTER II**

Sl. No.	Course Code	Course Title	L	T	P	C	TCH
<b>THEORY</b>							
1.	MA2201	Engineering Mathematics-II #	3	1	0	4	4
2.	PH 2001/ CY 2001	Engineering Physics / Engineering Chemistry *	3	0	0	3	3
3.	EC2211	Electron Devices and Circuits	3	0	0	3	3
4.	CS2201	Object Oriented Programming and C++	3	0	0	3	3
5.	CY 2002	Environmental Science and Engineering	3	0	0	3	3

Sl. No.	Course Code	Course Title	L	T	P	C	TCH
<b>Practical</b>							
6.	PH 2031/ CY 2031	Physics Laboratory / Chemistry Laboratory *	1	0	3	3	4
7.	GE2231	Engineering Practices Laboratory-II #	0	0	3	2	3
8.	EL 2231	Communication Skills Laboratory II #	2	0	2	3	4
9.	CS2231	Object Oriented Programming using C++	0	0	3	2	3
		<b>Total</b>				<b>26</b>	<b>30</b>

\* Depending upon the number of batches, it will be alternated between semesters 1 & 2  
# Common to all Branches

### SEMESTER III

Sl. No.	Course Code	Course Title	L	T	P	C	TCH
<b>THEORY</b>							
1.	CS2301	Data Structures	3	1	0	4	4
2.	CS2302	Java Programming	3	1	0	4	4
3.	CS2303	Database Management Systems	3	0	0	3	3
4.	MA2301	Engineering Mathematics-III\$	3	1	0	4	4
5.	EC2302	Digital Systems@	3	1	0	4	4
<b>Practical</b>							
6.	CS2331	Data Structures Laboratory	0	0	3	2	3
7.	CS2332	Java Programming Laboratory	0	0	3	2	3
8.	CS2333	Database Management Systems Laboratory	0	0	3	2	3
9.	EC2332	Digital Systems Laboratory@	0	0	3	2	3
		<b>Total</b>				<b>27</b>	<b>31</b>

\$ Common to CSE, ECE, AERO, AUTO and MECH

@ Common to CSE and ECE

### SEMESTER IV

Sl. No.	Course Code	Course Title	L	T	P	C	TCH
<b>THEORY</b>							
1.	CS2401	Operating Systems	3	0	0	3	3
2.	CS2402	Computer Architecture	4	0	0	4	4
3.	CS2403	Design and Analysis of Algorithms	3	0	0	3	3
4.	EC2502	Microprocessor and Microcontroller@	3	1	0	4	4
5.	MA2403	Probability and Queuing Theory	3	1	0	4	4
<b>Practical</b>							
6.	CS2431	Operating Systems Laboratory	0	0	3	2	3
7.	CS2432	Algorithms Laboratory	0	0	3	2	3
8.	EC2533	Microprocessor Laboratory@	0	0	3	2	3
9.	CS2434	Mini Project	0	0	6	2	6
		<b>Total</b>				<b>26</b>	<b>33</b>

@ Common to CSE and ECE

### SEMESTER V

Sl. No.	Course Code	Course Title	L	T	P	C	TCH
<b>THEORY</b>							
1.	CS2501	System Software	3	1	0	4	4
2.	CS2502	Software Engineering	3	0	0	3	3
3.	CS2503	Theory of Computation	3	0	0	3	3
4.	CS2504	Web Technology	3	0	0	3	3
5.	CS2505	Computer Networks	3	0	0	3	3
6.	MA2503	Discrete Mathematics	3	1	0	4	4
<b>Practical</b>							
7.	CS2531	System Software Laboratory	0	0	3	2	3
8.	CS2532	Web Technology Laboratory	0	0	4	2	4
9.	CS2533	Networking Laboratory	0	0	3	2	3
		<b>Total</b>				<b>26</b>	<b>29</b>

### SEMESTER VI

Sl. No.	Course Code	Course Title	L	T	P	C	TCH
<b>THEORY</b>							
1.	CS2601	Object Oriented System Design	3	0	0	3	3
2.	CS2602	XML and Web Services	3	0	0	3	3
3.	CS2603	Principles of Compiler Design	3	0	0	3	3
4.	CS2604	Distributed Computing	3	0	0	3	3
5.	***	Elective - 1	4	0	0	4	4
6.	EC2612	Digital Signal Processing	3	1	0	4	4
<b>Practical</b>							
7.	CS2631	OOSD Laboratory	0	0	3	2	3
8.	CS2632	XML and Web Services Laboratory	0	0	4	2	4
9.	CS2633	Compiler Design Laboratory	0	0	3	2	3
10	EL2431	Communication Skills & Personality Development	2	0	2	3	4
		<b>Total</b>				<b>29</b>	<b>34</b>

### SEMESTER VII

Sl. No.	Course Code	Course Title	L	T	P	C	TCH
<b>THEORY</b>							
1.	CS2701	Artificial Intelligence	4	0	0	4	4
2.	CS2702	Computer Graphics and Multimedia	4	0	0	4	4
3.	***	Elective - 2	3	0	0	3	3
4.	***	Elective - 3	3	0	0	3	3
5.	GE2001	Professional Ethics & Human Values*	3	0	0	3	3
6.	MG2001	Principles of Management*	3	0	0	3	3
<b>Practical</b>							
7.	CS2731	Computer Graphics Laboratory	0	0	3	2	3
8.	***	Laboratory for Elective 3	0	0	4	2	4
		<b>Total</b>				<b>24</b>	<b>27</b>

\* Common to all Branches

### SEMESTER VIII

Sl. No.	Course Code	Course Title	L	T	P	C	TCH
<b>THEORY</b>							
1.	CS2801	Mobile Computing	4	0	0	4	4
2.	***	Elective - 4	3	0	0	3	3
3.	***	Elective - 5	3	0	0	3	3
<b>Project</b>							
4	CS2831	Project	0	0	24	6	24
		<b>Total</b>				<b>16</b>	<b>34</b>
<b>Total Programme Credit 199</b>							

### LIST OF ELECTIVES

#### ELECTIVE-1

Sl. No.	Course Code	Course Title	L	T	P	C	TCH
<b>THEORY</b>							
1.	CS2651	Data Mining & Warehousing	4	0	0	4	4
2.	CS2652	System Modelling and Simulation	4	0	0	4	4
3.	CS2653	LINUX internals	3	0	1	4	4
4.	CS2654	Cryptography and Network Security	4	0	0	4	4
5.	MA2401	Numerical Methods	3	1	0	4	4
<b>ELECTIVE-2</b>							
1.	CS2751	Grid Computing	3	0	0	3	3
2.	CS2752	User Interface Design	3	0	0	3	3
3.	CS2753	E-Commerce	3	0	0	3	3
4.	CS2754	Software Project Management	3	0	0	3	3
5.	CS2755	Neural Networks	3	0	0	3	3
<b>ELECTIVE-3*</b>							
1.	CS2756	.Net Framework and Programming	3	0	0	3	3
2.	CS2757	Programming in ASP.NET	3	0	0	3	3
3.	CS2758	Digital Image Processing	3	0	0	3	3
4.	CS2759	Free and open source software	3	0	0	3	3
5.	CS2760	Advanced Java Programming	3	0	0	3	3



**ELECTIVE-3 LABORATORY#**

Sl. No.	Course Code	Course Title	L	T	P	C	TCH
<b>THEORY</b>							
1.	CS2732	.Net Programming Laboratory	0	0	3	2	3
2.	CS2733	ASP.Net Laboratory	0	0	3	2	3
3.	CS2734	Digital Image Processing Laboratory	0	0	3	2	3
4.	CS2735	Free and open source software Laboratory	0	0	3	2	3
5.	CS2736	Advanced Java Programming Laboratory	0	0	3	2	3
<b>ELECTIVE-4</b>							
1.	CS2851	Cloud Computing	3	0	0	3	3
2.	CS2852	Software Agents	3	0	0	3	3
3.	CS2853	Genetic Algorithms	3	0	0	3	3
4.	CS2854	Computer Vision	3	0	0	3	3
5.	CS2855	Information Security	3	0	0	3	3
<b>ELECTIVE-5</b>							
1.	CS2856	Software Quality Assurance and Software Testing	3	0	0	3	3
2.	CS2857	TCP/IP Design and Implementation	3	0	0	3	3
3.	CS2858	Real Time Systems	3	0	0	3	3
4.	CS2859	High Speed Networks	3	0	0	3	3
5.	MG2002	Total Quality Management*	3	0	0	3	3

\* Common to all branches

**Note:**

If an Elective is selected from the list given under "Elective-3", then the corresponding Laboratory is to be selected from the list given under "Elective-3 Laboratory"

## SEMESTER - I

### EL 2101 TECHNICAL ENGLISH

L T P C  
3 0 0 3

#### GOAL

The goal of the programme is to provide a theoretical input towards nurturing accomplished learners who can function effectively in the English language skills; to cultivate in them the ability to indulge in rational thinking, independent decision-making and lifelong learning; to help them become responsible members or leaders of the society in and around their workplace or living space; to communicate successfully at the individual or group level on engineering activities with the engineering community in particular, and on multi-disciplinary activities in general, with the world at large.

#### OBJECTIVES

The course should enable the students to:

1. Widen the capacity of the learners to listen to English language at the basic level and understand its meaning.
2. Communicate in an intelligible English accent and pronunciation.
3. Assist the learners in reading and grasping a passage in English.
4. Learn the art of writing simple English with correct spelling, grammar and punctuation.
5. Cultivate the ability of the learners to think and indulge in divergent and lateral thoughts.

#### OUTCOME

The students should be able to:

1. Have the self-confidence to improve upon their informative listening skills by an enhanced acquisition of the English language.
2. Speak English at the formal and informal levels and use it for daily conversation, presentation, group discussion and debate.
3. Read, comprehend and answer questions based on literary, scientific and technological texts.
4. Write instructions, recommendations, checklists, process-description, letter-writing and report writing.
5. Have the confidence to develop thinking skills and participate in brainstorming, mind-mapping, audiovisual activities, creative thinking and also answer tests in the job-selection processes.

#### UNIT I LISTENING SKILL

9

**Topics:** Listening to the sounds, silent letters & stress in English words & sentences - Listening to conversation & telephonic conversation -- Listening for general meaning & specific information -- Listening for positive & negative comments - Listening to technical topics - Listening to prose & poetry reading -- Listening exercises.

**Embedded language learning:** Sentence definition -- Spelling & punctuation -- Imperative form - Sequencing of sentences -- Gerunds -- Infinitives -- 'Wh'-questions.

#### **UNIT II SPEAKING SKILL**

**9**

Topics: Self-introduction - Expressing personal opinion - Dialogue - Conversation - Simple oral interaction -- Speaking on a topic -- Expressing views for & against -- Speaking on personal topics like hobbies, topics of interest, present & past experiences, future plans - Participating in group discussions, role plays, debates, presentations, power-point presentations & job-interviews.

Embedded language learning: Adverbs -Adjectives - Comparative and Numerical adjectives -- Nouns & compound nouns -- Prefixes and suffixes.

#### **UNIT III READING SKILL**

**9**

Topics: Reading anecdotes, short stories, poems, parts of a novel, notices, message, time tables, advertisements, leaflets, itinerary, content page - Reading pie chart & bar chart -- Skimming and scanning -- Reading for contextual meaning - Scanning for specific information -- Reading newspaper & magazine articles - Critical reading -- Reading-comprehension exercises.

Embedded language learning: Tenses - Active and passive voice -- Impersonal passive -- Words and their function -- Different grammatical forms of the same word.

#### **UNIT IV WRITING SKILL**

**9**

Topics: Writing emails, notes, messages, memos, notices, agendas, advertisements, leaflets, brochures, instructions, recommendations & checklists -- Writing paragraphs -- Comparisons & contrasts - Process description of Flow charts - Interpretation of Bar charts & Pie charts - Writing the minutes of a meeting -- Report writing -- Industrial accident reports -- Letter-writing -- Letter to the editors - Letter inviting & accepting or declining the invitation - Placing orders - Complaints -- Letter requesting permission for industrial visits or implant training, enclosing an introduction to the educational institution -- Letters of application for a job, enclosing a CV or Resume - Covering letter.

Embedded language learning: Correction of errors - Subject-verb Concord -- Articles - Prepositions - Direct and indirect speech.

#### **UNIT V THINKING SKILL**

**9**

Topics: Eliciting & imparting the knowledge of English using thinking blocks - Developing thinking skills along with critical interpretation side by side with the acquisition of English -- Decoding diagrams & pictorial representations into English words, expressions, idioms and proverbs.

Embedded language learning: General vocabulary -- Using expressions of cause and effect -- Comparison & contrast -- If-conditionals -- Expressions of purpose and means.

**TOTAL : 45**

#### **REFERENCE BOOKS**

1. Norman Whitby. Business Benchmark: Pre-Intermediate to Intermediate - BEC Preliminary. New Delhi: Cambridge University Press, 2008 (Latest South Asian edition).

2. Norman Whitby. Business Benchmark: Pre-Intermediate to Intermediate - Preliminary-Personal Study Book. New Delhi: Cambridge University Press, 2008 (Latest South Asian edition).
3. Cambridge BEC Preliminary: Self-study Edition - Practice Tests. New Delhi: Cambridge University Press, 2008 or latest South Asian edition.
4. Devaki Reddy & Shreesh Chaudhary. Technical English. New Delhi: Macmillan, 2009.
5. Rutherford, Andrea J. Basic Communication Skills for Technology. 2nd edition. New Delhi: Pearson Education, 2006.

### **MA2101 ENGINEERING MATHEMATICS - I**

**L T P C**  
**3 1 0 4**

#### **GOAL**

To create the awareness and comprehensive knowledge in Engineering Mathematics.

#### **OBJECTIVES**

The course should enable the students to:

1. Find the inverse of the matrix by using Cayley Hamilton Theorem and Diagonalisation of matrix using transformation.
2. Understand the Evolutes and Envelope of the curve.
3. Learn the solutions of second order linear differential equations of standard types and Legendre's linear differential equation.
4. Learn partial differentiations involving two and three variables and expansions of functions using Taylor series.
5. Learn the expansions of trigonometric, hyperbolic functions and their relations.

#### **OUTCOME**

The students should be able to:

1. Identify Eigen value problems from practical areas and obtain its solutions and using transformation diagonalising the matrix which would render Eigen values.
2. Find out effectively the geometrical aspects of curvature and appreciates mathematical skills in constructing evolutes and envelopes in mechanics and engineering drawing.
3. Recognize and to model mathematically and solving, the differential equations arising in science and engineering.
4. Understand and model the practical problems and solve it using maxima and minima as elegant applications of partial differentiation.
5. Acquire skills in using trigonometric and hyperbolic and inverse hyperbolic functions.

**UNIT I MATRICES****12**

Review: Basic concepts of matrices-addition, subtraction, multiplication of matrices - adjoint -inverse - solving cubic equations.

Characteristic equation - Properties of Eigen values - Eigen values and Eigen vectors - Cayley Hamilton theorem (without proof) - Verification and inverse using Cayley Hamilton theorem. Diagonalisation of matrices - Orthogonal matrices - Quadratic form - Reduction of symmetric matrices to a Canonical form using orthogonal transformation - Nature of quadratic form.

**UNIT II DIFFERENTIAL CALCULUS****12**

Review: Basic concepts of differentiation - function of function, product and quotient rules.

Methods of differentiation of functions - Cartesian form - Parametric form - Curvature - Radius of curvature - Centre of curvature - Circle of curvature. Evolutes of parabola, circle, ellipse, hyperbola and cycloid - Envelope.

**UNIT III ORDINARY DIFFERENTIAL EQUATIONS****12**

Review: Definition, formation and solutions of differential equations.

Second order differential equations with constant coefficients - Particular integrals -  $e^{ax}\cos bx$ ,  $e^{ax}\sin bx$ . Euler's homogeneous linear differential equations - Legendre's linear differential equation - Variation of parameters.

**UNIT IV PARTIAL DIFFERENTIATION****12**

Partial differentiation - differentiation involving two and three variables - Total differentiation -Simple problems. Jacobian - verification of properties of Jacobians - Simple problems. Taylor's series - Maxima and minima of functions of two and three variables.

**UNIT V TRIGONOMETRY****12**

Review: Basic results in trigonometry and complex numbers - De Moivre's theorem.

Expansions of  $\sin n\theta$ ,  $\cos n\theta$ ,  $\tan n\theta$  where  $n$  is a positive integer. Expansions of  $\theta$  in terms of sines and cosines of multiples of  $\theta$  where  $m$  and  $n$  are positive integers. Hyperbolic and inverse hyperbolic functions - Logarithms of complex numbers - Separation of complex functions into real and imaginary parts - Simple problems.

Note: Questions need not be asked from review part.

**TOTAL : 60****TEXT BOOKS**

1. Erwin Kreyzig, A Text book of Engineering Mathematics, John Wiley, 1999.
2. Grewal B.S, Higher Engineering Mathematics, Thirty Eighth Editions, Khanna Publisher, Delhi, 2004.
3. Chandrasekaran A, A Text book of Engineering Mathematics I, Dhanam Publications, Chennai, 2010.

## REFERENCE BOOKS

1. Venkataraman M.K, Engineering Mathematics, Volume I, The National Publishing Company, Chennai, 1985.
2. Kandaswamy P, Thilagavathy K and Gunavath K, Engineering Mathematics, Volume I & II, S.Chand and Company, New Delhi, 2005.
3. Bali N.P, Narayana Iyengar. N.Ch., Engineering Mathematics, laxmi Publications Pvt. Ltd, New Delhi, 2003.
4. Veerarajan T, Engineering Mathematics (for first year), Fourth Edition, Tata McGraw - Hill Publishing Company Limited, New Delhi, 2005.

## PH2001 ENGINEERING PHYSICS

L T P C  
3 0 0 3

### GOAL

To impart fundamental knowledge in various fields of Physics and its applications.

### OBJECTIVES

The course should enable the students to:

1. Develop strong fundamentals of properties and behavior of the materials
2. Enhance theoretical and modern technological aspects in acoustics and ultrasonics.
3. Enable the students to correlate the theoretical principles with application oriented study of optics.
4. Provide a strong foundation in the understanding of solids and materials testing.
5. Enrich the knowledge of students in modern engineering materials.

### OUTCOME

The students should be able to:

1. Understand the properties and behaviour of materials.
2. Have a fundamental knowledge of acoustics which would facilitate in acoustical design of buildings and on ultrasonics and be able to employ it as an engineering tool.
3. Understand the concept, working and application of lasers and fiber optics.
4. Know the fundamentals of crystal physics and non destructive testing methods.
5. Have an understanding of the production, characteristics and application of the new engineering materials. This would aid them in the material selection stage.

## UNIT I PROPERTIES OF MATTER

9

Elasticity - types of moduli of elasticity - Stress-Strain diagram - Young's modulus of elasticity - Rigidity modulus - Bulk modulus - Factors affecting elasticity - twisting couple on a wire - Torsional pendulum - determination of rigidity modulus of a wire - depression of a cantilever - Young's modulus

by cantilever - uniform and non-uniform bending - viscosity - Ostwald's viscometer - comparison of viscosities.

## **UNIT II ACOUSTICS AND ULTRASONICS**

**9**

Classification of sound - characteristics of musical sound - intensity - loudness - Weber Fechner law - Decibel - Reverberation - Reverberation time, derivation of Sabine's formula for reverberation time (Jaeger's method) - absorption coefficient and its determination - factors affecting acoustics of building (Optimum reverberation time, loudness, focusing, echo, echelon effect, resonance and noise) and their remedies. Ultrasonics - production - Magnetostriction and Piezoelectric methods - properties - applications of ultrasonics with particular reference to detection of flaws in metal ( Non - Destructive testing NDT) - SONAR.

## **UNIT III LASER AND FIBRE OPTICS**

**9**

Principle of lasers - Stimulated absorption - Spontaneous emission, stimulated emission - population inversion - pumping action - active medium - laser characteristics - Nd-Yag laser - CO<sub>2</sub> laser - Semiconductor laser - applications - optical fiber - principle and propagation of light in optical fibers - Numerical aperture and acceptance angle - types of optical fibers - single and multimode, step index and graded index fibers - applications - fiber optic communication system.

## **UNIT IV CRYSTAL PHYSICS AND NON-DESTRUCTIVE TESTING**

**9**

Crystal Physics: Lattice - Unit cell - Bravais lattice - Lattice planes - Miller indices - 'd' spacing in cubic lattice - Calculation of number of atoms per unit cell - Atomic radius - coordination number - Packing factor for SC, BCC, FCC and HCP structures.

Non Destructive Testing: Liquid penetrate method - Ultrasonic flaw detection - ultrasonic flaw detector (block diagram) - X-ray Radiography - Merits and Demerits of each method.

## **UNIT V MODERN ENGINEERING MATERIALS AND SUPERCONDUCTING MATERIALS**

**9**

Modern Engineering Materials: Metallic glasses: Preparation properties and applications. Shape memory alloys (SMA): Characteristics, applications, advantages and disadvantages of SMA. Nano Materials: Synthesis - Properties and applications.

Superconducting Materials: Superconducting phenomena - Properties of superconductors - Meissner effect - Type I and Type II superconductors - High T<sub>c</sub> superconductors (qualitative) - uses of superconductors.

**TOTAL : 45**

### **TEXT BOOKS**

1. Gaur R.K. and Gupta S.L., "Engineering Physics ", 8th edition, Dhanpat Rai publications (P) Ltd., New Delhi 2010.
2. P.Mani, "Engineering Physics ", Vol-I, Dhanam Publications, Chennai 2011.
3. Rajendran V. and Marikani A., "Applied Physics for engineers" , 3rd edition, Tata Mc Graw -Hill publishing company Ltd., New Delhi, 2003.

## REFERENCE BOOKS

1. Uma Mukherji, "Engineering Physics ", Narosa publishing house, New Delhi, 2003.
2. Arumugam M., "Engineering Physics ", Anuradha agencies, 2007.
3. Palanisamy P.K., "Engineering Physics ", SciTech Publications, Chennai 2007.
4. Arthur Beiser, "Concepts of Modern Physics", Tata Mc Graw -Hill Publications, 2007.
5. P.Charles, Poople and Frank J. Owens, "Introduction to Nanotechnology", Wiley India, 2007.

## CY2001 ENGINEERING CHEMISTRY

L T P C  
3 0 0 3

## GOAL

To impart basic principles of chemistry for engineers.

## OBJECTIVES

The course should enable the students to:

1. Make the students conversant with the basics of
  - a. Water technology and
  - b. Polymer science.
2. Provide knowledge on the requirements and properties of a few important engineering materials.
3. Educate the students on the fundamentals of corrosion and its control.
4. Give a sound knowledge on the basics of a few significant terminologies and concepts in thermodynamics.
5. Create an awareness among the present generation about the various conventional energy sources.

## OUTCOME

The students should be able to:

1. Gain basic knowledge in water analysis and suitable water treatment method. The study of polymer chemistry will give an idea on the type of polymers to be used in engineering applications.
2. Give exposure to the students on the common engineering materials and will create awareness among the students to search for new materials.
3. Gain knowledge on the effects of corrosion and protection methods will help the young minds to choose proper metal / alloys and also to create a design that has good corrosion control.
4. Have good exposure on the important aspects of basic thermodynamics will be able to understand the advanced level thermodynamics in engineering applications.



5. A good background on the various aspects of energy sources will create awareness on the need to utilize the fuel sources effectively and also for exploring new alternate energy resources.

**UNIT I WATER TECHNOLOGY AND POLYMER CHEMISTRY 9**

Hardness (Definition, Types, Units) - problems - Estimation of Hardness (EDTA Method) - Water softening - Carbonate conditioning and Calgon conditioning - Demineralization (Ion-Exchange Method) - Water Quality Parameters - Municipal Water Treatment- Desalination - Reverse Osmosis.

Classification of Polymers - PVC, Bakelite - preparation, properties and applications - Effect of Polymer Structure on Properties - Compounding of Plastics- Polymer Blends and Polymer Alloys - Definition, Examples.

**UNIT II ENGINEERING MATERIALS 9**

Properties of Alloys - Heat Treatment of Steel - Polymer Composites - types and applications.- Lubricants - Classification, properties and applications - Mechanism of Lubrication - MoS<sub>2</sub> And Graphite - Adhesives - classification and properties - Epoxy resin (Preparation, properties and applications) - Refractories - Classification, Properties and General Manufacture - Abrasives - Classification , Properties and Uses - Carbon nano tubes - preparation, properties and applications.

**UNIT III ELECTROCHEMISTRY AND CORROSION 9**

Conductometric Titration - HCl vs NaOH and mixture of acids vs NaOH - Electrochemical Series and its applications - Nernst Equation - problems - Polarization, Decomposition Potential, Over-voltage (definitions only) - Galvanic series - Corrosion (Definition, Examples, effects) - Mechanism of Dry Corrosion and Wet Corrosion - Differential aeration Corrosion , examples - Factors Influencing Corrosion - Metal and Environment - Corrosion Control - Design -Cathodic Protection methods - Protective Coatings - Galvanising - Anodising - Electroplating (Cu and Ni) and Electroless plating (Cu and Ni) - Constituents of Paints and varnish.

**UNIT IV CHEMICAL THERMODYNAMICS 9**

Thermodynamic terminology- First Law of Thermodynamics-Internal energy- enthalpy - heat capacity - work done in isothermal expansion of an ideal gas -problems - second law of thermodynamics - entropy change - phase transformations and entropy change - problems - Work Function & Free Energy Function- Maxwell's Relations-Gibbs Helmholtz equation- van't Hoff Isotherm- van't Hoff Isochore - Problems.

**UNIT V FUELS AND ENERGY SOURCES 9**

Fuels - classification - Calorific Value - Dulong's Formula - Problems - Determination of Calorific Value by Bomb Calorimeter - Coal - Proximate Analysis - problems - Octane Number - Cetane Number - Diesel Index (Definitions only) - Bio Gas - Producer Gas -Water Gas - Preparation, Properties and Uses - Batteries - Primary Cells - Leclanche Cell -Secondary Cell - Nickel Cadmium Battery - Fuel Cells - Hydrogen -Oxygen Fuel Cell - Solar Battery - Lead Acid Storage Cell - Nuclear Energy - Light water nuclear power plant.

**TOTAL : 45**

### TEXT BOOKS

1. S. S. Dara, Text Book of Engineering Chemistry, S. Chand & Company Ltd., New Delhi, 2003
2. Murthy, Agarwal & Naidu, Text Book of Engineering Chemistry, BSP, 2003.
3. S.Sumathi, Engineering Chemistry, Dhanam Publications, 2008.
4. S.Sumathi and P.S.Raghavan, Engineering Chemistry II, Dhanam Publications, 2008.

### REFERENCES

1. B. K. Sharma, Engineering chemistry, Krishna Prakasam Media (P) Ltd., 2003
2. Vogel, A text book of Qualitative Inorganic Analysis, ELBS, London, 2004
3. A. Gowarikar, Text Book of Polymer Science, 2002
4. Kuriacose & Rajaram, Vol. 1 & 2, Chemistry in Engineering and Technology, 2004
5. Puri, Sharma and Pathania, Principles of Physical Chemistry, Vishal Publishing Co. Jalandar, 2004.

## ME 2101 ENGINEERING GRAPHICS

L T P C  
1 0 3 3

### GOAL

To develop graphical skills for communicating concepts, ideas and designs of engineering products and to give exposure to national standards relating to technical drawings.

### OBJECTIVES

The course should enable the students to:

1. Introduce drawing standards and use of drawing instruments.
2. Introduce first angle projection.
3. Practice of engineering hand sketching and introduce to computer aided drafting.
4. Familiarize the students with different type of projections.
5. Introduce the process of design from sketching to parametric 3D CAD and 2D orthographic drawings to BIS.

### OUTCOME

The students should be able to:

1. Develop parametric design and the conventions of formal engineering drawing.
2. Produce and interpret 2D & 3D drawings
3. Communicate a design idea/concept graphically.
4. Examine a design critically and with understanding of CAD - The student learn to interpret drawings, and to produce designs using a combination of 2D and 3D software.

5. Get a Detailed study of an engineering artefact.

**Note: Only first angle projection is to be followed**

**BASICS OF ENGINEERING GRAPHICS 2**

Importance of graphics Use of drawing instruments - BIS conventions and specifications - drawing sheet sizes, layout and folding - lettering - Dimensioning - Geometrical constructions - Scales. Construction of curves like ellipse, parabola, cycloids and involutes.

**UNIT I PROJECTION OF POINTS, LINES AND SURFACES 15**

General principles of presentation of technical drawings as per BIS - Introduction to Orthographic projection - Naming views as per BIS - First angle projection. Projection of points. Projection of straight lines located in first quadrant (using rotating line method only). Projection of plane surfaces like polygonal lamina and circular lamina. Drawing views when the surface of the lamina is inclined to one reference plane.

**UNIT II PROJECTION OF SOLIDS 10**

Projections of simple solids like prism, pyramid, cylinder and cone - Drawing views when the axis of the solid is inclined to one reference plane.

**UNIT III DEVELOPMENT OF SURFACES 10**

Introduction to sectioning of solids. Development of lateral surfaces of truncated prisms, pyramids, cylinders and cones.

**UNIT IV ORTHOGRAPHIC PROJECTIONS 10**

Orthographic projections - Conversion of orthographic views from given pictorial views of objects, including dimensioning. Free hand sketching of Orthographic views from Pictorial views.

**UNIT V PICTORIAL PROJECTIONS 10**

Isometric projection - Isometric scale - Isometric views of simple solids like prisms, pyramids, cylinders and cones. Introduction to perspective Projections.

**COMPUTER AIDED DRAFTING (Demonstration Only) 3**

Introduction to computer aided drafting and dimensioning using appropriate software. 2D drawing commands Zoom, Picture editing commands, Dimensioning, Isometric drawing, Iso-Planes and 3D drafting. Plotting of drawing. Practice includes drawing the projection of lines and solids. Prepare isometric view of simple solids like prisms, pyramids, cylinders and cones.

**TOTAL : 60**

**TEXT BOOKS**

1. Jeyapoovan T, "Engineering Drawing and Graphics Using AutoCAD", Vikas Publishing House Pvt. Ltd., New Delhi, 2010.
2. Warren J. Luzadder and Jon. M.Duff, "Fundamentals of Engineering Drawing", Prentice Hall of India Pvt. Ltd., Eleventh Edition, 2003.

## REFERENCE BOOKS

1. Bhatt N.D and Panchal V.M, "Engineering Drawing: Plane and Solid Geometry", Charotar Publishing House, Anand-3001, 2007.
2. Thomas E. French, Charles J.Vierck and Robert J.Foster, " Engineering Drawing and Graphic Technology, McGraw- Hill Book company 13th Edition.1987.
3. Venugopal K., "Engineering Graphics", New Age International (P) Limited, New Delhi, 2008.

## CS2101 COMPUTER PROGRAMMING

L T P C  
3 0 0 3

### GOAL

To introduce computers and programming and to produce an awareness of the power of computational techniques that are currently used by engineers and scientists and to develop programming skills to a level such that problems of reasonable complexity can be tackled successfully.

### OBJECTIVES

The course should enable the students to:

1. Learn the major components of a Computer system.
2. Learn the problem solving techniques.
3. Develop skills in programming using C language.

### OUTCOME

The student should be able to:

1. Understand the interaction between different components of Computer system and number system.
2. Devise computational strategies for developing applications.
3. Develop applications (Simple to Complex) using C programming language.

### UNIT I COMPUTER FUNDAMENTALS9

Introduction - Evolution of Computers - Generations of Computer - Classification of Computers - Application of Computers - Components of a Computer System - Hardware - Software - Starting a Computer (Booting) - Number Systems.

### UNIT II COMPUTER PROGRAMMING AND LANGUAGES

9

Introduction - Problem-Solving Techniques: Algorithms, Flowchart, Pseudocode - Program Control Structures - Programming Paradigms - Programming languages - Generations of Programming Languages - Language Translators - Features of a Good Programming Languages.

### UNIT III PROGRAMMING WITH C

9

Introduction to C - The C Declaration - Operators and Expressions - Input and Output in C - Decision Statements - Loop Control Statements.

**UNIT IV FUNCTIONS, ARRAYS AND STRINGS** **9**

Functions - Storage Class - Arrays - Working with strings and standard functions.

**UNIT V POINTERS, Structures and union** **9**

Pointers - Dynamic Memory allocation - Structure and Union - Files.

**TOTAL: 45**

**TEXT BOOK**

1. IITL Education Solution Limited, Ashok Kamthane, "Computer Programming", Pearson Education Inc 2007 (Unit: I to V).

**REFERNCE BOOKS**

1. Byron S. Gottfried, "Programming with C", Second Edition, Tata McGraw Hill 2006.
2. Yashvant Kanetkar, "Let us C", Eighth edition, BPP publication 2007.
3. Stephen G.Kochan, "Programming in C - A Complete introduction to the C programming language" , Pearson Education, 2008.
4. T.JeyaPoovan, "Computer Programming Theory and Practice", Vikas Pub, New Delhi.

**CS2131 COMPUTER PROGRAMMING LABORATORY**

**L T P C**  
**0 0 3 2**

**GOAL**

To provide an awareness to develop the programming skills using computer languages.

**OBJECTIVES**

The course should enable the students to:

1. Gain knowledge about Microsoft office, Spread Sheet.
2. Learn programming concept in C.

**OUTCOMES**

The students should be able to:

1. Use MS Word to create document, table, text formatting and Mail merge options.
2. Use Excel for small calculations using formula editor, creating different types of charts and including pictures etc,
3. Write and execute C programs for small applications.

## LIST OF EXPERIMENTS

### a) Word Processing 15

1. Document creation, Text manipulation with Scientific notations
2. Table creation, Table formatting and conversion
3. Mail merge and Letter preparation
4. Drawing - flow Chart 12

### b) Spread Sheet 15

5. Chart - Line, XY, Bar and Pie.
6. Formula - formula editor.
7. Spread sheet - inclusion of object, Picture and graphics, protecting the document 9

### c) Programming in C 24

8. Write a C program to prepare the electricity bill.
9. Write a C program to demonstrate functions using
  - (a) Call by value
  - (b) Call by reference.
10. Write a C program to print the Fibonacci series for the given number.
11. Write a C program to find the factorial of number using recursion.
12. Write a C program to implement the basic arithmetic operations using Switch Case statement.
13. Write a C program to check whether the given number is an Armstrong number.
14. Write a C program to check whether the given string is a Palindrome.
15. Write a C program to create students details using Structures.
16. Write a C program to demonstrate the Command Line Arguments.
17. Write a C program to implement the Random Access in Files.
18. Write C programs to solve some of the Engineering applications

## HARDWARE/SOFTWARE REQUIRED FOR BATCH OF 30 STUDENTS

### HARDWARE

LAN system with 33 nodes (OR) Standalone PCs - 33 Nos

Printers - 3 Nos

### SOFTWARE

OS - Windows / UNIX

Application package - MS office

Software - C language

## GE 2131 ENGINEERING PRACTICES LABORATORY - I

L T P C  
0 0 3 2

### GOAL

To provide the students with hands on experience on various basic engineering practices in Civil and Mechanical Engineering.

### OBJECTIVES

The course should enable the students to

1. Relate theory and practice of basic Civil and Mechanical Engineering
2. Learn concepts of welding and machining practice
3. Learn concepts of plumbing and carpentry practice

### OUTCOMES

The students should be able to

1. Identify and use of tools, Types of joints used in welding, carpentry and plumbing operations.
2. Have hands on experience on basic fabrication techniques such as carpentry and plumbing practices.
3. Have hands on experience on basic fabrication techniques of different types of welding and basic machining practices.

### LIST OF EXPERIMENTS

#### I. MECHANICAL ENGINEERING PRACTICE

24

1. Welding  
Arc welding: Butt joints, Tee and lap joints.
2. Basic Machining  
Facing, turning, threading and drilling practices using lathe and drilling operation with vertical drilling machine.
3. Machine assembly practice  
Study of centrifugal pump
4. Study on
  - a. Smithy operations - Productions of hexagonal headed bolt.
  - b. Foundry operations - Mould preparation for gear and step cone pulley.

#### II. CIVIL ENGINEERING

21

1. Basic pipe connection using valves, couplings, unions, reducers, elbows in household fitting.
2. Practice in mixed pipe connections: Metal, plastic and flexible pipes used in household appliances.

3. Wood work: Sawing, Planning and making common joints.
4. Study of joints in door panels, wooden furniture.

**List of equipment and components**

**(For a Batch of 30 Students)**

**CIVIL**

1. Assorted components for plumbing consisting of metallic pipes, plastic pipes, flexible pipes, couplings, unions, elbows, plugs and other fittings. 15 Sets.
2. Carpentry vice (fitted to work bench) 15 Nos.
3. Standard woodworking tools 15 Sets.
4. Models of industrial trusses, door joints, furniture joints 5 each
5. Power Tools:
  - (a) Rotary Hammer 2 Nos
  - (b) Demolition Hammer 2 Nos
  - (c) Circular Saw 2 Nos
  - (d) Planer 2 Nos
  - (e) Hand Drilling Machine 2 Nos
  - (f) Jigsaw 2 Nos

**MECHANICAL**

1. Arc welding transformer with cables and holders 5 Nos.
2. Welding booth with exhaust facility 5 Nos.
3. Welding accessories like welding shield, chipping hammer, wire brush, etc. 5 Sets.
4. Oxygen and acetylene gas cylinders, blow pipe and other welding outfit. 2 Nos.
5. Centre lathe 2 Nos.
6. Hearth furnace, anvil and smithy tools 2 Sets.
7. Moulding table, foundry tools 2 Sets.
8. Power Tool: Angle Grinder 2 Nos
9. Study-purpose items: centrifugal pump, air-conditioner One each.

**TEXT BOOK :**

1. T. Jeyapoovan, M. Saravanapandian and S. pranitha, "Engineering Practices Lab Manual", 3rd Edition 2006, Vikas Publishing house (P) Ltd, New Delhi.



## EL2131 COMMUNICATION SKILLS LABORATORY I

L T P C  
0 0 3 2

### GOAL

The goal of the programme is to provide a practical input towards nurturing accomplished learners who can function effectively in the English language skills.

### OBJECTIVES

The course should enable the students to:

1. Extend the ability of the learners to be able to listen to English and comprehend its message.
2. Have a functional knowledge of spoken English.
3. Assist the learners to read and grasp the meaning of technical and non-technical passages in English.
4. Help the learners develop the art of writing without mistakes.
5. Expand the thinking capability of the learners so that they would learn how to view things from a different angle.

### OUTCOME

The students should be able to:

1. Listen to and evaluate English without difficulty and comprehend its message.
2. Develop a functional knowledge of spoken English so as to use it in the institution and at job interviews.
3. Read and comprehend the meaning of technical and non-technical passages in English.
4. Develop the art of writing so as to put down their thoughts and feelings in words.
5. Think independently and contribute creative ideas.

### UNIT I LISTENING SKILL

9

Topics: Listening to conversations and interviews of famous personalities in various fields -- Listening practice related to the TV-- Talk shows - News - Educative programmes -- Watching films for critical comments - Listening for specific information - Listening for summarizing information - Listening to monologues for taking notes - Listening to answer multiple-choice questions.

### UNIT II SPEAKING SKILL

9

Topics: Self-introduction -- Group discussion - Persuading and negotiating strategies - Practice in dialogues -- Presentations based on short stories / poems -- Speaking on personal thoughts and feelings -- academic topics - News reading - Acting as a compere -- Speaking about case studies on problems and solutions - Extempore speeches.

### UNIT III READING SKILL

9

Topics: Reading anecdotes to predict the content - Reading for interpretation -- Suggested reading -

- Short stories and poems -- Critical reading - Reading for information transfer - Reading newspaper and magazine articles for critical commentary - Reading brochures, advertisements, pamphlets for improved presentation.

#### **UNIT IV WRITING SKILL**

**9**

Topics: At the beginning of the semester, the students will be informed of a mini dissertation of 1000 words they need to submit individually on any non-technical topic of their choice. The parts of the dissertation will be the assignments carried out during the semester and submitted towards the end of the semester on a date specified by the department. This can be judged as part of the internal assessment.

#### **UNIT V THINKING SKILL**

**9**

Topics: Practice in preparing thinking blocks to decode diagrammatical representations into English words, expressions, idioms and proverbs - Inculcating interest in English using thinking blocks. Making pictures and improvising diagrams to form English words, phrases and proverbs -- Picture reading.

**TOTAL : 45**

#### **REFERENCE BOOKS**

1. Raman, Meenakshi, and Sangeetha Sharma. Technical Communication: English Skills for Engineers. 2nd edition. New Delhi: Oxford University Press, 2010.
2. Riordian, Daniel. Technical Communication. New Delhi. Cengage Learning, 2009

#### **Websites for learning English**

1. British: Learn English - British Council (Listen & Watch) - <<http://learnenglish.britishcouncil.org/>>
2. American: Randall's ESL Cyber Listening Lab - <<http://www.esl-lab.com/>>
3. Intercultural: English Listening Lesson Library Online <http://www.elllo.org/>

#### **Equipments required**

1. Career Lab:1 room
2. 2 Computers as a Server for Labs (with High Configuration)
3. LCD Projectors - 4 Nos
4. Headphones with Mic (i-ball) - 100 Nos
5. Speakers with Amplifiers, Wireless Mic and Collar Mic - 2 Sets
6. Teacher table, Teacher Chair - 1 + 1
7. Plastic Chairs - 75 Nos

**PH 2031 PHYSICS LABORATORY**

**L T P C**  
**1 0 3 3**

**GOAL**

To provide the students with hands on experience on various basic engineering practices in Physics.

**OBJECTIVE**

To expose the students for practical training through experiments to understand and appreciate the concepts learnt in Physics

**OUTCOME**

Performing the experiments related to the subject will help the students to apply the practical knowledge in industrial applications and for developing or modifying methods

S.No.	List of Experiments	Batch 2 (30)			Batch 1 (30)		
		Week	Periods allotted		Week	Periods allotted	
			L	P		L	P
1	Torsional Pendulum - Determination of rigidity modulus of the material of a wire.	1	1	3	2	1	3
2	Non Uniform Bending - Determination of Young's Modulus.	3	1	3	4	1	3
3	Viscosity -Determination of co-efficient of Viscosity of a liquid by Poiseuille's flow.	5	1	3	6	1	3
4	Lee's Disc - Determination of thermal conductivity of a bad conductor.	7	1	3	8	1	3
5	Air Wedge - Determination of thickness of a thin wire.	9	1	3	10	1	3
6	Spectrometer - Refractive index of a prism.	11	1	3	12	1	3
7	Semiconductor laser - Determination of wavelength of Laser using Grating.	13	1	3	14	1	3
	<b>TOTAL</b>		<b>7</b>	<b>21</b>		<b>7</b>	<b>21</b>
<b>56 Periods</b>							

**LIST OF EQUIPMENTS REQUIRED FOR A BATCH OF 30 STUDENTS**

1	Torsional Pendulum	(500 gm, wt, 60 cm wire Al-Ni Alloy)	5 nos.
2	Travelling Microscope	(X10)	15 nos.
3	Capillary tube	(length 10cm, dia 0.05mm)	5 nos.
4	Magnifying lens	(X 10)	15 nos.
5	Lee's disc apparatus	(std form)	5 nos.
6	Stop watch	( +/- 1 s)	5 nos.
7	Meter scale	1m length	5 nos.
8	Spectrometer	(main scale 360 deg, ver 30")	5 nos.
9	Grating	(2500 LPI)	5 nos.
10	Laser	(632.8 nm)	5 nos.
11	Semi transparent glass plate Al coating, 65 nm thickness,	50% visibility	5 nos.
12	Equilateral prism	(n = 1.54)	5 nos.
13	Thermometer	+/- 1 deg	8 nos.
14	Screw gauge	(+/- 0.001cm)	12 nos.
15	Vernier caliper	(+/- 0.01 cm)	8 nos.
16	Steam Boiler	1 L	5 nos.
17	Scale	50 cms	5 nos.
18	Cylindrical mass	100 gms	10 sets
19	Slotted wt	300 gms	5 sets
20	Heater	1.5 KW	5 nos.
21	Transformer sodium vapour lamp 1 KW	10 nos.	
22	Sodium vapour lamp	700 W	5 nos
23	Burette	50 mL	5 nos
24	Beaker	250 mL	5 nos
25	Spirit level		10 nos

**REFERENCE BOOK**

1. P.Mani, Engineering Physics Practicals, Dhanam Publications, 2011.

**CY 2031 CHEMISTRY LABORATORY**

**L T P C**  
**1 0 3 3**

**GOAL**

To provide the students with hands on experience on various basic engineering practices in Chemistry.

**OBJECTIVE**

To expose the students for practical training through experiments to understand and appreciate the concepts learnt in Chemistry.

**OUTCOME**

Performing the experiments related to the subject will help the students to apply the practical knowledge in industrial applications and for developing or modifying methods

S.No.	List of Experiments (Any Five)	Batch 2 (30)			Batch 1 (30)		
		Week	Periods allotted		Week	Periods allotted	
			L	P		L	P
1	Estimation of Commercial soda by acid-base titration	1	1	3	2	1	3
2	Determination of Percentage of nickel in an alloy	3		3	4		3
3	Determination of Temporary, permanent and total hardness of water by EDTA method	5	1	3	6	1	3
4	Determination of Chloride content in a water sample	7		3	8		3
5	Potentiometric Estimation of iron	9	1	3	10	1	3
6	Conductometric Titration of a strong acid with a strong base	11	1	3	12	1	3
7	Conductometric Titration of mixture of acids.	13	1	3	14	1	3
8	Determination of Degree of polymerization of a polymer by Viscometry	15	1	3	16	1	3
	<b>TOTAL</b>		<b>6</b>	<b>24</b>		<b>6</b>	<b>24</b>
<b>60 Periods</b>							

**List of Glassware and Equipments required for a batch of 30 students**

1	Burette	(50 mL)	30 nos.
2	Pipette	(20 mL)	30 nos.
3	Conical Flask	(250 mL)	30 nos.
4	Distilled water bottle	(1 L)	30 nos.
5	Standard flask	(100 mL)	30 nos.
6	Funnel	(small)	30 nos.
7	Glass rod	20 cm length	30 nos.
8	Reagent Bottle	(250 mL)	30 nos.
9	Reagent Bottle	(60 mL)	30 nos.
10	Beaker	(100 mL)	30 nos.
11	Oswald Viscometer	Glass	30 nos.
12	Measuring Cylinder	(25 mL)	30 nos.
13	Digital Conductivity Meter	PICO make	8 nos.
14	Conductivity cell	(K=1)	12 nos.
15	Digital Potentiometer	PICO make	8 nos.
16	Calomel Electrode	Glass	12 nos.
17	Platinum Electrode	Polypropylene	12 nos.
18	Burette Stands	Wooden	30 nos.
19	Pipette stands	Wooden	30 nos.
20	Retard stands	Metal	30 nos.
21	Porcelain Tiles	White	30 nos.
22	Clamps with Boss heads	Metal	30 nos.

**REFERENCE BOOKS**

1. J.Mendham, R.C. Denney, J.D. Barnes and N.J.K. Thomas, Vogel's Textbook of Quantative Chemical Analysis, 6th Edition, Pearson Education, 2004.
2. C. W. Garland, J. W. Nibler, D. P. Shoemaker, ;"Experiments in Physical Chemistry, 8th ed.," McGraw-Hill, New York, 2009.
3. S. Sumathi, Engineering Chemistry Practicals, Dhanam Publications, 2011.

## SEMESTER-II

### MA2201 ENGINEERING MATHEMATICS II

L T P C  
3 1 0 4

#### GOAL

To create the awareness and comprehensive knowledge in Engineering Mathematics.

#### OBJECTIVES

The course should enable the students to:

1. Understand the evaluation of the double and triple integrals in Cartesian and polar forms.
2. Know the basics of Vector calculus.
3. Know Cauchy - Riemann equations, Milne - Thomson method and Conformal mapping
4. Grasp the concept of Cauchy's integral formula, Cauchy's residue theorem and contour integration.
5. Know Laplace transform and inverse Laplace transform and their properties.

#### OUTCOME

The students should be able to:

1. Find area as double integrals and volume as triple integrals in engineering applications.
2. Evaluate the gradient, divergence, curl, line, surface and volume integrals along with the verification of classical theorems involving them.
3. Applies analytic functions and their interesting properties in science and engineering.
4. Evaluate the basics of complex integration and the concept of contour integration which is important for evaluation of certain integrals encountered in practice.
5. Have a sound knowledge of Laplace transform and its properties and their applications in solving initial and boundary value problems.

#### UNIT I MULTIPLE INTEGRALS

12

Review: Basic concepts of integration - Standard results - Substitution methods - Integration by parts - Simple problems.

Double integrals: Cartesian and polar co-ordinates - Change of variables - simple problems - Area as a double integral. Triple integrals: Cartesian co ordinates - Volume as a triple integral - simple problems.

#### UNIT II VECTOR CALCULUS

12

Review: Definition - vector, scalar - basic concepts of vector algebra - dot and cross products-properties.

Gradient, Divergence and Curl - Unit normal vector, Directional derivative - angle between surfaces-Irrotational and solenoidal vector fields. Verification and evaluation of Green's theorem - Gauss

divergence theorem and Stoke's theorem. Simple applications to regions such as square, rectangle, triangle, cuboids and rectangular parallelepipeds.

### **UNIT III ANALYTIC FUNCTIONS**

**12**

Review: Basic results in complex numbers - Cartesian and polar forms - Demoiivre's theorem.

Functions of a complex variable - Analytic function - Necessary and sufficient conditions (without proof) - Cauchy - Riemann equations - Properties of analytic function - Harmonic function - Harmonic conjugate - Construction of Analytic functions by Milne - Thomson method. Conformal mapping:  $w = z + a$ ,  $az$ ,  $1/z$  and bilinear transformation.

### **UNIT IV COMPLEX INTEGRATION**

**12**

Statement and application of Cauchy's integral theorem and Integral formula - Evaluation of integrals using the above theorems - Taylor and Laurent series expansions - Singularities - Classification. Residues - Cauchy's residue theorem (without proof) - Contour integration over unit circle and semicircular contours (excluding poles on boundaries).

### **UNIT V LAPLACE TRANSFORM**

**12**

Laplace transform - Conditions of existence - Transform of elementary functions - properties - Transforms of derivatives and integrals - Derivatives and integrals of transforms - Initial and final value theorems - Transforms of unit step function and impulse function - Transform of periodic functions. Inverse Laplace transform - Convolution theorem - Solution of linear ODE of second order with constant coefficients.

**TOTAL: 60**

**Note: Questions need not be asked from review part.**

### **TEXT BOOKS**

1. Venkatraman M.K, Mathematics, Vol.-II, National Publishing Company, Chennai, 1985.
2. Grewal B.S, Higher Engineering Mathematics, Thirty Eighth Editions, Khanna Publisher, Delhi, 2004.
3. Chandrasekaran A, Engineering Mathematics, Volume - II, Dhanam Publication, 2008.

### **REFERENCE BOOKS**

1. Kandasamy P, Engineering Mathematics Vol.II, S. Chand & Co., New Delhi, 1987.
2. Grewal B.S, "Engineering Maths - II", Sultan Chand, New Delhi, 1993.
3. Bali N.P, Manish Goyal, Text book of Engineering Mathematics, 3rd Ed, Lakshmi Publications, 2003.



## EC2211 ELECTRON DEVICES AND CIRCUITS

L T P C  
3 0 0 3

### GOAL

To understand the application of different electronic devices and simple circuits.

### OBJECTIVES

The course should enable the students to:

1. Give an overview of various semiconductor devices.
2. Analyze and design amplifier circuits, oscillators and filter circuits employing BJT, FET devices.

### OUTCOMES

The students should be able to:

1. Demonstrate the working of diodes, transistors.
2. Design and conduct experiments, analyze and interpret data.
3. Design a system, component or process as per needs and specifications.

### UNIT I DIODES

9

PN diode : Intrinsic and Extrinsic semiconductors - formation of pn junction - biasing the diode - VI characteristics of diode - static and dynamic resistance - drift and diffusion currents - transition and diffusion capacitance - diode models - PSPICE diode model.

Diode applications : HWR - FWR - power supply filters and regulators - diode clipping and clamping circuits.

Special purpose diodes: Zener diodes - zener diode applications - Varactor diode - LED - photo diode - Schottky diode - PIN diode - step recovery diode - Tunnel diode - Laser diode (discuss only the basic characteristics of various diodes).

### UNIT II BIPOLAR JUNCTION TRANSISTORS

9

Bipolar Junction Transistors : Physical structure - basic operation - the CE connection - Transistor characteristics and parameters - transistor as an amplifier - transistor as a switch - transistor biasing - dc load line operating point - bias stability - analysis of various dc bias circuits.

BJT amplifiers: Transistor modeling - PSPICE BJT model - small signal analysis of voltage divider biased CE, CB and CC amplifiers using h-parameter model - Multistage Amplifiers - frequency response of amplifiers - PSPICE simulation examples.

### UNIT III FIELD-EFFECT TRANSISTORS

9

Field-Effect Transistors : The JFET - basic operation - JFET characteristics and parameters - JFET biasing - The MOSFET - basic operation - MOSFET characteristics and parameters - MOSFET biasing - MOSFET as an analog switch.

FET amplifiers : JFET / Depletion MOSFET small signal model - PSPICE MOSFET model - small signal analysis of CS, CD and CG amplifiers - Frequency response of amplifiers - PSPICE simulation examples.

#### **UNIT IV FEEDBACK AMPLIFIERS AND OSCILLATORS**

**9**

Feedback amplifiers: General feedback structure - properties of negative feedback - basic feedback topologies - stability of feedback circuits - gain and phase margins.

Oscillators: Oscillator principles - Hartley, Colpitts, Clapp, Phase shift, Wien bridge and Crystal oscillators - their analysis and design - PSPICE simulation examples.

#### **UNIT V OPERATION AMPLIFIERS**

**9**

Introduction to op-amp : op-amp symbol, terminals, packages, specifications, block schematic - op-amp parameters - ideal op-amp - open-loop and closed-loop response Basic op-amp circuits : Inverting & noninverting amplifier - voltage follower, summing and differential amplifiers.

Op-amp applications: Differentiator, integrator, precision rectifiers - comparators and its applications - active filters (LP & HP responses only) - PSPICE simulation examples. Voltage regulators: Need for voltage regulation - basic series regulator - shunt regulator - switching regulator - IC voltage regulators.

**TOTAL : 45**

#### **TEXT BOOKS**

1. Thomas L. Floyd, Electronic Devices, Pearson Education, 6th Edition, 2002.
2. Albert Malvino, David J.Bates, Electronic Principles, Tata McGraw-Hill, 7th Ed., 2007.
3. Ramakant A. Gayakwad, OP-AMPS and Linear Integrated Circuits, Prentice Hall of India, 4th Edition.

#### **REFERENCE BOOKS**

1. David A.Bell, Electronic Devices and Circuits, Prentice Hall of India, 4th Edition, 2003.
2. Robert Boylestad, Louis Nashelsky, Electron Devices and Circuit Theory, Pearson Education, 9th Edition, 2007.
3. Jacob Millman,Christos C.Halkias, Electronic Devices and Circuits, Tata McGraw-Hill, 1991.

## CS2201 OBJECT ORIENTED PROGRAMMING AND C++

L T P C  
3 0 0 3

### GOAL

This course advances students knowledge in problem solving and programming principles for scientific and technical applications through the presentation of object-oriented programming in the C++ language. The course emphasizes data abstraction and object oriented programming design through the implementation, in C++, of classes and numerous related concepts. This includes inheritance, polymorphism, and inter-object communication, as well as techniques with which you can generalize classes, such as templates and operator overloading.

### OBJECTIVES

The course should enable the students to:

1. Object-oriented programming paradigm.
2. Advanced object-oriented features through C++ programming language.
3. Exception handling.
4. Generic classes and templates.

### OUTCOMES

The students should be able to:

1. Explain concepts in object oriented programming.
2. Write simple programs in C++.
3. Demonstrate the concept of functions, operator overloading, inheritance through C++ programs.
4. Demonstrate the concepts of exception handling, generic functions, and templates.

### UNIT I INTRODUCTION

9

OOP Paradigm: Comparison of Programming paradigms, Characteristics of Object-Oriented Programming Languages, Object-based programming languages C++: Brief History of C++, Structure of a C++ program, Difference between C and C++ - cin, cout, new, delete operators, ANSI/ISO Standard C++, Comments, Working with Variables and constant Qualifiers. Enumeration, Arrays and Pointer.

Implementing oops concepts in C++ Objects, Classes, Encapsulation, Data Abstraction, Inheritance, Polymorphism, Dynamic Binding, Message Passing, Default Parameter Value, Using Reference variables with Functions.

### UNIT II FUNCTIONS AND OVERLOADING

9

Abstract data types, Class Component, Object & Class, Constructors Default and Copy Constructor, Assignment operator deep and shallow coping, Access modifiers - private, public and protected. Implementing Class Functions within Class declaration or outside the Class declaration. Instantiation of objects, Scope resolution operator, Working with Friend Functions, Using Static Class members.

Understanding Compile Time Polymorphism function overloading Rules of Operator Overloading (Unary and Binary) as member function/friend function, Implementation of operator overloading of Arithmetic Operators, Overloading Output/Input, Prefix/ Postfix Increment and decrement Operators, Overloading comparison operators, Assignment, subscript and function call Operator , concepts of namespaces.

### **UNIT III INHERITANCE AND POLYMORPHISM**

**9**

Inheritance: Inheritance, Types of Inheritance, Abstract Classes, Ambiguity resolution using scope resolution operator and Virtual base class, Aggregation, composition vs classification hierarchies, Overriding inheritance methods, Constructors and Destructor in derived classes. Multiple Inheritance.

Polymorphism: Polymorphism, Types of Polymorphism - compile time and runtime, Understanding Dynamic polymorphism: Pointer to objects, Virtual Functions (concept of VTABLE) , pure virtual functions, Abstract Class.

### **UNIT IV EXCEPTION HANDLING**

**9**

Advanced Input/Output, Exception Handling and Manipulating strings, Using istream /ostream member functions, Using Manipulators, Creating Manipulator Functions, Understanding Implementation of Files, Writing and Reading Objects. Understanding of working and implementation of Exception Handling.

### **UNIT V TEMPLATES**

**9**

Generic Programming: and mastering STL Understanding Generic Functions with implementation of searching sorting algorithm. Overloading of Function Templates.

Understanding Class Templates using Implementation of Generic stack, linked lists: singly and doubly linked lists, Binary Search Tree basic operations. Understanding Inheritance with Generic Class.

Standard Template Library:- Understanding Components of Standard Template Library, Working of Containers, Algorithms, Iteraters and Other STL Elements. Implementation of Sequence and Associative containers for different Algorithms using their Iterator.

**TOTAL: 45**

### **REFERENCE BOOKS**

1. Ira Pohl, "Object Oriented Programming using C++", 2nd Edition, Pearson Education, 2009.
2. Nell Dale, Chips Weens, "Programming and Problem Solving with C++", Jones and Bartlett , 5th Ed., 2010
3. Behrouz A. Forouan, Richrad F. Gilberg, "Computer Science - A Structural Approach Using C++", Cengage Learning, 2004.
4. Bruce Eckel, "Thinking in C++", President, Mindview Inc., Prentice Hall, 2nd Ed., 1999.

## CY 2002 ENVIRONMENTAL SCIENCE AND ENGINEERING

L T P C  
3 0 0 3

### GOAL

To impart basic knowledge on the significance of environmental science for engineers.

### OBJECTIVES

The course should be able to:

1. Make the students aware of the existing natural resources such as forest water resources etc. and to educate them to understand the need for preserving the resources.
2. Educate the students about the functions of various ecosystems and biodiversity.
3. Provide knowledge on the various aspects of different types of pollution such as air pollution, water pollution, soil pollution etc.
4. Give a basic knowledge on the social issues such as global warming, acid rain, ozone layer depletion, nuclear hazards etc. and to educate them about the various Environmental Protection Acts.
5. Create an awareness among the present generation about the various aspects of human population and their effect on environment.

### OUTCOME

Upon successful completion of the course the outcomes are as follows,

1. The students would have understood the effects of over exploitation of water resources, forest resources etc. and their impact on day to day life on earth.
2. Knowledge on the functions of several of ecosystems will help the students to design the processes that are eco friendly.
3. Knowledge on the different types of pollution will help the young minds to device effective control measures to reduce rate of pollution.
4. Exposure on the issues such as global warming, acid rain, ozone layer depletion, and nuclear hazards will make the students understand the significances of sustainable development and the need to enforce Environmental Acts.
5. Educating on the various aspects of population explosion will create awareness on population control for effective utilization of the resources and the need to explore new alternate energy resources for a healthy environment.

### UNIT I INTRODUCTION TO ENVIRONMENTAL STUDIES AND NATURAL RESOURCES 10

Definition, scope and importance - Need for public awareness - Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people - Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems - Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies - Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture,

fertilizer-pesticide problems, water logging, salinity, case studies - Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. case studies - Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification - Role of an individual in conservation of natural resources - Equitable use of resources for sustainable lifestyles. Field study of local area to document environmental assets - river / forest / grassland / hill / mountain.

## **UNIT II ECOSYSTEMS AND BIODIVERSITY**

**14**

Concept of an ecosystem - Structure and function of an ecosystem - Producers, consumers and decomposers - Energy flow in the ecosystem - Ecological succession - Food chains, food webs and ecological pyramids - Introduction, types, characteristic features, structure and function of the (a) Forest ecosystem (b) Grassland ecosystem (c) Desert ecosystem (d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) - Introduction to Biodiversity - Definition: genetic, species and ecosystem diversity - Biogeographical classification of India - Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values - Biodiversity at global, National and local levels - India as a mega-diversity nation - Hot-spots of biodiversity - Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts - Endangered and endemic species of India - Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity. Field study of common plants, insects, birds and Field study of simple ecosystems like pond, river, hill slopes, etc.

## **UNIT III ENVIRONMENTAL POLLUTION**

**8**

Definition - Causes, effects and control measures of: (a) Air pollution (b) Water pollution (c) Soil pollution (d) Marine pollution (e) Noise pollution (f) Thermal pollution (g) Nuclear hazards - Soil waste Management: Causes, effects and control measures of urban and industrial wastes - Role of an individual in prevention of pollution - Pollution case studies - Disaster management: floods, earthquake, cyclone and landslides. Field Study of local polluted site - Urban / Rural / Industrial / Agricultural

## **UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT**

**7**

From Unsustainable to Sustainable development - Urban problems related to energy - Water conservation, rain water harvesting, watershed management - Resettlement and rehabilitation of people; its problems and concerns, case studies - Environmental ethics: Issues and possible solutions - Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies. - Wasteland reclamation - Consumerism and waste products - Environment Production Act - Air (Prevention and Control of Pollution) Act - Water (Prevention and control of Pollution) Act - Wildlife Protection Act - Forest Conservation Act - Issues involved in enforcement of environmental legislation - Public awareness.

## **UNIT V HUMAN POPULATION AND THE ENVIRONMENT**

**6**

Population growth, variation among nations - Population explosion - Family Welfare Programme - Environment and human health - Human Rights - Value Education - HIV / AIDS - Women and Child Welfare - Role of Information Technology in Environment and human health - Case studies.

**TOTAL : 45**

### TEXT BOOKS

1. Gilbert M.Masters, Introduction to Environmental Engineering and Science, Pearson Education Pvt., Ltd., Second Edition, ISBN 81-297-0277-0, 2004.
2. Miller T.G. Jr., Environmental Science, Wadsworth Publishing Co., 1971.
3. Townsend C, Harper J and Michael Begon, Essentials of Ecology, Blackwell Sci., 1999.
4. Trivedi R.K. and P.K. Goel, Introduction to Air Pollution, Techno-Science Pub., 1998.

### REFERENCE BOOKS

1. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad, India, 2004.
2. Trivedi R.K., Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards, Vol. I and II, Enviro Media.
3. Cunningham, W.P.Cooper, T.H.Gorhani, Environmental Encyclopedia, Jaico Publ., House, Mumbai, 2001.
4. Wager K.D., Environmental Management, W.B. Saunders Co., Philadelphia, USA, 1998.

### GE 2231 - ENGINEERING PRACTICES LABORATORY II LIST OF EXPERIMENTS

	L	T	P	C
	0	0	3	2
<b>LIST OF EXPERIMENTS</b>				<b>HOURS</b>
<b>Electrical Engineering:</b>				
1. Wiring for a tube light.				6
2. Wiring for a lamp and fan.				6
3. Staircase wiring				3
4. Study of (i) Iron box and (ii) Fan with Regulator				6
<b>Electronics Engineering</b>				
5. Study of Electronic components and Equipments				3
6. Characteristics of PN junction diode & measurement of Ripple factor of half wave and full wave rectifier.				9
7. Applications of OP-AMP - Inverter, Adder and Subtractor.				9
8. Study and verification of Logic Gates				3
<b>TOTAL</b>				<b>45</b>

### Components Required:

#### Electrical Engineering

Choke -	2 nos
Starter-	2 nos
Tubelight stand-	2 nos
36W tubelight-	2 nos
Fan-	2nos
40W lamp -	5nos
Single way switch-	10 nos
Two way switch-	5 nos
Iron box-	2nos
Fan with regulator opened-	1no (demo purpose)
Wires	

#### Electronics Engineering

IC Trainer Kit, Resistors, Capacitors, CRO, Function Generator, BreadBoard, Regulated Power Supply, Zener Diode, PN Junction Diode, Potentiometer, Digital Multimeter, Ammeter, Voltmeter, Wattmeter, IC 7408, IC 7432, IC 7486, IC 7400, IC 7404, IC 7402

#### TEXT BOOK

1. T. Jeyapoovan, M.Saravanapandian and S. Praniitha, "Engineering Practices Lab Manual", 3rd Edition 2006, Vikas Publishing house (P) Ltd., New Delhi.

### EL2231 COMMUNICATION SKILLS LABORATORY II

L T P C  
2 0 2 2

#### GOAL

The goal of the programme is to provide an advanced practical input towards moulding student-achievers who can use the English language with ease.

#### OBJECTIVES

The course should enable the students to :

1. Extend the power of the learners to listen to English at an advanced level and comment on it.
2. Guide the learners to speak English at the formal and informal levels.
3. Enable learners to read and grasp the in-depth meaning of technical and non-technical passages in English.



4. Help the learners develop the art of writing at the formal and informal levels.
5. Expand the thinking capability of the learners so that they would learn how to be original in their thoughts.

### **OUTCOME**

The students should be able to:

1. Listen and understand English at an advanced level and interpret its meaning.
2. Develop English language skill at the formal and informal levels and thus gain the confidence to use it without fear.
3. Read and grasp the in-depth meaning of technical and non-technical passages in English.
4. Develop the art of formal and informal writing.
5. Think independently and creatively and also verbalize their thoughts fearlessly.

### **UNIT I LISTENING SKILL**

**12**

Topics: Listening to telephonic conversations -- Listening to native British speakers -- Listening to native American speakers -- Listening to intercultural communication -- Listening to answer questions as one-liners and paragraphs -- Listening practice to identify ideas, situations and people -- Listening to group discussions -- Listening to films of short duration.

### **UNIT II SPEAKING SKILL**

**12**

Topics: Interview skills - People skills - Job interview - Body language and communication -- How to develop fluency -- Public speaking -- Speaking exercises involving the use of stress and intonation - Speaking on academic topics - Brain storming & discussion - Speaking about case studies on problems and solutions - Extempore speeches - Debating for and against an issue - Mini presentations - Generating talks and discussions based on audiovisual aids.

### **UNIT III READING SKILL**

**12**

Topics: Reading exercises for grammatical accuracy and correction of errors -- Reading comprehension exercises with critical and analytical questions based on context - Evaluation of contexts - Reading of memos, letters, notices and minutes for reading editing and proof reading -- Extensive reading of parts of relevant novels after giving the gist of the same.

### **UNIT IV WRITING SKILL**

**12**

Topics: At the beginning of the semester, the students will be informed of a mini dissertation of 2000 words they need to submit individually on any non-technical topic of their choice. The parts of the dissertation will be the assignments carried out during the semester and submitted towards the end of the semester on a date specified by the department. This can be judged as part of the internal assessment.

### **UNIT V THINKING SKILL**

**12**

Topics: Practice in preparing thinking blocks to decode pictorial representations into English words, expressions, idioms and proverbs - Eliciting the knowledge of English using thinking blocks -- Picture

rereading -- Finding meaning in the meaningless - Interpreting landscapes, simple modern art and verbal and non-verbal communication.

**TOTAL : 60**

### **REFERENCE BOOKS**

1. Ibbotson, Mark. Cambridge English for Engineering. New Delhi: Cambridge University Press, 2009.
2. Smith-Worthington Jefferson. Technical Writing for Success. New Delhi. Cengage Learning, 2007.

### **Websites**

1. British: Learn English - British Council (Business English) - <<http://learnenglish.britishcouncil.org/>>
2. BBC Learning English (General and Business English) - <<http://www.bbc.co.uk/worldservice/learningenglish/>>
3. Intercultural: English Listening Lesson Library Online <<http://www.ello.org/>>

### **Equipments required**

1. Career Lab: 1 room
2. 2 Computers as a Server for Labs (with High Configuration)
3. LCD Projectors - 4 Nos
4. Headphones with Mic (i-ball) - 100 Nos
5. Speakers with Amplifiers, Wireless Mic and Collar Mic - 2 Sets
6. Teacher table, Teacher Chair - 1 + 1
7. Plastic Chairs - 75 Nos

## **CS2231 OBJECT ORIENTED PROGRAMMING LABORATORY**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>3</b>	<b>2</b>

### **GOAL**

To practice the concepts learnt in Object Oriented Programming and C++.

### **OBJECTIVES**

The course should enable the students to:

1. Have a practical exposures in Object Oriented Programming (OOP).
2. Gain knowledge in object oriented concepts.
3. Work practically day to day problems and to solve them using C++

## OUTCOME

The students should be able to:

1. Write programs in C++ and be familiar in the OOP concepts.
2. Write programs with objects, class, inheritance, polymorphism, data abstraction, encapsulation, dynamic binding and message passing concepts.
3. Give real time solutions using C++.

## LIST OF EXPERIMENTS

### Implementation of OOP Concepts

- |  |   |
|--|---|
| 1. Programs using Constructor and Destructor.                                    | 2 |
| 2. Creation of classes and use of different types of functions.                  | 2 |
| 3. Count the number of objects created for a class using static member function. | 2 |
| 4. Write programs using function overloading and operator overloading.           | 2 |
| 5. Programs using inheritance.   | 2 |
| 6. Program using friend functions.   | 2 |
| 7. Program using virtual function.   | 2 |
| 8. Write a program using exception handling mechanism.                           | 2 |
| 9. Programs using files.   | 2 |
| 10. Programs using function templates.   | 2 |

### Program Development based on Understanding

11. Write a C++ program to create a database of personnel information system containing following information. Name, birth- date, blood group, weight, height, policy number, telephone no., driving license. Design base class with name, Date of Birth, blood group, and another class consist of height and weight. Design another base class consisting of policy number and address. Design a derived class using the base classes to store information such as telephone number and driving license number. Also provide facilities for Insertion, Deletion and modification.  
3
12. Create a message class with a constructor that takes a single string with a default value. Create a private member string and in the constructor assign the argument string to the internal string. Create two overloaded member functions called Print(): one that takes no argument and one that takes string argument.  
3
13. Define two classes to store distance. One of the classes should store distance in centimeters and meters and other should store distance in feet's and inches. Read two distances, one for each class and compute sum or difference between them as per the user's choice. Display answer in the unit provided by user. Use friend function, function overloading, default values, constructors etc  
3

**14. Write C++ program for the following.**

A bag consists of zero or more objects of the same type. Each object can be described by its color and weight. Design C++ program to create a new object. This can be done in two ways. If the user provides information about color and/or weight of the object to be created then this information will be used to create the object otherwise the object will be created using default values for these attribute(s). Provide a facility to keep track of total number of objects and total weight of objects in the bag at a given time. Also provide facility to delete an object from a bag. Use static variable and functions. 3

**15. Write a C++ program to perform String operations**

- i. = Equality
- ii. == String Copy
- iii. + Concatenation
- iv. << To display a string
- v. >> To reverse a string
- vi. Function to determine whether a string is a palindrome
- vii. To find occurrence of a sub-string. Use Operator Overloading. 3

**16. Write C++ program using three classes as**

- b. Student's personal information (name, address, phone, birth date etc)
- c. Student's academic information (Xth, XIIth and Graduation)
- d. Student's other information (project done, seminar, hobbies, sports record etc) 2

**Use multiple inheritance and print bio-data of a particular student**

- 17. Create a simple "shape" hierarchy. A base class called shape and derived classes called circle, square and triangle. In the base class write a virtual function "draw" and override this in derived classes. 3
- 18. Consider a bookshop that sells both books and tapes. Book is having title and number of pages and cost. Tape has time and cost. Using virtual functions, print the required information about book or tape. Use files to store information. 2
- 19. Write a C++ program to perform matrix operation using Templates. 3

## SEMESTER III

### CS2301 DATA STRUCTURES

L	T	P	C
3	1	0	3

#### GOAL

To provide an in-depth knowledge in problem solving techniques and data structures.

#### OBJECTIVES

The course should enable the students to:

1. Acquire knowledge on several data structures like stacks, queues, linked list, trees and graph.
2. Have better insight into linear and nonlinear data structures.
3. Learn various sorting and searching techniques.
4. Exercise the applications of data structures.
5. Have a good understanding of problem solving using data structure tools and techniques.

#### OUTCOME

The students should be able to:

1. Demonstrate the knowledge in problem solving techniques.
2. Write programs for different data structures.
3. Implement different applications using tree structures.
4. Implement various sorting techniques.
5. Apply and implement learned algorithm design techniques and data structures to solve problems using Graphs.

#### UNIT I ARRAYS AND STACKS

12

Introduction: Basic Terminology, Elementary Data Organization, Data Structure operations, Algorithm Complexity and Time-Space trade-off.

Arrays: Array Definition, Representation and Analysis, Single and Multidimensional Arrays, address calculation, application of arrays, Character String in C, Character string operation, Array as Parameters, Ordered List, Sparse Matrices, and Vectors.

Stacks: Array Representation and Implementation of stack, Operations on Stacks: Push & Pop, Array Representation of Stack, Linked Representation of Stack, Operations Associated with Stacks, Application of stack: Conversion of Infix to Prefix and Postfix Expressions, Evaluation of postfix expression using stack.

#### UNIT II QUEUES AND LINKED LIST

12

Queues: Array and linked representation and implementation of queues, Operations on Queue: Create, Add, Delete, Full and Empty. Circular queue, Deque, and Priority Queue.

Linked list: Representation and Implementation of Singly Linked Lists, Two-way Header List, Traversing and Searching of Linked List, Overflow and Underflow, Insertion and deletion to/from Linked Lists, Insertion and deletion Algorithms, Doubly linked list, Linked List in Array, Polynomial representation and addition, Generalized linked list, Garbage Collection and Compaction.

### **UNIT III TREES AND HASHING**

**12**

Trees: Basic terminology, Binary Trees, Binary tree representation, algebraic Expressions, Complete Binary Tree. Extended Binary Trees, Array and Linked Representation of Binary trees, Traversing Binary trees, Threaded Binary trees. Traversing Threaded Binary trees, Huffman algorithm.

Searching and Hashing: Sequential search, binary search, comparison and analysis, Hash Table, Hash Functions, Collision Resolution Strategies, Hash Table Implementation.

### **UNIT IV SORTING BINARY SEARCH TREES**

**12**

Sorting: Insertion Sort, Bubble Sort, Quick Sort, Two Way Merge Sort, Heap Sort, Sorting on Different Keys, Practical consideration for Internal Sorting.

Binary Search Trees: Binary Search Tree (BST), Insertion and Deletion in BST, Complexity of Search Algorithm, Path Length, AVL Trees, B-trees.

### **UNIT V GRAPHS AND FILES**

**12**

Graphs: Terminology & Representations, Graphs & Multi-graphs, Directed Graphs, Sequential Representations of Graphs, Adjacency Matrices, Traversal, Connected Component and Spanning Trees, Minimum Cost Spanning Trees.

File Structures: Physical Storage Media File Organization, Organization of records into Blocks, Sequential Files, Indexing and Hashing, Primary indices, Secondary indices, B+ Tree index Files, B Tree index Files, Indexing and Hashing Comparisons.

**TOTAL: 60**

### **TEXT BOOKS**

1. Y. Langsam, M. Augenstin and A. Tannenbaum, "Data Structures using C and C++", Pearson Education, 2nd Edition, 1995.
2. Ellis Horowitz, S. Sahni, D. Mehta, "Fundamentals of Data Structures in C++", Galgotia Book Source, New Delhi, 2006.

### **REFERENCE BOOKS**

1. M. Weiss, "Data Structures and Algorithm Analysis in C++", Pearson Education, 2006, 3rd Edition.
2. Michael Berman, "Data Structures via C++", Oxford University Press, 2002.
3. S. Lipschutz, "Data Structures", McGraw Hill, 1986.
4. Jean-Paul Tremblay, Paul. G. Soresan, "An Introduction to Data Structures with Applications", Mc-Graw Hill, 2nd edition 1984.
5. ISRD Group, "Data Structures through C++", McGraw Hill, 2011.

## CS2302 JAVA PROGRAMMING

L T P C  
3 1 0 4

### GOAL

To provide an in-depth knowledge in JAVA programming.

### OBJECTIVES

The course should enable the students to:

1. Understand the basic and advanced concepts in Java
2. Gain knowledge in the concepts of Methods, Packages and Applets
3. Build a sample applications using Java technologies

### OUTCOME

The students should be able to:

1. Implement the various object-oriented features
2. Implement various Java concepts
3. Create classes, Inheritances and Packages
4. Write programs using Applets
5. Develop Real world applications

### UNIT I INTRODUCTION

12

Object-Oriented Languages, Java's History, Creation of Java, Importance of Java for the Internet, Java's Magic : Byte-code, Its Features, Object-Oriented Programming in Java. Java Program Structure and Java's Class Library, Data Types, Variables and Operators, Operator Precedence. Selection Statements, Scope of Variable, Iterative Statement. Defining Classes & Methods, Constructors, Creating Objects of a Class, Assigning object Reference Variables, Variable this, Defining and Using a Class, Automatic Garbage Collection.

Arrays and Strings : Arrays, Arrays of Characters, String Handling Using String Class, Operations on String Handling Using, String Buffer Class.

### UNIT II INHERITANCE AND PACKAGES

12

Extending Classes and Inheritance : Using Existing Classes, Class Inheritance, Choosing Base Class, Access Attributes, Polymorphism, Multiple Levels of inheritance, Abstraction through Abstract Classes, Using Final Modifier, The Universal Super-class Object Class.

Package & Interfaces : Understanding Packages, Defining a package, Packaging up Your Classes, Adding Classes from a package to Your Program, Understanding CLASSPATH, Standard Packages, Access Protection in Packages, Concept of Interface.

### UNIT III EXCEPTION HANDLING AND MULTITHREADING

12

Exception Handling : The concept of Exceptions, Types of Exceptions, Dealing with Exceptions, Exception Objects, Defining Your Own Exceptions.

Multithreading Programming : The Java Thread Model, Understanding Threads, The Main Thread, Creating a Thread, Creating Multiple Threads, Thread Priorities, Synchronization, Deadlocks Interthread communication, Deadlocks.

**UNIT IV FILES AND APPLETS**

**12**

Input/Output in Java : I/O Basic, Byte and Character Structures, I/O Classes, Reading Console Input Writing Console Output, Reading and Writing on Files, Random Access Files, Storing and Retrieving Objects from File, Stream Benefits.

Creating Applets in Java : Applet Basics, Applet Architecture, Applet Life Cycle, Simple Applet Display Methods, Requesting Repainting, Using The Status Window, The HTML APPLET Tag Passing Parameters to Applets.

**UNIT V WOKING WITH WINDOWS AND GRAPHICS**

**12**

Working with Windows : AWT Classes, Window Fundamentals, Working with Frame, Creating a Frame Window in an Applet, Displaying Information Within a Window.

Working with Graphics and Texts : Working with Graphics, Working with Color, Setting the Paint Mode, Working with Fonts, Managing Text Output Using Font Metrics, Exploring Text and Graphics.

**TOTAL : 60**

**REFERENCE BOOKS**

1. Cay S. Horstman and Gary Cornell, "Core Java Volume I-Fundamentals", 9th Ed (Core Series), Prentice Hall, 2012.
2. Herbert Schildt, "Java 2: The Complete Reference", 5th Ed, Tata McGraw Hill, 2002.
3. Cay Horstman, "Big Java", 2nd Ed., Wiley Publications, 2005.
4. Ken Arnold, James Gosling, and David Holmes, "The Java Programming Language", 4th edition, Addison-Wesley, 2005.



## CS2303 DATABASE MANAGEMENT SYSTEMS

L T P C  
3 0 0 3

### GOAL

To learn the fundamentals of data models and to conceptualize and depict a database system using ER diagram.

### OBJECTIVES

The course should enable the students to:

1. Make a study of SQL and relational database design.
2. Understand the internal storage structures using different file and indexing techniques which will help in physical DB design.
3. Know the fundamental concepts of transaction processing- concurrency control techniques and recovery procedure.
4. Have an introductory knowledge about the emerging trends in the area of distributed DB- OODB- Data mining and Data Warehousing.
5. Learn the basics of query evaluation and optimization techniques.

### OUTCOME

The students should be able to:

1. Master the basic concepts and appreciate the applications of database systems.
2. Master the basics of SQL and construct queries using SQL.
3. Be familiar with a commercial relational database system (Oracle) by writing SQL using the system.
4. Be familiar with the relational database theory, and be able to write relational algebra expressions for queries.
5. Master in design principles for logical design of databases, including the ER method and normalization approach.

### UNIT I INTRODUCTION AND CONCEPTUAL MODELING

9

Introduction to File and Database systems- Database system structure - Data Models - Introduction to Network and Hierarchical Models - ER model - Relational Model - Relational Algebra and Calculus.

### UNIT II RELATIONAL MODEL

9

SQL - Data definition- Queries in SQL- Updates- Views - Integrity and Security - Relational Database design - Functional dependencies and Normalization for Relational Databases (up to BCNF).

### UNIT III DATA STORAGE AND QUERY PROCESSING

9

Record storage and Primary file organization- Secondary storage Devices- Operations on Files- Heap File- Sorted Files- Hashing Techniques - Index Structure for files -Different types of Indexes- B-Tree - B+Tree - Query Processing.

#### UNIT IV TRANSACTION MANAGEMENT

9

Transaction Processing - Introduction- Need for Concurrency control- Desirable properties of Transaction- Schedule and Recoverability- Serializability and Schedules - Concurrency Control - Types of Locks- Two Phases locking- Deadlock- Time stamp based concurrency control - Recovery Techniques - Concepts- Immediate Update- Deferred Update - Shadow Paging.

#### UNIT V CURRENT TRENDS

9

Object Oriented Databases - Need for Complex Data types- OO data Model- Nested relations- Complex Types- Inheritance Reference Types - Distributed databases- Homogenous and Heterogenous- Distributed data Storage - XML - Structure of XML- Data- XML Document- Schema- Querying and Transformation. - Data Mining and Data Warehousing.

**TOTAL: 45**

#### TEXT BOOK

1. Abraham Silberschatz, Henry F. Korth and S. Sudarshan- "Database System Concepts", Fourth Edition, McGraw-Hill, 2002.

#### REFERENCE BOOKS

1. Ramez Elmasri and Shamkant B. Navathe, "Fundamental Database Systems", Third Edition, Pearson Education, 2003.
2. Raghu Ramakrishnan, "Database Management System", Tata McGraw-Hill Publishing Company, 2003.
3. Hector Garcia-Molina, Jeffrey D. Ullman and Jennifer Widom- "Database System Implementation"- Pearson Education- 2000.
4. Peter Rob and Corlos Coronel- "Database System, Design, Implementation and Management", Thompson Learning Course Technology- Fifth edition, 2003.

#### MA2301 ENGINEERING MATHEMATICS III

L	T	P	C
3	1	0	4

#### GOAL

To create the awareness and comprehensive knowledge in engineering mathematics

#### OBJECTIVES

The course should enable the students to:

1. Learn techniques of solving the standard types of first and second partial differential equations.
2. Grasp the Fourier series expansions for the given periodic function in the specific intervals and their different forms.
3. Learn solving one dimensional wave equation, One and two dimensional heat equation using Fourier series.

4. Understand the problems using Fourier transform and learns their properties.
5. Understand the problems using Z - transform and learns their properties.

**OUTCOME**

The students should be able to:

1. Formulate mathematically certain practical problems in terms of partial differential equations, solve them and physically interpret the results.
2. Use the knowledge of Fourier series, their different possible forms and the frequently needed practical harmonic analysis that an engineer may have to make from discrete data.
3. Formulate and identify certain boundary and initial value problems encountered in engineering practices, decide on applicability of the Fourier series method of solution, solve the vibration and heat flow problems and then interpret the results.
4. Apply Fourier transform pair, their properties, with the possible special cases with attention to their applications
5. Apply the basics of Z - transform in its applicability to discretely varying functions, gained the skill to formulate certain problems in terms of difference equations and solve them using the Z - transform technique bringing out the elegance of the procedure involved.

**UNIT I PARTIAL DIFFERENTIAL EQUATIONS 12**

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions - Solution of standard types of first order partial differential equations - Lagrange's linear equation - Linear partial differential equations of second and higher order with constant coefficients.

**UNIT II FOURIER SERIES 12**

Dirichlet's conditions - General Fourier series - Odd and even functions - Half range sine series - Half range cosine series - Complex form of Fourier Series - Parseval's identify - Harmonic Analysis.

**UNIT III BOUNDARY VALUE PROBLEMS 12**

Classification of second order linear partial differential equations - Solutions of one dimensional wave equation - One dimensional heat equation - Steady state solution of two-dimensional heat equation (Insulated edges excluded) - Fourier series solutions in Cartesian coordinates.

**UNIT IV FOURIER TRANSFORM 12**

Fourier integral theorem (without proof) - Fourier transform pair - Sine and Cosine transforms - Properties - Transforms of simple functions - Convolution theorem.

**UNIT V Z-TRANSFORM AND DIFFERENCE EQUATIONS 12**

Z-transform - Elementary properties - Inverse Z - transform - Convolution theorem -Formation of difference equations - Solution of difference equations using Z - transform.

**TOTAL : 60**

### TEXT BOOKS

1. Grewal, B.S., Higher Engineering Mathematics, 39th Edition , Khanna Publishers, Delhi, 2007.
2. Kandasamy, P., Thilagavathy, K., and Gunavathy, K., Engineering Mathematics Volumell", S. Chand & Company Ltd., New Delhi, 4th edition 2009.
3. Wylie C. Ray and Barrett Louis, C., Advanced Engineering Mathematics, Sixth Edition, McGraw-Hill, Inc., New York, 1995.

### REFERENCE BOOKS

1. Andrews, L.A., and Shivamoggi B.K., Integral Transforms for Engineers and Applied Mathematicians, Macmillan, New York, 2007.
2. Narayanan, S., Manicavachagom Pillay, T.K. and Ramaniah, G., Advanced Mathematics for Engineering Students, Volumes II and III, S. Viswanathan (Printers and Publishers) Pvt. Ltd. Chennai, 2002.
3. Churchill, R.V. and Brown, J.W., Fourier Series and Boundary Value Problems, Fourth Edition, McGraw-Hill Book Co., Singapore, 1987.

### EC2302 DIGITAL SYSTEMS

L T P C  
3 1 0 4

### GOAL

To learn the basic methods and provide the fundamental concepts used in the design of digital systems.

### OBJECTIVES

The course should enable the students to:

1. Introduce number systems, codes, basic postulates of Boolean algebra and shows the correlation between Boolean expressions.
2. Introduce the methods for simplifying Boolean expressions
3. Outline the formal procedures for the analysis and design of combinational circuits.
4. Introduce several structural and behavioral models for synchronous sequential circuits.
5. Introduce the concept of memories and programmable logic devices.

### OUTCOME

The students should be able to:

1. Learn to reduce complex logical expressions using various postulates of Boolean algebra.
2. Learn different graphical methods for the simplification of complex logical expressions.
3. Understand the design methodology for combinational logic circuits.

4. Learn the design concepts of sequential circuits.
5. Understand the structure of various semiconductor storage devices.

**UNIT I NUMBER SYSTEMS AND BOOLEAN SWITCHING ALGEBRA 12**

Introduction to Number Systems - Positional Number Systems, Number System conversion, Binary codes -Binary arithmetic, Binary logic functions - Switching algebra - Functionally complete operation sets, Reduction of switching equations using Boolean algebra, Realization of switching function. DeMorgan's Theorem.

**UNIT II COMBINATIONAL LOGIC CIRCUIT DESIGN 12**

Logic Gates, Minimal two level networks - Minimization of POS and SOP - Design of two level gate networks - Two level NAND-NAND and NOR-NOR networks - Karnaugh maps - Advantages and Limitations - Quine McClusky's method.

**UNIT III ARITHMETIC AND STANDARD COMBINATIONAL MODULE 12**

Adders - Subtractors - Binary parallel adders, Parallel subtractors, Parallel adder/subtractors, Binary decoders and encoders - Priority encoders - Multiplexers - MUX as universal combinational modules - Demultiplexers- Introduction to Hardware Description Language (HDL[Arithmetic, Multiplexer. Demultiplexer Module Only])

**UNIT IV SEQUENTIAL CIRCUIT 12**

Flip flops - SR, JK, D and T flip flops, Master - Slave flip flops, Characteristic and excitation table - Shift registers - Counters - Synchronous and Asynchronous counters - Modulus counters, Up/Down counters - State diagram, State table, State minimization, Implication chart method.

**UNIT V MEMORIES AND PROGRAMMABLE LOGIC DEVICES 12**

Classification of memories -RAM organization - Write operation -Read operation - Memory cycle - Timing wave forms - Memory decoding - memory expansion - Static RAM Cell-Bipolar RAM cell - MOSFET RAM cell -Dynamic RAM cell -ROM organization - PROM -EPROM -EEPROM -EAPROM -Programmable Logic Devices -Programmable Logic Array (PLA)- Programmable Array Logic (PAL)- Field Programmable Gate Arrays (FPGA).

**TOTAL : 60**

**TEXT BOOK**

1. Morris Mano, "Digital design", 3rd Edition, Prentice Hall of India, 2008.

**REFERENCE BOOKS**

1. Milos Ercegovic, Jomas Lang, "Introduction to Digital Systems", Wiley publications, 1998.
2. John M. Yarbrough, "Digital logic: Applications and Design", Thomas - Vikas Publishing House, 2002.
3. R.P.Jain, "Modern digital Electronics",4th Edition, TMH, 2010.
4. William H. Gothmann, "Digital Electronics", Prentice Hall, 2001.

## CS2331 DATA STRUCTURES LABORATORY

L T P C  
0 0 3 2

### GOAL

To learn the principles of good programming practice and to have a practical training in writing efficient programs in C++

### OBJECTIVES

The course should enable the students to:

1. Implement the various data structures as Abstract Data Types (ADT)
2. Write programs to solve problems using the ADTs
3. Efficiently implement the different data structures.

### OUTCOME

The students should able to:

1. Gain knowledge in problem solving techniques.
2. Write programs using list, stack and queue.
3. Obtain confidence in storing data in tree and other related data structures.
4. Grasp knowledge in various sorting techniques.
5. Learn the concepts in graph and its traversal algorithms.

### LIST OF EXPERIMENTS (Using C++)

1. Code the following list ADT operations using array, single linked list, double linked list. 6
  - a. void is\_emptyList(List 1)
  - b. List makeNullList(size n)
  - c. Position firstPost(List 1)
  - d. Position endPost(List 1)
  - e. Position nextPost (List 1, Position p)
  - f. Position prevPos(List 1, position p)
  - g. Position find)List 1, Element x)
  - h. Position findKth(List 1, int k)
  - i. void insert(List 1, Position p)
  - j. void delete(List 1, Position p)
  - k. void append(List 1, Element x)
  - l. int cmp(List 1, Position p1, Position p2)
  - m. int cmp2(List11, List12, Position p1, Position p2)
  - n. void swap(List 1, Position p1, Position p2)
  - o. Element retrieveElement (List 1, Position p)
  - p. void print element(List 1, Position p)
2. Using the above List ADT operations, Write a menu driven program to support following higher level list operations: 6

- a. Create null list
- b. Read a list of elements into the list.
- c. Insert an element in the Kth position of the list
- d. Delete an element in the Kth position of the list
- e. Delete a given element from the list
- f. Find whether given element is present in the list
- g. Display the elements of the list
3. Write a program that reads two lists of elements, prints them, reverses them, prints the reverse list, sort the lists, print the sorted lists, merges the list, prints merge list. 5
4. Implement a polynomial ADT and write a program to read two polynomials and print them, adds the polynomials, prints the sum, multiply the polynomials and print the product. 5
5. Implement stack ADT and write a program that reads an infix arithmetic expression of variables, constants, operators (+, -, \*, /) and converts it into the corresponding postfix form. Extend the program to handle parenthesized expression also. 4
6. Implement Queue ADT and write a program that performs Radix sort on a given set of elements. 4
7. Implement the following sorting operations:- 6
  - (a) Shell Sort
  - (b) Heap Sort
  - (c) Merge Sort
  - (d) Quick Sort
8. Implement Binary Tree ADT and write a program that reads postfix Arithmetic expression form, builds the expression tree and performs tree Traversal on it. 3
9. Implement Binary search Tree ADT and write a program that interactively allows 3
  - (a) Insertion
  - (b) Deletion
  - (c) Find\_min
  - (d) Find\_max
  - (e) Find operations
10. Implement AVL Tree ADT and Write a program that interactively allows 3
  - (a) Insertion
  - (b) Deletion
  - (c) Find\_min
  - (d) Find\_max

## CS2332 JAVA PROGRAMMING LABORATORY

L T P C  
0 0 3 2

### GOAL

To learn the principles of good programming practices and to implement the learned concept of JAVA.

### OBJECTIVES

The course should enable the students to :

1. Have a practical exposures in JAVA.
2. Understand java with simple programs.
3. Understand graphics program.
4. Understand applets.
5. Write programs with multithreading concepts.

### OUTCOME

The students should be able to:

1. Write basic programs in JAVA language.
2. Write graphics programs.
3. Write applet programs.
4. Write multithreaded programs

### LIST OF EXPERIMENTS

1. Write a program to print the individual digits of a 3-digit number. 1
2. Write a program that asks the user to enter two integers, obtains the numbers from the user, and then prints the larger number followed by the words "is larger." If the numbers are equal, print the message "These numbers are equal." 2
3. Write a program that reads an integer and determines and prints whether it is odd or even. 1
4. Write a program to read N numbers and find the largest and smallest numbers. 1
5. Write a program for the multiplication of two matrices. 2
6. Write a program that accepts a shopping list of four items from the command line and stores them in a vector. Write a Menu based Program to perform the following operations using vector 3
  - a) To add an item at a specific location in the list.
  - b) To delete an item in the list.
  - c) To print the contents of the vector.



- d) To delete all elements
- e) To add an item at the end of the vector.
7. Write a program to create a String object. Initialize this object with your name. Find the length of your name using the appropriate String method. Find whether the character 'a' is in your name or not; if yes find the number of times 'a' appears in your name. Print locations of occurrences of 'a'. 3
  8. Write a program to create a StringBuffer object and illustrate how to insert characters at the beginning. 3
  9. Write a program to create a StringBuffer object and illustrate the operations of the append() and reverse() methods. 2
  10. Write a program in Java with class Rectangle with the data fields width, length, area and colour. The length, width and area are of double type and colour is of string type. The methods are get\_length(), get\_width(), get\_colour() and find\_area().  
Create two objects of Rectangle and compare their area and colour. If the area and colour both are the same for the objects then display " Matching Rectangles", otherwise display " Non-matching Rectangle". 3
  11. Create a class to represent complex numbers. A complex number has the form real part + i \* imaginary part. Provide constructor to enable an object of this class to be initialized when it is declared. Provide a no-argument constructor with default value in case no initializes are provided. Provide public methods for the following: 3
    - a) Addition of two complex numbers
    - b) Subtraction of two complex numbers
    - c) Printing complex numbers in the form (a,b) where a is the real part and b is the imaginary part.  
(Pass objects as arguments)
  12. Write a program to create a player class. Inherit the classes Cricket\_player, Football\_player and Hockey\_player from player class. 2
  13. Write a program to show how a class implements two interfaces. 2
  14. Write a program to create a package for Book details giving Book Name, Author Name, Price, year of publishing. 2
  15. A color can be created by specifying the red, green, blue values as integer parameters to the constructor of class Color. The values range from 0 to 255. Provide three horizontal scroll bars and ask the user to select the values of the colors by dragging the thumb in the scroll bar. Using the color selected, draw a rectangle. 3
  16. Create an applet for simple calculator to perform Addition, Subtraction, Multiplication and Division using button, lable and text field class. 2
  17. Draw a bar chart for the following details using Applets. 3

Subject	Tamil	English	Maths	Physics
Marks	75	85	98	56

18. Write a Java program to catch more than two exceptions. 2
19. Write a Java program to create your own exception subclass that throws exception if the sum of two integers is greater than 99. 2
20. Write a Java program for generating two threads, one for printing even numbers and other for printing odd numbers. 3

### CS2333 DBMS LABORATORY

**L T P C**  
**0 0 3 2**

#### GOAL

To provide practice in SQL and application development with an RDBMS.

#### OBJECTIVES

The course should enable the students to:

1. Learn the concepts and techniques relating to query processing SQL engines
2. Present the concepts and techniques relating to ODBC and its implementation
3. Acquire a knowledge of procedures and functions supported by SQL.
4. Make use of PL/SQL language component, variables and data types.
5. Understand the scope of the Block, Nested blocks and Labels.

#### OUTCOME

The students should be able to:

1. Implement the query processing techniques
2. Design and implement the database schema for a general problem domain.
3. Normalize a database.
4. Populate and query a database using SQL DDL / DML commands.
5. Program PL/SQL including stored procedures, stored functions, cursors, packages.

#### LIST OF EXPERIMENTS

1. To study Basic SQL commands (create database, create table, use, drop, insert) and execute the following queries using these commands: 3
  - Create a database named 'Employee'.
  - Use the database 'Employee' and create a table 'Emp' with attributes 'ename', 'ecity', 'salary', 'enumber', 'eaddress', 'deptname'.

- Create another table 'Company' with attributes 'cname', 'ccity', 'empnumber' in the database 'Employee'.
2. To study the viewing commands (select , update) and execute the following queries using these commands: 3
    - Find the names of all employees who live in Delhi.
    - Increase the salary of all employees by Rs. 5,000.
    - Find the company names where the number of employees is greater than 10,000.
    - Change the Company City to Gurgaon where the Company name is 'TCS'.
  3. To study the commands to modify the structure of table (alter, delete) and execute the following queries using these commands: 2
    - Add an attribute named ' Designation' to the table 'Emp'.
    - Modify the table 'Emp', Change the datatype of 'salary' attribute to float.
    - Drop the attribute 'dept name' from the table 'emp'.
    - Delete the entries from the table ' Company' where the number of employees are less than 500.
  4. To study the commands that involve compound conditions (and, or, in , not in, between , not between , like , not like) and execute the following queries using these commands: 2
    - Find the names of all employees who live in ' Gurgaon' and whose salary is between Rs. 20,000 and Rs. 30,000.
    - Find the names of all employees whose names begin with either letter 'A' or 'B'.
    - Find the company names where the company city is 'Delhi' and the number of employees is not between 5000 and 10,000.
    - Find the names of all companies that do not end with letter 'A'.
  5. To study the aggregate functions (sum, count, max, min, average) and execute the following queries using these commands: 2
    - Find the sum and average of salaries of all employees in computer science department.
    - Find the number of all employees who live in Delhi.
    - Find the maximum and the minimum salary in the HR department.
  6. To study the grouping commands (group by, order by) and execute the following queries using these commands: 2
    - List all employee names in descending order.
    - Find number of employees in each department where number of employees is greater than 5.
    - List all the department names where average salary of a department is Rs.10,000.

7. To study the commands involving data constraints and execute the following queries using these commands: 2
- Alter table 'Emp' and make 'enumber' as the primary key.
  - Alter table 'Company' and add the foreign key constraint.
  - Add a check constraint in the table 'Emp' such that salary has the value between 0 and Rs.1,00,000.
  - Alter table 'Company' and add unique constraint to column cname.
  - Add a default constraint to column ccity of table company with the value 'Delhi'.
8. To study the commands for aliasing and renaming and execute the following queries using these commands: 2
- Rename the name of database to 'Employee1'.
  - Rename the name of table 'Emp' to 'Emp1'.
  - Change the name of the attribute 'ename' to 'empname'.
9. To study the commands for joins ( cross join, inner join, outer join) and execute the following queries using these commands: 2
- Retrieve the complete record of an employee and its company from both the table using joins.
  - List all the employees working in the company 'TCS'.
10. To study the various set operations and execute the following queries using these commands: 2
- List the enumber of all employees who live in Delhi and whose company is in Gurgaon or if both conditions are true.
  - List the enumber of all employees who live in Delhi but whose company is not in Gurgaon.
11. To study the various scalar functions and string functions ( power, square, substring, reverse, upper, lower, concatenation) and execute the following queries using these commands:2
- Reverse the names of all employees.
  - Change the names of company cities to uppercase.
  - Concatenate name and city of the employee.
12. To study the commands for views and execute the following queries using these commands: 2
- Create a view having ename and ecity.
  - In the above view change the ecity to 'Delhi' where ename is 'John'.
  - Create a view having attributes from both the tables.
  - Update the above view and increase the salary of all employees of IT department by Rs.1000.

13. To study the commands involving indexes and execute the following queries: 2
- Create an index with attribute ename on the table employee.
  - Create a composite index with attributes cname and ccity on table company.
  - Drop all indexes created on table company.
14. To study the conditional controls and case statement in PL-SQL and execute the following queries: 3
- Calculate the average salary from table 'Emp' and print increase the salary if the average salary is less than 10,000.
  - Print the deptno from the employee table using the case statement if the deptname is 'Technical' then deptno is 1, if the deptname is 'HR' then the deptno is 2 else deptno is 3.
15. To study procedures and triggers in PL-SQL and execute the following queries: 2
- Create a procedure on table employee to display the details of employee to display the details of employees by providing them value of salaries during execution.
  - Create a trigger on table company for deletion where the whole table is displayed when delete operation is performed.
16. Consider the insurance database given below. The primary keys are made bold and the data types are specified. 2
- PERSON (**driver\_id**:string , name:string , address:string )
- CAR (**regno**:string , model:string , year:int )
- ACCIDENT (**report\_number**:int , **accd\_date**:date , location:string )
- OWNS (**driver\_id**:string , **regno**:string )
- PARTICIPATED (**driver\_id**:string , **regno**:string , **report\_number**:int , **damage\_amount**:int)
- a. Create the above tables by properly specifying the primary keys and foreign keys.
  - b. Enter at least five tuples for each relation.
  - c. Demonstrate how you
    - Update the damage amount for the car with specific regno in the accident with report number 12 to 25000.
    - Add a new accident to the database.
  - d. Find the total number of people who owned cars that were involved in accidents in the year 2008.
  - e. Find the number of accidents in which cars belonging to a specific model were involved.
17. Consider the following relations for a order processing database application in a company. 3

CUSTOMER (custno:int , cname:string , city:string )  
 ORDER (orderno:int , odate:date , custno:int , ord\_amt:int )  
 ORDER\_ITEM (orderno:int , itemno:int , quantity:int )  
 ITEM ( itemno:int , unitprice:int )  
 SHIPMENT (orderno:int , warehouseno:int , ship\_date:date )  
 WAREHOUSE (warehouseno:int , city:string )

- a. Create the above tables by properly specifying the primary keys and foreign keys.
- b. Enter at least five tuples for each relation.
- c. Produce a listing: custname , No\_of\_orders , Avg\_order\_amount , where the middle column is the total number of orders by the customer and the last column is the average order amount for that customer.
- d. List the orderno for orders that were shipped from all the warehouses that the company has in a specific city.
- e. Demonstrate the deletion of an item from the ITEM table and demonstrate a method of handling the rows in the ORDER\_ITEM table that contains this particular item.

18. Consider the following database of student enrollment in courses and books adopted for that course. 3

STUDENT (regno:string , name:string , major:string , bdate:date)  
 COURSE (courseno:int , cname:string , dept:string )  
 ENROLL (regno:string , courseno:int , sem:int , marks:int )  
 BOOK\_ADOPTION( courseno:int , sem:int , book\_isbn:int )  
 TEXT( book\_isbn:int , book\_title:string , publisher:string , author:string )

- a. Create the above tables by properly specifying the primary keys and foreign keys.
- b. Enter atleast five tuples for each relation.
- c. Demonstrate how you add a new text book to the database and make this book to be adopted by some department.
- d. Produce a list of text books ( includes courseno , book\_isbn , book\_title ) in the alphabetical order for courses offered by the 'CS' department that use more than two books.
- e. List any department that has all its books published by a specific publisher.

19. The following are maintained by a book dealer. 2

AUTHOR (author\_id:int, name:string , city:string, country:string )  
 PUBLISHER( publisher\_id:int, name:string, city:string, country:string )  
 CATALOG (book\_id:int, title:string, author\_id:int, publisher\_id:int, category\_id:int, year:int, price:int)

CATEGORY( category\_id:int , description:string )

ORDER\_DETAILS (order\_no:int , book\_id:int , quantity:int)

- a. Create the above tables by properly specifying the primary keys and foreign keys.
- b. Enter at least five tuples for each relation.
- c. Give the details of the authors who have 2 or more books in the catalog and the price of the books is greater than the average price of the books in the catalog and the year of publication is after 2000.
- d. Find the author of the book that has maximum sales.
- e. Demonstrate how you increase the price of books published by a specific publisher by 10%.

20. Consider the following database for a banking enterprise. 2

BRANCH (branch\_name:string , branch\_city:string , assets:real )

ACCOUNT(accno:int , branch\_name:string , balance:real )

DEPOSITOR (customer\_name:string , accno:int )

CUSTOMER (customer\_name:string , customer\_street:string , customer\_city:string )

LOAN ( loan\_number:int , branch\_name:string , amount:real )

BORROWER( customer\_name:string , loan\_number:int )

- a. Create the above tables by properly specifying the primary keys and foreign keys.
- b. Enter at least five tuples for each relation.
- c. Find all the customers who have at least two accounts at the main branch.
- d. Find all the customers who have an account at all the branches located in a specific city.
- e. Demonstrate how you delete all account tuples at every branch located in a specific city.

## EC2332 DIGITAL SYSTEMS LAB

L T P C  
0 0 3 2

### GOAL

To understand the design and analysis of combinational sequential circuits using logic gates and MSI devices and to implement the same using HDL

### OBJECTIVES

The course should enable the students to:

1. Understand Boolean theorems and logic gates and to design and implement combinational circuits using basic logic gates.
2. Design Combinational circuits using MSI devices.
3. Design and implement synchronous and asynchronous sequential circuits.
4. Understand Hardware description language and simulate the design of combinational and sequential circuits using Verilog

### OUTCOME

At the end of the course the student should be able to

1. Implement combinational circuits using basic logic gates.
2. Understand the design of Combinational circuits such as adders, comparators using MSI devices.
3. Understand the design and implementation of synchronous and asynchronous counters etc.
4. Understand the Hardware Description Language and design and simulate combinational circuits like arithmetic circuits and multiplexers, and sequential circuits like shift registers using Verilog.

### LIST OF EXPERIMENTS

- |  |   |
|--|---|
| 1. Design and implementation of Adders and Subtractors using logic gates.  | 3 |
| 2. Design and implementation of code converters using logic gates  | 6 |
| (i) BCD to excess-3 code and vice versa  |   |
| (ii) Binary to gray and vice-versa   |   |
| 3. Design and implementation of 4 bit binary Adder/ subtractor and BCD adder using IC 7483                               | 3 |
| 4. Design and implementation of 2Bit Magnitude Comparator using logic gates and 8 Bit Magnitude Comparator using IC 7485 | 3 |
| 5. Design and implementation of Multiplexer and De-multiplexer using logic gates .                                       | 3 |
| 6. Design and implementation of encoder and decoder using logic gates  | 3 |
| 7. Construction and verification of 4 bit ripple counter and Mod-10 counters   | 6 |
| 8. Design and implementation of 3-bit synchronous up/down counter  | 3 |



9.	Design and Verification of truth table of Master slave JK flip flop.	3
10.	Design of Asynchronous up Counter.(MOD-6)	3
11.	Design of Adder and Subtractor using VHDL.	3
12.	Design of MUX and DeMux using VHDL.	3
13.	Design of 4 bit Ripple Counter and MOD 10 Counter using VHDL.	3

#### **LIST OF EQUIPMENTS**

1. Digital IC Trainer Kit
2. VLSI Design Software Xilinx 9.1i
3. ICS Used:  
IC 74150,  
IC 74154, IC 74138, IC 74148  
IC 7400,7402,7408,7432,7486  
IC 7485, 7483  
IC 7474,7476

**SEMESTER - IV**  
**CS2401 OPERATING SYSTEMS**

**L T P C**  
**3 0 0 3**

**GOAL**

To have a thorough knowledge of processes, scheduling concepts, memory management, I/O and file systems in an operating system.

**OBJECTIVES**

The course should enable the students to:

1. Have an overview of functions of operating systems.
2. Know the components of an operating system.
3. Have a thorough knowledge of process management.
4. Have a thorough knowledge of storage management.
5. Know the concepts of file systems.

**OUTCOME**

The students should be able to:

1. Understand the basic functions of operating systems.
2. Understand the concepts of process scheduling.
3. Understand the concepts of deadlocks.
4. Understand about virtual memory and file system.
5. Understand about File system implementation and disk I/O technique.

**UNIT I INTRODUCTION**

**9**

Introduction - Computer System Organization - Computer System Architecture - Computer System Structure - Operating System Operations - Process Management - Memory Management - Storage Management - Protection Security - Distributed Systems - Operating System Services - User Operating System Interface - System Calls - Types of System calls - System Programs - Process Concept - Process Scheduling - Operations on Processes - Inter-process Communication - Examples of IPC Systems.

**UNIT II SCHEDULING**

**9**

Threads - Overview - Multithreading Models - CPU Scheduling - Basic Concepts - Scheduling Criteria - Scheduling Algorithms - Thread Scheduling - Multiple-Processor Scheduling - The Critical-Section Problem - Peterson's Solution - Synchronization Hardware - Semaphores - Classic problems of Synchronization - Monitors.

**UNIT III DEADLOCKS****9**

System Model - Deadlock Characterization - Methods for handling Deadlocks -Deadlock Prevention - Deadlock avoidance - Deadlock detection - Recovery from Deadlocks - Storage Management - Swapping - Contiguous Memory allocation - Paging - Structure of Page table - Segmentation.

**UNIT IV PAGING AND FILE SYSTEM****9**

Virtual Memory - Demand Paging - Copy-on Write - Page Replacement - Allocation of frames - Thrashing - File Concept - Access Methods - Directory and Disk Structure - File System Mounting - File Sharing - Protection.

**UNIT V FILE MANAGEMENT****9**

File System Structure - File System Implementation - Directory Implementation - Allocation Methods - Free-space Management - Disk Structure - Disk Attachment - Disk Scheduling - Disk Management - Swap-Space Management - RAID Structure

**TOTAL : 45****TEXT BOOK**

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, "Operating System Concepts", Eighth Edition, John Wiley & Sons (ASIA) Pvt. Ltd, 2009.

**REFERENCE BOOKS**

1. Harvey M. Deitel, "Operating Systems", Second Edition, Pearson Education, 2002.
2. Andrew S. Tanenbaum, "Modern Operating Systems", Prentice Hall of India, 2003.
3. William Stallings, "Operating System", Prentice Hall of India, 4th Edition, 2003.
4. Pramod Chandra P. Bhatt - "An Introduction to Operating Systems, Concepts and Practice", Prentice Hall of India, 2003.

**CS2402 COMPUTER ARCHITECTURE****L T P C**  
**4 0 0 4****GOAL**

To discuss the basic structure of a digital computer and to study in detail the organization of the Control unit, the Arithmetic and Logical unit, the Memory unit and the I/O unit.

**OBJECTIVES**

The course should enable the students to:

1. Have a thorough understanding of the basic structure and operation of a digital computer.
2. Discuss in detail the operation of the arithmetic unit including the algorithms & implementation of fixed-point and floating-point addition, subtraction, multiplication & division.
3. Study in detail the different types of control and the concept of pipelining.

4. Study the hierarchical memory system including cache memories and virtual memory.
5. Study the different ways of communicating with I/O devices and standard I/O interfaces.

### **OUTCOME**

The students should be able to:

1. Understand the basic operations and performance of a computer
2. Obtain the knowledge about the technique of doing the arithmetic operations in the computer.
3. Gain the knowledge about the different types of control units and pipelining technique.
4. Learn the concept of memory and I/O Devices

### **UNIT I BASIC STRUCTURE OF COMPUTERS 12**

Functional units - Basic operational concepts - Bus structures - Software performance - Memory locations and addresses - Memory operations - Instruction and instruction sequencing - Addressing modes - Assembly language - Basic I/O operations - Stacks and queues.

### **UNIT II ARITHMETIC UNIT 12**

Addition and subtraction of signed numbers - Design of fast adders - Multiplication of positive numbers - Signed operand multiplication and fast multiplication - Integer division - Floating point numbers and operations.

### **UNIT III BASIC PROCESSING UNIT 12**

Fundamental concepts - Execution of a complete instruction - Multiple bus organization - Hardwired control - Microprogrammed control - Pipelining - Basic concepts - Data hazards - Instruction hazards - Influence on Instruction sets - Data path and control consideration - Superscalar operation.

### **UNIT IV MEMORY SYSTEM 12**

Basic concepts - Semiconductor RAMs - ROMs - Speed - size and cost - Cache memories - Performance consideration - Virtual memory- Memory Management requirements - Secondary storage.

### **UNIT V I/O ORGANIZATION 12**

Accessing I/O devices - Interrupts - Direct Memory Access - Buses - Interface circuits - Standard I/O Interfaces (PCI, SCSI, USB).

**TOTAL : 60**

### **TEXT BOOK**

1. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, 5th Edition "Computer Organization", McGraw-Hill, 2002.

### **REFERENCE BOOKS**

1. William Stallings, "Computer Organization and Architecture - Designing for Performance", 6th Edition, Pearson Education, 2003.
2. David A.Patterson and John L.Hennessy, "Computer Organization and Design: The hardware / software interface", 2nd Edition, Morgan Kaufmann, 2002.
3. John P.Hayes, "Computer Architecture and Organization", 3rd Edition, McGraw Hill, 1998.

## CS2403 DESIGN AND ANALYSIS OF ALGORITHMS

L T P C  
3 0 0 3

### GOAL

To give an exposure on fundamental techniques which is used to design and analyze an efficient algorithm

### OBJECTIVES

The course should enable the students to:

1. Introduce the basic concepts of algorithms.
2. Introduce the mathematical aspects and analysis of algorithms.
3. Introduce sorting and searching algorithms.
4. Introduce various algorithmic techniques.
5. Introduce algorithm design methods.

### OUTCOME

The students should be able to:

1. Understand the basic concepts of algorithms.
2. Understand the concepts of mathematical related analysis of algorithms.
3. Understand the algorithms of various sorting and searching methods. Also understand the calculation of Running Time.
4. Understand the concepts of algorithmic techniques such as AVL Trees, Dynamic Programming and Greedy Techniques.
5. Design and implement the n-queens problem, Branch and Bound problem, Knapsack problem and Travelling sales man problem.

### UNIT I BASIC CONCEPTS OF ALGORITHMS 8

Introduction - Notion of Algorithm - Fundamentals of Algorithmic Solving - Important Problem types - Fundamentals of the Analysis Framework - Asymptotic Notations and Basic Efficiency Classes.

### UNIT II MATHEMATICAL ASPECTS AND ANALYSIS OF ALGORITHMS 8

Mathematical Analysis of Non-recursive Algorithm - Mathematical Analysis of Recursive Algorithm - Example: Fibonacci Numbers - Empirical Analysis of Algorithms - Algorithm Visualization.

### UNIT III ANALYSIS OF SORTING AND SEARCHING ALGORITHMS 10

Brute Force - Selection Sort and Bubble Sort - Sequential Search and Brute-force string matching - Divide and conquer - Merge sort - Quick Sort - Binary Search - Binary tree- Traversal and Related Properties - Decrease and Conquer - Insertion Sort - Depth first Search and Breadth First Search.

### UNIT IV ALGORITHMIC TECHNIQUES 10

Transform and conquer - Presorting - Balanced Search trees - AVL Trees - Heaps and Heap sort -

Dynamic Programming - Warshall's and Floyd's Algorithm - Optimal Binary Search trees - Greedy Techniques - Prim's Algorithm - Kruskal's Algorithm - Dijkstra's Algorithm - Huffman trees.

#### **UNIT V ALGORITHM DESIGN METHODS**

**9**

Backtracking - n-Queen's Problem - Hamiltonian Circuit problem - Subset-Sum problem - Branch and bound - Assignment problem - Knapsack problem - Traveling salesman problem.

**TOTAL: 45**

#### **TEXT BOOK**

1. Anany Levitin, "Introduction to the Design and Analysis of Algorithm", Pearson Education Asia, 2003.

#### **REFERENCE BOOKS**

1. T.H. Cormen, C.E. Leiserson, R.L. Rivest and C. Stein, "Introduction to Algorithms", PHI Pvt. Ltd., 2001
2. Sara Baase and Allen Van Gelder, "Computer Algorithms - Introduction to Design and Analysis", Pearson Education Asia, 2003.
3. A.V.Aho, J.E. Hopcroft and J.D.Ullman, "The Design and Analysis Of Computer Algorithms", Pearson Education Asia, 2003.

### **EC2502 MICROPROCESSORS AND MICROCONTROLLER**

**L T P C**  
**3 1 0 4**

#### **GOAL**

To learn the architecture programming and interfacing of microprocessors and Microcontrollers.

#### **OBJECTIVES**

The course should enable the students to:

1. Study 8085 architecture
2. Study 8086 architecture
3. Learn 8086 programming
4. Study Interfacing concepts
5. Study 8051 Microcontroller

#### **OUTCOME**

The students should be able to:

1. Understand the architecture, instruction sets and programming of 8085
2. Understand the architecture, Interrupts and memory interfacing of 8086
3. Program arithmetic and data manipulation using 8086

4. Understand interfacing concepts using 8056
5. Understand the architecture, instruction sets and programming of 8081

**UNIT I 8085 MICROPROCESSOR 9**

8085 Architecture - Instruction set - Addressing modes - Assembly language programming - 8 bit arithmetic - Interrupts.

**UNIT II 8086 MICROPROCESSOR 9**

Functional block diagram -signals - Memory interfacing - I/O ports and data transfer concepts Timing Diagram - Interrupt structure

**UNIT III PROGRAMMING OF 8086 PROCESSOR 9**

Instruction format and addressing modes - Assembly language format - Data transfer, data Manipulation, control and string instructions - Programming: Loop structure with counting Indexing - Look up table - Subroutine instructions stack.

**UNIT IV PHERIPHERAL INTERFACING 9**

Study of Architecture and programming of ICs: 8255 PPI, 8259 PIC, 8257 PIC, 8251 USART and 8253 Timer/Counter -Inter Integrated Circuits (I2C), Serial Peripheral Interface (SPI)- A/D and D/A converter interfacing.

**UNIT V MICRO CONTROLLER 8051 9**

Functional block diagram - Instruction format and addressing modes - Interrupt structure - Timer - I/O ports - Serial communication- Data Transfer, Manipulation, Control & I/O instructions - Simple programming

**L : 45, T : 15, TOTAL : 60**

**TEXT BOOKS**

1. Ramesh S. Gaonkar, "Microprocessor - Architecture, Programming and Applications with the 8085", Fifth Edition, Prentice Hall.,2002.
2. A K Ray and K M Burchandi "Advanced Microprocessor and Peripherals" Tata McGraw Hill - 2006.
3. Muhammad Ali Mazidi& Janice GilliMazidi, 'The 8051 Micro Controller and Embedded Systems', Pearson Education, 5th Indian reprint, 2003.

**REFERENCE BOOKS**

1. William Kleitz, 'Microprocessor and Micro Controller Fundamental of 8085 and 8051 Hardware and Software', Pearson Education, 1998.
2. Programming and Customizing the 8051 Microcontroller

## MA2403 PROBABILITY AND QUEUING THEORY

L T P C  
3 1 0 4

### GOAL

To create the awareness and comprehensive knowledge in probability and queuing theory.

### OBJECTIVES

The course should enable the students to:

1. Learn basics of probability, Baye's theorem. Understands the concept of random variable, moment generating function and their properties.
2. Learn standard distributions in discrete and continuous cases.
3. Learn two dimensional random variable and its characteristics. Understands correlation and regression and the uses of central limit theorem.
4. Learn classification of random process and Markov processes.
5. Learns the different Markovian models with finite and infinite capacity and understands to classify them.

### OUTCOME

The students should be able to:

1. Evaluates the probability using addition and multiplication theorem. Applies Baye's for practical problems to find the probability. Verifies whether a given function is a probability mass or density function.
2. Applies the discrete and continuous distributions for solving practical problems. Evaluates the moments of the distributions using moment generating function.
3. Evaluates the probability using marginal and conditional distributions. Analyzes the correlation between two variables. Finds the regression equations for the given set of data and their degree of relationship. Applies central limit theorem for practical problems and evaluates the probability of an event.
4. Verifies whether a process is of first or second order or wide sense or strictly stationary. Classifies the properties of Markov processes
5. Able to analyze and classify the models,  $M / M / 1$ ,  $M / M / C$ , finite and infinite capacity -  $M / M / ?$  queues - Finite source model -  $M/G/1$ , and be able solve practical problems related to the queuing models.

### UNIT I PROBABILITY AND RANDOM VARIABLES

12

Axioms of Probability - Conditional Probability - Total Probability - Baye's Theorem - Random variable - Probability mass function - Probability Density functions - Properties - Moments - Moment generating functions and their properties.



**UNIT II STANDARD DISTRIBUTIONS 12**

Binomial, Poisson , Geometric, Negative binomial, Uniform, Exponential, Gamma, Weibull and normal distributions and their properties - Functions of Random Variables.

**UNIT III TWO-DIMENSIONAL RANDOM VARIABLES 12**

Joint distribution - Marginal and conditional distribution - Co-variance - Correlation and Regression - Transformation of Random Variables - Central Limit Theorem.

**UNIT IV CLASSIFICATION OF RANDOM PROCESSES 12**

Definition and examples-First order, Second order, Strictly stationary, Wide- sense stationary processes, Ergodic process - Markov process-Binomial, Poisson processes.

**UNIT V QUEUING THEORY 12**

Markovian models - M / M / 1, M / M / C, finite and infinite capacity - M / M / ? queues - Finite source model - M/G/1 queue (steady state solutions only) Pollaczek - Khintchine formula - Special cases.

**TOTAL : 60**

**TEXT BOOKS**

1. Haribaskaran, "Probability and Queuing Theory", Laxmi Publications, Latest Edition.
2. Kandasamy, "Probability and Queuing Theory", S Chand & Co, Latest Edition.

**REFERENCE BOOKS**

1. Prabha Arunachalam, "Random Processes", Sci Tech Publications
2. Prof. Sivarama Krishna Doss, "Random Processes", Viji Academy, Latest edition.

**CS2431 OPERATING SYSTEMS LABORATORY**

**L T P C**  
**0 0 3 2**

**GOAL**

To implement operating system(OS) concepts using open source software (LINUX) and familiarise with low level system programming.

**OBJECTIVES**

The course should enable the students to:

1. Understand shell programming
2. Know the commands of LINUX operating system.
3. Understand the I/O system calls
4. Learn about the scheduling policies
5. Know the concepts of Semaphores and Memory management schemes.

## OUTCOME

The students should be able to:

1. Write simple shell programs
2. Implement the commands in LINUX operating system
3. Implement the I/O system calls
4. Implement the scheduling policies
5. Develop Semaphores and Memory management schemes.

## LIST OF EXPERIMENTS

Implement the following on LINUX platform using C programming.

- |  |   |
|--|---|
| 1. Shell programming   | 6 |
| a. command syntax  |   |
| b. write simple functions  |   |
| c. basic tests   |   |
| 2. Shell programming   | 5 |
| a. loops   |   |
| b. patterns  |   |
| c. expansions  |   |
| d. substitutions   |   |
| 3. Write programs using the following system calls of LINUX operating system (OS):   | 5 |
| fork, exec, getpid, exit, wait, close, stat, opendir, readdir  |   |
| 4. Write programs using the I/O system calls of LINUX OS (open, read, write, etc.)   | 5 |
| 5. Write C programs to simulate LINUX commands like ls, grep.  | 4 |
| 6. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for FCFS and SJF. For each of the scheduling policies, compute and print the average waiting time and average turnaround time             | 5 |
| 7. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for Priority and Round robin. For each of the scheduling policies, compute and print the average waiting time and average turnaround time | 5 |
| 8. Implement the Producer - Consumer problem using semaphores.   | 5 |
| 9. Implement memory management schemes.  | 5 |

## CS2432 ALGORITHMS LABORATORY

L T P C  
0 0 3 2

### GOAL

To implement different algorithmic techniques and analyze an efficiency of algorithms.

### OBJECTIVES

This course should enable the students to

1. Understand the concept of binary search and merge sort
2. Understand the concept of shortest path and travelling salesman problem
3. Understand the concept of Knapsack problem
4. Understand the concept of 8 Queen problem.

### OUTCOME

The students should be able to

1. Implement binary search and merge sort using Divide and Conquer method
2. Implement shortest path and travelling salesman problem using dynamic programming
3. Implement Knapsack problem using Greedy method
4. Implement 8 Queen problem using backtracking

### LIST OF EXPERIMENTS

- |   |   |
|---|---|
| 1. Write a program in C to implement Binary Search using Divide and Conquer Method.         | 6 |
| 2. Write a program in C to implement MaxMin Problem using Divide and Conquer Method         | 6 |
| 3. Write a program in C to implement mergesort using Divide and Conquer Method              | 5 |
| 4. Write a program in C to implement all pairs shortest path using dynamic programming.     | 6 |
| 5. Write a program in C to implement travelling salesman problem using dynamic programming. | 5 |
| 6. Write a program in C to solve Knapsack Problem using Greedy Method.                      | 6 |
| 7. Write a program in C to implement the following traversal techniques.                    | 6 |
| a. Depth First Search   |   |
| b. Breadth First Search   |   |
| 8. Write a program in C to solve 8-Queens Problem using Backtracking.                       | 5 |

## EC2533 MICROPROCESSORS AND MICROCONTROLLER LAB

L T P C  
0 0 3 2

### GOAL

To learn the architecture programming and interfacing of microprocessors and Microcontrollers.

### OBJECTIVES

The course should enable the students to:

1. Study 8085 - 8 bit arithmetic
2. Study 8086 - 16 bit arithmetic
3. Study 8086 - serial, parallel
4. Study Interfacing and programming - ADC and DAC, 8279, 8251 and 8253
5. Study 8051- arithmetic and logical

### OUTCOME

The students should be able to:

1. Write the program for arithmetic operations
2. Write the program for arithmetic operations
3. Write program for serial and parallel communications and also the timer program
4. Write program for peripheral devices
5. Write program for arithmetic, logical and interfacing stepper motor

### LIST OF EXPERIMENTS

- |  |   |
|--|---|
| 1. Introduction  | 3 |
| 2. Programs for 8 bit Arithmetic operations (Using 8085).                      | 3 |
| 3. Programs for 16 bit Arithmetic operations (Using 8085).                     | 3 |
| 4. Programs for Sorting and Searching (Using 8085, 8086).                      | 3 |
| 5. Programs for String manipulation operations (Using 8086).                   | 3 |
| 6. Programs for Digital clock and Stop watch (Using 8086).                     | 3 |
| 7. Interfacing ADC and DAC.  | 3 |
| 8. Parallel Communication between two MP Kits using Mode 1 and Mode 2 of 8255. | 3 |
| 9. Interfacing and Programming 8253.   | 3 |
| 10. Interfacing and Programming 8259.  | 3 |
| 11. Interfacing and Programming 8279.  | 3 |
| 12. Serial Communication between two MP Kits using 8251.                       | 3 |

13.	Interfacing and Programming of Stepper Motor and DC Motor Speed control.	3
14.	Practice Session	3
15.	Model Test	3

**TOTAL : 45**

#### **LIST OF EQUIPMENT'S**

1. Microprocessor Kit.  
ESA-85  
ESA-86  
ESA-51
2. Cathode Ray Oscilloscope-30 MHz
3. Power Supply (0-30)V
4. Interfacing Cards  
DAC  
ADC  
Stepper Motor
5. Interface card 8255
6. Interface card 8253/8251
7. Function Generator
8. Digital IC trainer Kit
9. Stepper Motor Kit.
10. ADC & DAC Kit
11. Parallel Communication Kit

#### **CS2434 MINI PROJECT**

**L T P C**  
**0 0 6 2**

Design and Implementation of a software project either in C++ or Java.

The student, in consultation with the faculty, should identify the area, conduct a system study, develop the design using object oriented principles and implement the database.

The project should be documented and final report is to be submitted.

#### **ASSESSMENT PROCESS**

Assessment of Mini Project, carried out at the end of IV semester, will be based on seminar, viva-voce, project demonstration and project report.

**SEMESTER - V**  
**CS2501 SYSTEM SOFTWARE**

**L T P C**  
**3 1 0 4**

**GOAL**

To provide a basic knowledge in the concepts of System Software. To understand the concepts of machine architecture and text editors.

**OBJECTIVES**

The course should enable the student to:

1. Know about the different kinds of machine architecture.
2. Have a strong foundation about many kinds of assemblers and data structures this will help in allocating literals and symbol defining.
3. Have knowledge about the machine bootstrap loader and various kinds of linker.
4. Understand the concept of macro processor with an algorithm and data structure which will help solve different macro examples.
5. Study about text editors, debugging and User interface.

**OUTCOME**

The students should be able to:

1. Acquire knowledge in the basic architecture and assigning the data values for different machine.
2. Master in the assemblers and construct the different examples.
3. Be familiar with Loader concept and Linkage by writing different kinds of programs according to the machine architecture.
4. Master in the Macro processor with expansion and Keyword parameters for defining it.
5. Be familiar in creating text editors and be able to solve different debugging techniques.

**UNIT I INTRODUCTION**

**12**

System software and machine architecture - The Simplified Instructional Computer (SIC) & SIC/XE - Machine architecture - Data and instruction formats - addressing modes - instruction sets - I/O and programming.

**UNIT II ASSEMBLERS**

**12**

Basic assembler functions - A simple SIC assembler - Assembler algorithm and data structures - Machine dependent assembler features - Instruction formats and addressing modes - Program relocation - Machine independent assembler features - Literals - Symbol-defining statements - Expressions - One pass assemblers and Multi pass assemblers - Implementation example - MASM assembler.

### UNIT III MACRO PROCESSORS

12

Basic macro processor functions - Macro Definition and Expansion - Macro Processor Algorithm and data structures - Machine-independent macro processor features - Concatenation of Macro Parameters - Generation of Unique Labels - Conditional Macro Expansion - Keyword Macro Parameters-Macro within Macro-Implementation example - MASM Macro Processor - ANSI C Macro language.

### UNIT IV LOADERS AND LINKERS

12

Basic loader functions - Design of an Absolute Loader - A Simple Bootstrap Loader - Machine dependent loader features - Relocation - Program Linking - Algorithm and Data Structures for Linking Loader - Machine-independent loader features - Automatic Library Search - Loader Options - Loader design options - Linkage Editors - Dynamic Linking - Bootstrap Loaders - Implementation example - MSDOS linker.

### UNIT V SYSTEM SOFTWARE TOOLS

12

Text editors - Overview of the Editing Process - User Interface - Editor Structure. - Interactive debugging systems - Debugging functions and capabilities - Relationship with other parts of the system - User-Interface Criteria.

**TOTAL: 60**

### TEXT BOOK

1. Leland L. Beck, "System Software - An Introduction to Systems Programming", 3rd Edition, Pearson Education Asia, 2008.

### REFERENCE BOOKS

1. D. M. Dhamdhere, "Systems Programming and Operating Systems", Second Revised Edition, Tata McGraw-Hill, 1999.
2. John J. Donovan "Systems Programming", Tata McGraw-Hill Edition, 1972.

## CS2502 SOFTWARE ENGINEERING

L T P C  
3 0 0 3

### GOAL

To provide the basic knowledge in the software Engineering and learn various techniques/tools required for efficient development of software

### OBJECTIVES

The course should enable the student to:

1. Understand the software life cycle models.
2. Understand the importance of modelling and modelling languages.
3. Design and develop correct and robust software products.
4. Understand business requirements pertaining to software development.

## OUTCOME

The students should be able to:

1. Define and develop a software project from requirement gathering to implementation.
2. Focus on the fundamentals of modelling a software project using the Unified Modelling language.

### UNIT I SOFTWARE PROCESS

9

Introduction -S/W Engineering Paradigm - life cycle models (water fall, incremental, spiral, WINWIN spiral, evolutionary, prototyping, object oriented) - system engineering - computer based system - verification - validation - life cycle process - development process -system engineering hierarchy.

### UNIT II SOFTWARE REQUIREMENTS

9

Functional and non-functional - user - system -requirement engineering process - feasibility studies - requirements - elicitation - validation and management - software prototyping - prototyping in the software process - rapid prototyping techniques - user interface prototyping -S/W document. Analysis and modeling - data, functional and behavioral models - structured analysis and data dictionary.

### UNIT III DESIGN CONCEPTS AND PRINCIPLES

9

Design process and concepts - modular design - design heuristic - design model and document. Architectural design - software architecture - data design - architectural design - transform and transaction mapping - user interface design - user interface design principles. Real time systems - Real time software design - system design - real time executives - data acquisition system - monitoring and control system. SCM - Need for SCM - Version control - Introduction to SCM process - Software configuration items.

### UNIT IV SOFTWARE TESTING

9

Taxonomy of software testing - levels - test activities - types of s/w test - black box testing - testing boundary conditions - structural testing - test coverage criteria based on data flow mechanisms - regression testing - testing in the large. S/W testing strategies - strategic approach and issues - unit testing - integration testing - validation testing - system testing and debugging.

### UNIT V SOFTWARE PROJECT MANAGEMENT

9

Measures and measurements - S/W complexity and science measure - size measure - data and logic structure measure - information flow measure. Software cost estimation - function point models - COCOMO model- Delphi method.- Defining a Task Network - Scheduling - Earned Value Analysis - Error Tracking - Software changes - program evolution dynamics - software maintenance - Architectural evolution. Taxonomy of CASE tools.

**TOTAL: 45**

## TEXT BOOK

1. Roger S.Pressman, Software engineering- A practitioner's Approach, 5th Ed., McGraw-Hill, 2001.



## REFERENCE BOOKS

1. Ian Sommerville, Software engineering, Pearson education Asia, 6th edition, 2000.
2. Pankaj Jalote- An Integrated Approach to Software Engineering, Springer Verlag, 1997.
3. James F Peters and Witold Pedryez, "Software Engineering - An Engineering Approach", John Wiley and Sons, New Delhi, 2000.
4. Ali Behforooz and Frederick J Hudson, "Software Engineering Fundamentals", Oxford University Press, New Delhi, 1996.

## CS2503 THEORY OF COMPUTATION

L T P C  
3 0 0 3

### GOAL

To have a understanding of finite state, push down automata and Turing machine.

### OBJECTIVES

The course should enable the student to:

1. Have knowledge of regular knowledge and context free language.
2. Know the relation between regular, context free and corresponding recognizers.
3. Study Turing machine and classes of problems.

### OUTCOME

The student should be able to:

1. Have gained the knowledge in deterministic and non deterministic automata.
2. Have obtained understanding in regular expressions and languages.
3. Have grasped idea in context free grammar and languages.
4. Have learnt the properties of context free languages.
5. Differentiate recursive and recursively enumerable languages.

### UNIT I AUTOMATA

9

Introduction to formal proof - Additional forms of proof - Inductive proofs -Finite Automata (FA) - Deterministic Finite Automata (DFA)- Non-deterministic Finite Automata (NFA) - Finite Automata with Epsilon transitions.

### UNIT II REGULAR EXPRESSIONS AND LANGUAGES

9

Regular Expression - FA and Regular Expressions - Proving languages not to be regular - Closure properties of regular languages - Equivalence and minimization of Automata.

### UNIT III CONTEXT-FREE GRAMMAR AND LANGUAGES

9

Context-Free Grammar (CFG) - Parse Trees - Ambiguity in grammars and languages - Definition of

the Pushdown automata - Languages of a Pushdown Automata - Equivalence of Pushdown automata and CFG, Deterministic Pushdown Automata.

**UNIT IV PROPERTIES OF CONTEXT-FREE LANGUAGES 9**

Normal forms for CFG - Pumping Lemma for CFL - Closure Properties of CFL - Turing Machines - Programming Techniques for TM.

**UNIT V UNDECIDABILITY 9**

A language that is not Recursively Enumerable (RE) - An undecidable problem that is RE - Undecidable problems about Turing Machine - Post's Correspondence Problem - The classes P and NP.

**TOTAL : 45**

**TEXT BOOK**

1. J.E.Hopcroft, R.Motwani and J.D Ullman, "Introduction to Automata Theory, Languages and Computations", Second Edition, Pearson Education, 2003.

**REFERENCE BOOKS**

1. H.R.Lewis and C.H.Papadimitriou, "Elements of The theory of Computation", Second Edition, Pearson Education/PHI, 2003
2. J.Martin, "Introduction to Languages and the Theory of Computation", Third Edition, TMH, 2003.
3. Micheal Sipser, "Introduction of the Theory and Computation", Thomson Brokecole, 1997.

**CS2504 WEB TECHNOLOGY**

**L T P C**  
**3 0 0 3**

**GOAL**

The purpose of this course is to study the fundamental concepts in web technology and to study the various server side and client side scripting languages.

**OBJECTIVES**

The course should enable the students to:

1. Understand scripting Languages
2. Understand server Side Programming
3. Understand Web Databases

**OUTCOME**

The students should be able to:

1. Understand the basic concepts of Internet programming and protocols used.
2. Create applications using HTML, DHTML,
3. Write scripts using CSS and Java Script.

4. Develop applications using SERVELETS.
5. Work with JDBC, Web Databases and XML.

**UNIT I INTRODUCTION 9**

Introduction - Network concepts - Web concepts - Internet addresses - Retrieving Data with URL - HTML - DHTML: Cascading Style Sheets.

**UNIT II COMMON GATEWAY INTERFACE 9**

Common Gateway Interface: Programming CGI Scripts - HTML Forms - Custom Database Query Scripts - Server Side Includes - Server security issues.

**UNIT III RICH INTERNET APPLICATION 9**

XHTML: Introduction, CSS- Scripting languages- Java Script: Control statements, Functions, Arrays, Objects - DOM- Ajax enable rich internet applications.

**UNIT IV SERVER SIDE PROGRAMMING 9**

Server side Programming - Active server pages - Java server pages - Java Servlets: Servlet container - Exceptions - Sessions and Session Tracking - Using Servlet context - Dynamic Content Generation - Servlet Chaining and Communications.

**UNIT V APPLICATIONS 9**

Simple applications - Internet Commerce - Database connectivity - Online databases - EDI Applications in Business - Plug-ins - Firewalls.

**TOTAL: 45**

**REFERENCE BOOKS**

1. Deitel, Deitel and Neito, "Internet and World Wide Web - How to program", Pearson Education Asia, 4th Edition, 2009.
2. Elliotte Rusty Herold, "Java Network Programming", O'Reilly Publications, 3rd Edition, 2004.
3. Jeffy Dwight, Michael Erwin and Robert Nikes "USING CGI", PHI Publications, 1997
4. Jason Hunter, William Crawford "Java Servlet Programming" O'Reilly Publications, 2nd Edition, 2001.
5. Eric Ladd and Jim O'Donnell, et al, "USING HTML 4, XML, and JAVA1.2", Prentice Hall, 2003.

## CS2505 COMPUTER NETWORKS

L T P C  
3 0 0 3

### GOAL

To introduce the concepts, terminologies and technologies used in modern data communication and computer networks.

### OBJECTIVES

The course should enable the students to:

1. Understand the concepts of data communications.
2. Study the functions of the data link layer and to introduce IEEE standards employed in computer networking.
3. Study the functions of the network layer and to get familiarized with the different protocols involved.
4. Study the functions of the transport layer and to get familiarized with the different protocols involved.

### OUTCOME

The students should be able to:

1. Be familiar with various components and categories of data communications, types of connections, topologies, protocols and standards, various transmission media and modems.
2. Detect and correct the errors using various algorithmic techniques, be aware of the various Ethernet standards and bridges.
3. Understand the internetworks, various switching approaches, methods used in IP addressing and implement the various routing and router protocols.
4. Be aware of multiplexing and demultiplexing, implement the user datagram and transmission control protocols, control the congestion and improve the quality of services.
5. Have a clear understanding of Domain Name Space, implement the various protocols involved and web security techniques.

### UNIT I DATA COMMUNICATIONS

8

Components - Direction of Data flow - networks - Components and Categories - types of Connections - Topologies - Protocols and Standards - ISO / OSI model - Transmission Media - Coaxial Cable - Fiber Optics - Line Coding - Modems - RS232 Interfacing sequences.

### UNIT II DATA LINK LAYER

10

Error - detection and correction - Parity - LRC - CRC - Hamming code - Flow Control and Error control - stop and wait - go back-N ARQ - selective repeat ARQ- sliding window - HDLC. - LAN - Ethernet IEEE 802.3 - IEEE 802.4 - IEEE 802.5 - IEEE 802.11 - FDDI - SONET - Bridges.

**UNIT III NETWORK LAYER****10**

Internetworks - Packet Switching and Datagram approach - IP addressing methods - Subnetting - Routing - Distance Vector Routing - Link State Routing - Routers.

**UNIT IV TRANSPORT LAYER****10**

Duties of transport layer - Multiplexing - Demultiplexing - Sockets - User Datagram Protocol (UDP) - Transmission Control Protocol (TCP) - Congestion Control - Quality of services (QOS) - Integrated Services.

**UNIT V APPLICATION LAYER****10**

Domain Name Space (DNS) - SMTP - FTP - HTTP - WWW - Security - Cryptography.

**TOTAL: 45****TEXT BOOK**

1. Behrouz A. Forouzan, "Data communication and Networking", 4th Ed., Tata McGraw Hill, 2009.

**REFERENCE BOOKS**

1. James F. Kurose and Keith W. Ross, "Computer Networking: A Top-Down Approach Featuring the Internet", 3rd Ed., Pearson Education, 2003.
2. L. Peterson and Peter S. Davie, "Computer Networks", 5th Ed., Morgan Kaufmann, 2011.
3. Andrew S. Tanenbaum, "Computer Networks", 5th Ed., Prentice Hall, 2010.
4. William Stallings, "Data and Computer Communication", 8th Ed., Pearson, 2006.

**MA2503 DISCRETE MATHEMATICS**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>

**GOAL**

To mathematical maturity and ability to deal with abstraction and to gain knowledge in expert system in data base and logics of a program.

**OBJECTIVES**

The course should enable the students to:

1. Learn logical connectives and equivalences in propositions, DeMorgan's Laws, normal forms, principal normal forms and theory of inference.
2. Learn logical equivalences and implications for quantified statements and the theory of inferences in predicate calculus.
3. Learn basics of set theory, relations and its properties and Hasse diagram.
4. Learn different types of functions and its classifications with examples. Understands recursive and permutation functions with examples.

5. Be exposed to basic concepts and properties of algebraic structures such as groups, semi groups, monoids, abelian group, normal subgroup and group codes.

## **OUTCOME**

The students should be able to:

1. Verify the equivalence formulae by using truth table method as well as by equivalence rules and find the principal conjunctive and disjunctive normal form and verify the validity of argument using theory of inference.
2. Symbolize the given sentence using predicate logic and verify the given predicate formula and validity of the argument using universal specification and generalization and equivalence rules.
3. Verify the algebraic statements analytically and graphically, analyze the properties of the given relations and represent the relation using matrix and graph. Be able to analyze whether a relation is equivalence or poset or not.
4. Evaluates the composition and inverse of the given function and verifies the results. Gives practical examples for one to one, onto and bijective functions. Defines initial, hashing, recursive, primitive recursive and permutation functions.
5. Be able to analyze between semi group, monoid, group and abelian group with suitable examples. Find the applications of group theory in computer arithmetic, theory of sequential machines and formal languages. Design the fast adders and error correcting codes using group codes.

## **UNIT I PROPOSITIONAL CALCULUS**

**12**

Propositions - Logical connectives - Compound propositions - Conditional and bi-conditional propositions - Truth tables - Tautologies and contradictions - Contra positive - Logic equivalences and implications - DeMorgan's Laws - Normal forms - Principal conjunctive and disjunctive normal forms - Rules of inference - Arguments - Validity of arguments.

## **UNIT II PREDICATE CALCULUS**

**12**

Predicates - Statement function - Variables - Free and bound variables - Quantifiers - Universe of discourse - Logical equivalences and implications for quantified statements - Theory of inference - The rules of universal specification and generalization - Validity of arguments.

## **UNIT III SET THEORY**

**12**

Basic concepts - Notations - Subset - Algebra of sets - The power set - Ordered pairs and Cartesian product - Relations on sets - Types of relations and their properties - Relational matrix and the graph of a relation - Partitions - Equivalence relations - Partial ordering - Poset - Hasse diagram.

## **UNIT IV FUNCTIONS**

**12**

Definitions of functions - Classification of functions - Type of functions - Examples - Composition of functions - Inverse functions - Binary and n - ary operations - Characteristic function of a set - Hashing functions - Recursive functions - Permutation functions.

## UNIT V ALGEBRAIC SYSTEMS

12

Groups, Cyclic Groups, Subgroups, Cosets, Lagrange's theorem, Normal subgroups - Codes and group codes - Basic notions of error correlation - Error recovery in group codes.

**TOTAL: 60**

### TEXT BOOKS

1. Trembly J.P and Monohar R, "Discrete Mathematical Structures with Applications to Computer Science", Tata McGraw - Hill Publishing & Co., LTD, New Delhi, 2003.
2. Ralph. P. Grimaldi, "Discrete and Combinatorial Mathematics: An Applied Introduction", Fourth Edition, Pearson Education Asia, Delhi, 2002.

### REFERENCE BOOKS

1. Bernard Kolman, Robert C. Busby, Sharan Cutler Ross, "Discrete Mathematical Structures", Fourth Indian Reprint, Pearson Education Pvt Ltd., New Delhi, 2003.
2. Kenneth H. Rosen, "Discrete Mathematics and its Applications ", Fifth edition, Tata McGraw Hill Publishing & Co, New Delhi, 2003.
3. Richard Johnsonbaugh, "Discrete Mathematics", Fifth Edition, Pearson Education Asia, New Delhi, 2002.

## CS 2531 SYSTEM SOFTWARE LABORATORY

L	T	P	C
0	0	3	2

### GOAL

To implement the basic concepts in System Software.

### OBJECTIVES

The course should enable the students to

1. Understand the concept of symbol table
2. Understand the concept of two pass and single pass assembler
3. Understand the concept of two pass and single pass macroprocessor
4. Understand the concept of loader and text editor.

### OUTCOME

The students should be able to

1. Implement symbol table
2. Implement two pass and single pass assembler
3. Implement two pass and single pass macroprocessor
4. Implement loader and text editor.

## LIST OF EXPERIMENTS

Demonstrate the following using C language.

- |     |  |   |
|-----|--|---|
| 1.  | Implement a symbol table with functions to create, insert, modify, search, and display.  | 4 |
| 2.  | Implement pass one of a two pass assembler.  | 4 |
| 3.  | Implement pass two of a two pass assembler.  | 4 |
| 4.  | Implement a single pass assembler.   | 4 |
| 5.  | Implement a two pass macro processor   | 4 |
| 6.  | Implement a single pass macro processor.   | 4 |
| 7.  | Implement an absolute loader.  | 4 |
| 8.  | Implement a relocating loader.   | 3 |
| 9.  | Implement pass one of a direct-linking loader.   | 4 |
| 10. | Implement pass two of a direct-linking loader.   | 3 |
| 11. | Implement a simple text editor with features like insertion / deletion of a character, word, and sentence.   | 4 |
| 12. | Implement a symbol table with suitable hashing (For loader exercises, output the snap shot of the main memory as it would be, after the loading has taken place) | 3 |

## CS2532 WEB TECHNOLOGY LABORATORY

L	T	P	C
0	0	4	2

### GOAL

To learn about Web Programming concepts used to develop web application

### OBJECTIVES

The course should enable the student to

1. Have knowledge in internet applications.
2. Understand HTML and DHTML applications
3. Understand scripts and servlets
4. Gain knowledge in XML and JDB.

### OUTCOME

The students should be able to :

1. Write simple internet applications.
2. Create applications using HTML, DHTML,



3. Write scripts using CSS and Java Script.
4. Develop applications using Servlets.
5. Write applications using XML and JDB.

#### LIST OF EXPERIMENTS

1. Write programs in Java to demonstrate the use of following components Text fields, buttons, Scrollbar, Choice, List and Check box 6
2. Write Java programs to demonstrate the use of various Layouts like Flow Layout, Border Layout, Grid layout, Grid bag layout and card layout 6
3. Write programs in Java to create applets incorporating the following features: 6
  - a. Create a color palette with matrix of buttons
  - b. Set background and foreground of the control text area by selecting a color from color palette.
  - c. In order to select Foreground or background use check box control as radio buttons
  - d. To set background images
4. Write programs in Java to do the following. 6
  - a. Set the URL of another server.
  - b. Download the homepage of the server.
  - c. Display the contents of home page with date, content type, and Expiration date.
  - d. Last modified and length of the home page.
5. Write programs in Java using sockets to implement the following: 6
  - a. HTTP request
  - b. FTP
  - c. SMTP
  - d. POP3
6. Write a program in Java for creating simple chat application with datagram sockets and datagram packets. 6
7. Write programs in Java using Servlets: 6
  - a. To invoke servlets from HTML forms
  - b. To invoke servlets from Applets
8. Write programs in Java to create three-tier applications using servlets 6
  - a. for conducting on-line examination.
  - b. for displaying student mark list. Assume that student information is available in a database which has been stored in a database server.

- |     |   |   |
|-----|---|---|
| 9.  | Create a web page with the following using HTML                     | 6 |
|     | a. To embed a map in a web page                                     |   |
|     | b. To fix the hot spots in that map                                 |   |
|     | c. Show all the related information when the hot spots are clicked. |   |
| 10. | Create a web page with the following.                               | 6 |
|     | a. Cascading style sheets.  |   |
|     | b. Embedded style sheets.   |   |
|     | c. Inline style sheets.   |   |

Use our college information for the web pages.

### CS 2533 NETWORKING LABORATORY

L	T	P	C
0	0	3	2

#### Goal

To simulate the various protocols, develop various applications and study the various network simulators.

#### OBJECTIVES

This course should enable the students to

1. Understand the concept of ARP and RARP
2. Have knowledge in transferring files, sliding window protocol and routing protocol
3. Gain knowledge about chat application

#### OUTCOME

The students should be able to

1. Implement ARP and RARP
2. Implement application for transferring files and simulation of sliding window and routing protocols
3. Implement client-server application for chat

#### LIST OF EXPERIMENTS

(All the programs are to be written using C)

- |    |  |   |
|----|--|---|
| 1. | Simulation of ARP / RARP.  | 5 |
| 2. | Write a program that takes a binary file as input and performs bit stuffing and CRC Computation. | 5 |
| 3. | Develop an application for transferring files over RS232.  | 5 |
| 4. | Simulation of Sliding-Window protocol.   | 5 |
| 5. | Simulation of BGP / OSPF routing protocol.   | 5 |

6. Develop a Client - Server application for chat. 5
7. Develop a Client that contacts a given DNS Server to resolve a given host name. 5
8. Write a Client to download a file from a HTTP Server. 5
9. Study of Network Simulators like NS2/Glomosim / OPNET 5

## SEMESTER VI

### CS2601 OBJECT ORIENTED SYSTEM DESIGN

L T P C  
3 0 0 3

#### GOAL

To learn the methodologies of object oriented analysis and design.

#### OBJECTIVES

The course should enable the students to:

1. Understand the Object oriented life cycle.
2. Know how to identify objects, relationships, services and attributes through UML.
3. Understand the Use case diagrams.
4. Know object oriented design process, software quality and usability.

#### OUTCOME

The students should be able to:

1. Acquire knowledge of OOAD.
2. Demonstrate the design concepts using UML diagrams.
3. Be able to practice through object oriented life cycle.

#### UNIT I INTRODUCTION

8

An Overview of Object Oriented Systems Development - Object Basics - Object Oriented Systems Development Life Cycle.

#### UNIT II OBJECT ORIENTED METHODOLOGIES

10

Rumbaugh Methodology - Booch Methodology - Jacobson Methodology - Patterns - Frameworks - Unified Approach - Unified Modeling Language - Use case - class diagram - Interactive Diagram - Package Diagram - Collaboration Diagram - State Diagram - Activity Diagram.

#### UNIT III OBJECT ORIENTED ANALYSIS

9

Identifying use cases - Object Analysis - Classification - Identifying Object relationships - Attributes and Methods.

#### UNIT IV OBJECT ORIENTED DESIGN

9

Design axioms - Designing Classes - Access Layer - Object Storage - Object Interoperability.

#### UNIT V SOFTWARE QUALITY AND USABILITY

9

Designing Interface Objects - Software Quality Assurance - System Usability - Measuring User Satisfaction.

**TOTAL: 45**

## TEXT BOOKS

1. Ali Bahrami, "Object Oriented Systems Development", Tata McGraw-Hill, 2008.
2. Martin Fowler, "UML Distilled", Second Edition, PHI/Pearson Education, 2002.

## REFERENCE BOOKS

1. Stephen R. Schach, "Introduction to Object Oriented Analysis and Design", Tata McGraw-Hill, 2003.
2. James Rumbaugh, Ivar Jacobson, Grady Booch "The Unified Modeling Language Reference Manual", Addison Wesley, 1999.
3. Hans-Erik Eriksson, Magnus Penker, Brain Lyons, David Fado, "UML Toolkit", OMG Press Wiley Publishing Inc., 2004.

## CS2602 XML AND WEB SERVICES

L T P C  
3 0 0 3

### GOAL

To impart knowledge and training on XML and web services.

### OBJECTIVES

The course should enable the students to:

1. Create a XML application using structure and presentation technologies.
2. Use XML manipulation technologies such as XSLT, XPath, XLink and XQuery.
3. Perform program manipulation and dynamic access through DOM architecture.
4. Develop web services and ensure security.

### OUTCOME

The students should be able to:

1. Apply XML concepts to develop Web application.
2. Create SOAP application using XML and Web Services.
3. Acquire information from the web sites using XML programming.

### UNIT I XML TECHNOLOGY FAMILY

12

XML - benefits - Advantages of XML over HTML - EDL -Databases - XML based standards - DTD -XML Schemas - X- Files - XML processing - DOM -SAX- presentation technologies - XSL - XFORMS - XHTML - voice XML - Transformation - XSLT - XLINK - XPATH -XQ.

### UNIT II ARCHITECTING WEB SERVICES

12

Business motivations for web services - B2B - B2C- Technical motivations - limitations of CORBA and DCOM - Service - oriented Architecture (SOA) - Architecting web services - Implementation view

- web services technology stack - logical view - composition of web services - deployment view - from application server to peer to peer - process view - life in the runtime.

**UNIT III WEB SERVICES BUILDING BLOCK 12**

Transport protocols for web services - messaging with web services - protocols - SOAP - describing web services - WSDL - Anatomy of WSDL - manipulating WSDL - web service policy - Discovering web services - UDDI - Anatomy of UDDI- Web service inspection - Ad-Hoc Discovery - Securing web services.

**UNIT IV IMPLEMENTING XML IN E-BUSINESS 12**

B2B - B2C Applications - Different types of B2B interaction - Components of e-business XML systems - ebXML - Rosetta Net Applied XML in vertical industry - Web services for mobile devices.

**UNIT V XML AND CONTENT MANAGEMENT 12**

Semantic Web - Role of Meta data in web content - Resource Description Framework - RDF schema - Architecture of semantic web - content management workflow - XLANG -WSFL.

**TOTAL: 60**

**TEXT BOOKS**

1. Ron schmelzer et al, "XML and Web Services", Pearson Education, 2002.
2. Sandeep Chatterjee and James Webber, "Developing Enterprise Web Services: An Architect's Guide", Prentice Hall, 2004.

**REFERENCE BOOKS**

1. Frank P. Coyle, "XML, Web Services and the Data Revolution", Pearson Education, 2002.
2. Keith Ballinger, ".NET Web Services Architecture and Implementation", Pearson Education, 2003.
3. Henry Bequet and Meeraj Kunnumpurath, "Beginning Java Web Services", Apress, 2004.
4. Russ Basiura and Mike Batongbacal, "Professional ASP.NET Web Services", Apress,2.

**CS2603 PRINCIPLES OF COMPILER DESIGN**

**L T P C**  
**3 0 0 3**

**GOAL**

To understand, design and implement a lexical analyzer, parser, code generation, and code optimization.

**OBJECTIVES**

The course should be enable the students to:

1. Understand the basic principles of the compiler, compiler construction tools and lexical analysis.
2. Understand the concept of context free grammars, parsing and various parsing techniques.

3. Understand the process of intermediate code generation.
4. Understand the process of Code Generation.
5. Understand various code optimization techniques and runtime environment.

### **OUTCOME**

The students should be able to:

1. Differentiate the various phases of a compiler.
2. Understand parsing techniques and able to write Context Free Grammars for various languages.
3. Understand the structure of intermediate code for various types of statements and expressions.
4. Understand the design of code generator and code optimization techniques.
5. Understand the Data flow of any code.

### **UNIT I INTRODUCTION TO COMPILING 9**

Compilers - Analysis of the source program - Phases of a compiler - Cousins of the Compiler - Grouping of Phases - Compiler construction tools - Lexical Analysis - Role of Lexical Analyzer - Input Buffering - Specification of Tokens.

### **UNIT II SYNTAX ANALYSIS 9**

Role of the parser -Writing Grammars -Context-Free Grammars - Top Down parsing - Recursive Descent Parsing - Predictive Parsing - Bottom-up parsing - Shift Reduce Parsing - Operator Precedent Parsing - LR Parsers - SLR Parser - Canonical LR Parser - LALR Parser.

### **UNIT III INTERMEDIATE CODE GENERATION 9**

Intermediate languages - Declarations - Assignment Statements - Boolean Expressions - Case Statements - Back patching - Procedure calls.

### **UNIT IV CODE GENERATION 9**

Issues in the design of code generator - The target machine - Runtime Storage management - Basic Blocks and Flow Graphs - Next-use Information - A simple Code generator - DAG representation of Basic Blocks - Peephole Optimization.

### **UNIT V CODE OPTIMIZATION AND RUN TIME ENVIRONMENTS 9**

Introduction- Principal Sources of Optimization - Optimization of basic Blocks - Introduction to Global Data Flow Analysis - Runtime Environments - Source Language issues - Storage Organization - Storage Allocation strategies - Access to non-local names - Parameter Passing.

**TOTAL: 45**

### **TEXT BOOK**

1. Alfred Aho, Ravi Sethi, Jeffrey D Ullman, "Compilers Principles, Techniques and Tools", Pearson Education Asia, 2003.

## REFERENCE BOOKS

1. Raghavan V, "Principles of Compiler Design", McGraw Hill, 4th Ed., 2012.
2. Allen I. Holub "Compiler Design in C", Prentice Hall of India, 2003.
3. C.N. Fischer and R.J.LeBlanc, "Crafting a compiler with C", Benjamin Cummings, 2003.
4. J.P.Bennet, "Introduction to Compiler Techniques", 2nd Edition, Tata McGraw-Hill, 2003.
5. Henk Alblas and Albert Nymeyer, "Practice and Principles of Compiler Building with C", Prentice Hall, 2001.
6. Kenneth C. Loudon, "Compiler Construction: Principles and Practice", Thompson Learning, 2003

## CS2604 DISTRIBUTED COMPUTING

L T P C  
3 0 0 3

### GOAL

To provide in-depth knowledge on distributed systems and their applications in real time environment.

### OBJECTIVES

The course should enable the student to:

1. Learn the concepts of distributed systems and understand the issues in it.
2. Understand the concept of RPC and its importance in distributed environment.
3. Study the synchronization and distributed shared systems.
4. Study the distributed file systems and shared memory.

### OUTCOME

The students should be able to:

1. Gain the knowledge of distributed computing system.
2. Understand communication in distributed systems.
3. Learn the synchronization and deadlock in distributed system.
4. Understand process, process models and file system in distributed computing environment.

### UNIT I INTRODUCTION

9

Introduction: Definition of a Distributed System, Goals, Hardware Concepts, Software Concepts, The Client-Server Model. Communication: Remote Procedure Call- Basic RPC Operation, Parameter Passing, Extended RPC Models, Remote Object Invocation - Distributed Objects, Binding a Client to an Object, Static versus Dynamic Remote Method Invocations, Parameter Passing.

### UNIT II MESSAG-ORIENTED COMMUNICATION AND PROCESSES

9

Message-Oriented Communication:-Persistence and Synchronicity in Communication, Message



Oriented Transient and Persistent Communication. Processes:- Threads, Clients, Servers, Code Migration

**UNIT III NAMING 9**

Naming: Naming Entities - Names, Identifiers and Addresses, Name Resolution, Implementation of a Name Space - Locating Mobile Entities, Removing Unreferenced Entities.

**UNIT IV SYNCHRONIZATION AND CONCURRENCY 9**

Synchronization: Clock Synchronization. Logical Clocks, Election Algorithms, Mutual Exclusion. Consistency and Replication: Introduction, Data- Centric Consistency Models, Client -Centric Consistency Models, Distribution Protocols, Consistency Protocols.

**UNIT V FAULT TOLERANCE AND FILE SYSTEM 9**

Fault tolerance:-Introduction to Fault Tolerance, Process Resilience, Reliable Client-Server Communication, Reliable Group Communication, Distributed Commit, Recovery. Distributed File Systems:-Sun Network File System, The Coda File System.

**TOTAL: 45**

**TEXT BOOK**

1. Andrew S.Tanenbaum, Maarten Van Steen "Distributed Systems: Principles and Paradigms", Pearson Education/PHI, 2002.

**REFERENCE BOOKS**

1. Coulouris, Dollimore,Kindberg,"Distributed Systems-Concepts and Design", 3rd Edition, Pearson Education.
2. Mukesh, Singhal & Niranjana G.Shivarathri, "Advanced Concepts in Operating Systems", TMH.
3. Sinha, "Distributed Operating System - Concepts and Design", PHI.

**EC2612 DIGITAL SIGNAL PROCESSING**

**L T P C**  
**3 1 0 4**

**GOAL**

To review signals and systems, study DFT and FFT, discuss the design of IIR & FIR filters and study the applications of digital signal processing.

**OBJECTIVES**

The course should enable the students to:

1. Have an overview of signals and systems.
2. Study DFT & FFT.
3. Study the design of IIR and FIR filters.
4. Study the effect of finite word lengths.
5. Study the real-world applications of DSP.

## OUTCOME

The students should be able to:

1. Understand the concept of Continuous & Discrete time signals & systems, z-transform, convolution.
2. Understand the concept of Discrete & Fast Fourier Transform.
3. To design Butterworth & chebyshev IIR Filter & FIR filter design using windowing technique.
4. To solve the problems in Digital filters.
5. Study the area of DSP Applications.

### UNIT I SIGNALS AND SYSTEMS

9

Basic elements of digital signal Processing - Concept of frequency in continuous time and discrete time signals - Sampling theorem - continuous & Discrete time signals - continuous & Discrete time systems - Analysis of Linear time invariant systems - Z transform (Properties & Problems) - Inverse Z transform - long division method - Convolution - Linear convolution - correlation.

### UNIT II DISCRETE & FAST FOURIER TRANSFORMS

9

Introduction to DFT - Properties of DFT - Efficient computation of DFT- FFT algorithms - Radix-2 algorithm - Decimation in Time - Decimation in Frequency algorithms - Use of FFT algorithms in Linear Filtering and correlation.

### UNIT III IIR AND FIR FILTER DESIGN

9

Structure of IIR - IIR filter design Techniques-Design of Low pass Butterworth & Chebyshev filter - Structure for FIR systems - FIR filter Design using Hamming Windowing technique - Procedure for Kaiser Window technique.

### UNIT IV FINITE WORD LENGTH EFFECTS

9

Representation of numbers in digital systems- Fixed point and binary floating point number representation - comparison - Quantization noise - derivation for quantization noise power - truncation error - co-efficient quantization error - limit cycle oscillation - over flow error - signal scaling - analytical model of sample and hold.

### UNIT V APPLICATIONS OF DSP

9

Multirate signal processing - Speech compression (LPC, CELP, MLEP) - Adaptive filter - Image enhancement - voice over Internet Protocol.

**L : 45, T : 15, TOTAL : 60**

## TEXT BOOKS

1. John G Proakis and Dimtris G Manolakis, "Digital Signal Processing Principles, Algorithms and Application", PHI/Pearson Education, 2007, Fourth Edition.
2. Emmanuel C.Ifeachor & Barrie.W.Jervis,"Digital Sigal Processing"Second Edition,Pearson Education / Prentice Hall,2002

## REFERENCE BOOKS

1. Alan V Oppenheim, Ronald W Schafer and John R Buck, "Discrete Time Signal Processing", PHI/Pearson Education, 2000, 2nd Edition.
2. Johny R.Johnson, "Introduction to Digital Signal Processing", Prentice Hall of India/Pearson Education, 2002.
3. 3.Sanjit K.Mitra, "Digital Signal Processing: A Computer - Based Approach", Tata McGraw Hill,2001,Second Edition.

## CS2631 OOSD LABORATORY

L T P C  
0 0 3 2

## GOAL

To understand and demonstrate the concept in Object Oriented approach to software development.

## OBJECTIVES

The course should enable the students to:

1. Understand the Object oriented life cycle.
2. Know how to identify objects, relationships, Services and attributes through UML.
3. Understand the Use case diagrams.
4. Know about rational suite architecture and its use of converting design to code and code to design .
5. Apply various technique to optimize the design in an oracle environment for performance and maintainability.

## OUTCOME

The students should be able to:

1. Gain well founded knowledge of OOAD.
2. Use UML diagrams.
3. Gain knowledge about object oriented life cycle.
4. Gain a strong knowledge of using rational suites and visual programming languages like VB.
5. Gain knowledge regarding the design in an oracle environment for performance and maintainability.

## LIST OF EXPERIMENTS

Prepare the following documents for the problems listed below and develop the software engineering methodology.

1. Program Analysis and Project Planning: Thorough study of the problem - Identify project scope, Objectives, Infrastructure.

9

2. Software requirement Analysis: Describe the individual Phases / Modules of the project, Identify deliverables. 9
3. Data Modeling: Use work products - Data dictionary, Use diagrams and activity diagrams, build and test class diagrams, Sequence diagrams and add interface to class diagrams. 9
4. Software Development and Debugging. 9
5. Software Testing: Prepare test plan, perform validation testing, Coverage analysis, memory leaks, develop test case hierarchy, Site check and Site monitor. 9

#### **SUGGESTED LIST OF APPLICATIONS**

1. Student Marks Analyzing System
2. Quiz System
3. Online Ticket Reservation System
4. Financial Accounting System
5. Course Registration System
6. Expert Systems
7. ATM Systems
8. Stock Maintenance
9. Real-Time Scheduler
10. Remote Procedure Call Implementation

#### **CS2632 XML AND WEB SERVICES LABORATORY**

**L T P C**  
**0 0 4 2**

#### **GOAL**

To design and implement component services using XML and Web Services technologies.

#### **OBJECTIVES**

To understand design of web applications using XML and web services.

#### **OUTCOME**

The students should develop and deploy web applications using XML and have exposure to web services.

#### **LIST OF EXPERIMENTS**

1. Create an XML document to store an address book. 6
2. Create an XML document to store information about books and create the DTD files. 6
3. Create an XML schema for the book's XML document from exercise 2. 6
4. Create an XML document to store resumes for a job web site and create the DTD file 6

- |     |   |   |
|-----|---|---|
| 5.  | Present the book's XML document using cascading style sheets (CSS).   | 6 |
| 6.  | Write an XSLT program to extract book titles, authors, publications, book rating from the book's XML document and use formatting. | 6 |
| 7.  | Use Microsoft DOM to navigate and extract information from the book's XML document.   | 6 |
| 8.  | Use Microsoft DSO to connect HTML form or VB form to the book's XML document and display the information.                         | 6 |
| 9.  | Create a web service for temperature conversion with appropriate client program.  | 6 |
| 10. | Create a web service for currency conversion (at five currencies) with appropriate client program.                                | 6 |

### CS2633 COMPILER DESIGN LABORATORY

**L T P C**  
**0 0 3 2**

#### GOAL

To design and develop each and every phase of a compiler.

#### OBJECTIVES

To understand, design and implement lexical analyzer, parser, code generation, and code optimization.

#### OUTCOME

The students should implement various phases of compiler in C language.

#### LIST OF EXPERIMENTS

- |    |   |   |
|----|---|---|
| 1. | Implement a lexical analyzer in "C".  | 7 |
| 2. | Use LEX tool to implement a lexical analyzer.   | 6 |
| 3. | Implement a recursive descent parser for an expression grammar that generates arithmetic expressions with digits, + and *.  | 7 |
| 4. | Use YACC and LEX to implement a parser for the same grammar as given in problem 7   |   |
| 5. | Write semantic rules to the YACC program in problem 5 and implement a calculator that takes an expression with digits, + and * and computes and prints its value.   | 6 |
| 6. | Implement the front end of a compiler that generates the three address code for a simple language with: one data type integer, arithmetic operators, relational operators, variable declaration statement, one conditional construct, one iterative construct and assignment statement.   | 6 |
| 7. | Implement the back end of the compiler which takes the three address code generated in problems 7 and 8, and produces the 8086 assembly language instructions that can be assembled and run using a 8086 assembler. The target assembly instructions can be simple move, add, sub, jump. Also simple addressing modes are used. | 6 |

## EL2431 COMMUNICATION SKILLS & PERSONALITY DEVELOPMENT

L T P C  
2 0 2 3

### GOAL

The goal of the programme is to provide the learners with the methods and materials required for becoming accomplished personalities through the medium of English.

### OBJECTIVES

The course should enable the students to:

1. Be aware of self-knowledge by exposure to soft skills, values, behaviour, attitudes, temperamental changes, and a positive attitude to life.
2. Learn personality traits and undergo personality tests to determine their own personality characteristics and the scope for improvement.
3. Cultivate the art of speaking fluently making use of proper gestures, tone and voice modulation, adding humour to the speech.
4. Figure out the need to work in teams, adorn or accept team leadership, and make use of body language to enhance team spirit.
5. Be familiar with the art of managing self, people, work and time, keeping in mind problems like time-wasters and stress-builders.

### OUTCOME

The students should be able to:

1. Apply the knowledge gained to improve upon their values, behaviour, attitude, and develop the soft skills required for home, workplace and the society.
2. Employ the concept of personality traits and build up an accomplished personality that would be pleasing to people around so as to influence them positively.
3. Develop a personal style and communicate fearlessly and effectively in a convincing manner so as to impress listeners or the audience.
4. Participate in presentations, group discussions, debates and mock interviews making good use of language skills and interpersonal relationships.
5. Comprehend stress-management tips to overcome stress-prone habits and develop a career plan with personal, familial and societal goals for success.

### UNIT I

20

Values and attitudes - Value-formation - Values & education - Terminal & Instrumental values - Civic responsibilities - The power of Personal/ Cultural/ Social values -- Behaviour and attitudes -- Features of attitudes - Developing positive attitude - Overcoming negative attitude -- People skills - Soft skills as per the Work Force Profile - The four temperaments - Sanguine - Choleric - Melancholic - Phlegmatic -- Tests for Personal Chemistry.

**UNIT II****20**

What is personality development? - Types of personalities as per (i) Heredity (ii) Environment (iii) Situation - the 16 personality factors - MBTI Tests - Personality types - Increasing self awareness: Assessing one's locus of control, Machiavellianism, self-esteem, self-monitoring, risk-taking, Type A, Type B personality elements - Intellectual and physical abilities for jobs -- Personality tests.

**UNIT III****20**

Developing the art of speaking - How to get rid of stage fright? - Enhancing fluency - Modulating voice - Enunciation - Positive and negative gestures - Preparation - How to begin? - How to convince the listeners? - How to wind up the speech? - Adding humour and illustration - Developing one's own style - Types of style - How to influence the audience? - How to become an effective speaker? -- Tests for effective speaking.

**UNIT IV****20**

Team work - Team building - Team leadership -- How to face an interview? -- How to participate in a group discussion? - How to argue for or against in a debate? - Body language - non-verbal communication - personal appearance - facial expression - posture - gestures - eye contact - Etiquette - Voluntary and involuntary body language - Gender implications -- Tests.

**UNIT V****20**

Managing self, people, work, situations - Time-management - Secrets of time-management - Time-wasters - Stress -- Kinds of stress - Spotting stress - Stress-builders - Stress -management tips - Stress-prone habits -- Goals - Career planning - Interpersonal interaction - Interpersonal relationships -- Tests.

**NOTE:**

**Study material will be prepared by the Department of Languages.**

**Tests suggested will be prepared by a senior faculty of the department.**

**Movies will be screened to discuss and debate on the topics introduced in each unit.**

**Laboratory Requirements:**

1. Career Lab:1 room
2. 2 Computers as a Server for Labs (with High Configuration)
3. Headphones with Mic (i-ball) - 100 Nos
4. Speakers with Amplifiers, Wireless Mic and Collar Mic - 2 Sets
5. Teacher table, Teacher Chair - 1 + 1
6. Plastic Chairs - 75 Nos

## SEMESTER VII

### CS2701 ARTIFICIAL INTELLIGENCE

L	T	P	C
3	0	0	3

#### GOAL

To provide the basic exposition to goals and methods of Artificial Intelligence

#### OBJECTIVES

The course should enable the student to:

1. Understand the representation of agents and agent environments.
2. Understand the searching techniques
3. Know the knowledge representation and learning
4. Enable the students to apply these techniques in application which involve perception, reasoning and learning
5. Know the features of expert systems

#### OUTCOME

The students should be able to:

1. Develop a basic understanding of the building blocks of AI
2. Understand the main approaches to artificial intelligence such as heuristic search, game and search.
3. Understand machine learning, neural networks and natural language processing.
4. Recognize problems that may be solved using artificial intelligence and implement artificial intelligence algorithms for hands-on experience.
5. Develop expert systems for an application.

#### UNIT I INTRODUCTION

8

Intelligent Agents - Agents and environments - Good behavior - The nature of environments - structure of agents - Problem Solving - problem solving agents - example problems - searching for solutions - uniformed search strategies - avoiding repeated states - searching with partial information.

#### UNIT II SEARCHING TECHNIQUES

10

Informed search and exploration - Informed search strategies - heuristic function - local search algorithms and optimistic problems - local search in continuous spaces - online search agents and unknown environments - Constraint satisfaction problems (CSP) - Backtracking search and Local search for CSP - Structure of problems - Adversarial Search - Games - Optimal decisions in games - Alpha - Beta Pruning - imperfect real-time decision - games that include an element of chance.



### **UNIT III KNOWLEDGE REPRESENTATION AND LEARNING**

**10**

First order logic - representation revisited - Syntax and semantics for first order logic - Using first order logic - Knowledge engineering in first order logic - Inference in First order logic - prepositional versus first order logic - unification and lifting - forward chaining - backward chaining - Resolution - Knowledge representation - Ontological Engineering - Categories and objects - Actions - Simulation and events - Mental events and mental objects - Learning from observations - forms of learning - Inductive learning - Learning decision trees - Ensemble learning - Knowledge in learning - Logical formulation of learning - Explanation based learning - Learning using relevant information - Inductive logic programming - Statistical learning methods - Learning with complete data - Learning with hidden variable - EM algorithm - Instance based learning - Neural networks - Reinforcement learning - Passive reinforcement learning - Active reinforcement learning - Generalization in reinforcement learning.

### **UNIT IV APPLICATIONS**

**9**

Communication - Communication as action - Formal grammar for a fragment of English - Syntactic analysis - Augmented grammars - Semantic interpretation - Ambiguity and disambiguation - Discourse understanding - Grammar induction - Probabilistic language processing - Probabilistic language models - Information retrieval - Information Extraction - Machine translation.

### **UNIT V EXPERT SYSTEM**

**8**

Definition - Features of an expert system - Organization - Characteristics - Prospector - Knowledge Representation in expert systems - Expert system tools - MYCIN - EMYCIN.

**TOTAL: 45**

### **TEXT BOOKS**

1. Stuart Russell, Peter Norvig, "Artificial Intelligence - A Modern Approach", 2nd Edition, Pearson Education / Prentice Hall of India, 2004.
2. Donald A. Waterman, 'A Guide to Expert Systems', Pearson Education.

### **REFERENCE BOOKS**

1. Nils J. Nilsson, "Artificial Intelligence: A new Synthesis", Harcourt Asia Pvt. Ltd., 2000.
2. Elaine Rich and Kevin Knight, "Artificial Intelligence", 2nd Edition, Tata McGraw-Hill, 2003.
3. George F. Luger, "Artificial Intelligence-Structures And Strategies For Complex Problem Solving", Pearson Education / PHI, 2002.
4. Janakiraman, K. Sarukesi, 'Foundations of Artificial Intelligence and Expert Systems', Macmillan Series in Computer Science.
5. W. Patterson, 'Introduction to Artificial Intelligence and Expert Systems', Prentice Hall of India, 2003.

## CS2702 GRAPHICS AND MULTIMEDIA

L T P C  
4 0 0 4

### GOAL

To provide the fundamental knowledge to develop interactive graphics and handling multimedia devices.

### OBJECTIVES

The course should enable the students to:

1. Apply the rules and algorithms in generating graphical outputs.
2. Develop 3-dimensional objects using suitable transformations.
3. Adapt the architecture for design of multimedia system.
4. Solve issues related to multimedia file handling.
5. Adopt hypermedia standards in developing multimedia applications.

### OUTCOME

The students should able to:

1. Draw figures using fundamental algorithms
2. Develop real-time rendering graphics
3. Create 2D and 3D images
4. Know the basics of creating multimedia applications

### UNIT I OUTPUT PRIMITIVES

9

Introduction - Line - Curve and Ellipse Drawing Algorithms - Attributes - Two-Dimensional Geometric Transformations - Two-Dimensional Clipping and Viewing.

### UNIT II THREE-DIMENSIONAL CONCEPTS

9

Three-Dimensional Object Representations - Three-Dimensional Geometric and Modeling Transformations - Three-Dimensional Viewing - Color models - Animation.

### UNIT III MULTIMEDIA SYSTEMS DESIGN

9

An Introduction - Multimedia applications - Multimedia System Architecture - Evolving technologies for Multimedia - Defining objects for Multimedia systems - Multimedia Data interface standards - Multimedia Databases.

### UNIT IV MULTIMEDIA FILE HANDLING

9

Compression & Decompression - Data & File Format standards - Multimedia I/O technologies - Digital voice and audio - Video image and animation - Full motion video - Storage and retrieval Technologies.

### UNIT V HYPERMEDIA

9

Multimedia Authoring & User Interface - Hypermedia messaging - Mobile Messaging - Hypermedia

message component - Creating Hypermedia message - Integrated multimedia message standards - Integrated Document management - Distributed Multimedia Systems.

**TOTAL: 45**

#### **TEXT BOOKS**

1. Donald Hearn and M.Pauline Baker, "Computer Graphics C Version", Pearson Education, 2003.
2. Prabat K Andleigh and Kiran Thakrar, "Multimedia Systems and Design", PHI, 2003 .

#### **REFERENCE BOOKS**

1. Judith Jeffcoate, "Multimedia in practice technology and Applications", PHI, 1998.
2. Foley, Vandam, Feiner, Huges, "Computer Graphics: Principles & Practice", Pearson Education, second edition 2003.

### **GE2001 PROFESSIONAL ETHICS AND HUMAN VALUES**

**L T P C**  
**3 0 0 3**

#### **GOAL**

To introduce the students to basic concepts of Engineering Ethics and Human Values.

#### **OBJECTIVES**

The course should enable the students to:

1. Create an awareness on Human Values.
2. Be familiar with the various theories on Engineering Ethics.
3. Throw light on moral social values and Loyalty of professional.
4. Create an awareness about the safety aspects, responsibilities and various rights of professionals.

#### **OUTCOME**

The students should able to:

1. Gain knowledge in Human values.
2. Use the senses of Engineering Ethics and ethical theories.
3. Be acquainted with the Global issues on Environmental Ethics and Computer Ethics.
4. Get awareness on the Ethics and responsibilities of a professional.
5. Get awareness on Engineering Ethics and Human Values.

#### **UNIT I HUMAN VALUES**

**10**

Morals, Values and Ethics - Integrity - Work Ethic - Service Learning - Civic Virtue - Respect for Others - Living Peacefully - caring - Sharing - Honesty - Courage - Valuing Time - Co-operation - Commitment - Empathy - Self-Confidence - Character - Spirituality.

**UNIT II ENGINEERING ETHICS****9**

Senses of 'Engineering Ethics' - variety of moral issues - types of inquiry - moral dilemmas - moral autonomy - Kohlberg's theory - Gilligan's theory - consensus and controversy - Models of Professional Roles - theories about right action - Self-interest - customs and religion - uses of ethical theories.

**UNIT III ENGINEERING AS SOCIAL EXPERIMENTATION****9**

Engineering as experimentation - engineers as responsible experimenters - codes of ethics - a balanced outlook on law - the challenger case study.

**UNIT IV SAFETY, RESPONSIBILITIES AND RIGHTS****9**

Safety and risk - assessment of safety and risk - risk benefit analysis and reducing risk - the three mile island and chernobyl case studies. Collegiality and loyalty - respect for authority - collective bargaining - confidentiality - conflicts of interest - occupational crime - professional rights - employee rights - Intellectual Property Rights (IPR) - discrimination.

**UNIT V GLOBAL ISSUES****8**

Multinational corporations - Environmental ethics - computer ethics - weapons development - engineers as managers-consulting engineers-engineers as expert witnesses and advisors -moral leadership-sample code of Ethics like ASME, ASCE, IEEE, Institution of Engineers (India), Indian Institute of Materials Management, Institution of electronics and telecommunication engineers (IETE), India, etc.

**TOTAL: 45****TEXT BOOKS**

1. Mike Martin and Roland Schinzinger, "Ethics in engineering", McGraw-Hill, 1996.
2. Govindarajan M, Natarajan S, Senthil Kumar V. S, "Engineering Ethics", Prentice Hall of India, New Delhi, 2004.

**REFERENCE BOOKS**

1. Charles D. Fleddermann, "Engineering Ethics", Pearson Education, 2004.
2. Charles E Harris, Michael S. Protchard and Michael J Rabins, "Engineering Ethics - Concepts and Cases", Wadsworth Thompson Learning, United States, 2000.
3. John R Boatright, "Ethics and the Conduct of Business", Pearson Education, 2003.
4. Edmund G Seebauer and Robert L Barry, "Fundamentals of Ethics for Scientists and Engineers", Oxford University Press, Oxford, 2001.

## MG2001 PRINCIPLES OF MANAGEMENT

L T P C  
3 0 0 3

### GOAL

To make the students to understand the different managerial functions like planning, organizing, staffing, leading and controlling .

### OBJECTIVES

The course should enable the students to:

1. Learn the historical development of organizations.
2. Understand the various steps involved in planning.
3. Understand the Structure and Process involved in formal and informal organization.
4. Impart knowledge on the principles of leadership and human factors.
5. Impart knowledge on System and process of Controlling.

### OUTCOME

The students should be able to:

1. Visualize the development of various business organizations.
2. Get acquainted with steps involved in planning.
3. Gain knowledge in departmentation by different strategies.
4. Get acquainted with different motivation techniques.
5. Describe the various issues on process control.

### UNIT I HISTORICAL DEVELOPMENT

9

Definition of Management - Science or Art - Management and Administration - Development of Management Thought - Contribution of Taylor and Fayol - Functions of Management - Types of Business Organisation.

### UNIT II PLANNING

9

Nature & Purpose - Steps involved in Planning - Objectives - Setting Objectives - Process of Managing by Objectives - Strategies, Policies & Planning Premises- Forecasting - Decision-making.

### UNIT III ORGANISING

9

Nature and Purpose - Formal and informal organization - Organization Chart - Structure and Process - Departmentation by difference strategies - Line and Staff authority - Benefits and Limitations - De-Centralization and Delegation of Authority - Staffing - Selection Process - Techniques - HRD - Managerial Effectiveness.

### UNIT IV DIRECTING

9

Scope - Human Factors - Creativity and Innovation - Harmonizing Objectives - Leadership - Types of Leadership Motivation - Hierarchy of needs - Motivation theories - Motivational Techniques - Job

Enrichment - Communication - Process of Communication - Barriers and Breakdown - Effective Communication - Electronic media in Communication.

#### **UNIT V CONTROLLING**

**9**

System and process of Controlling - Requirements for effective control - The Budget as Control Technique - Information Technology in Controlling - Use of computers in handling the information - Productivity - Problems and Management - Control of Overall Performance - Direct and Preventive Control - Reporting - The Global Environment - Globalization and Liberalization - International Management and Global theory of Management.

**TOTAL: 45**

#### **TEXT BOOKS**

1. G.K. Vijaya Raghavan, M.Sivakumar, Principles of Management, Lakshmi Pub., 2010.
2. M. Govindarajan, S. Natarajan, Principles Of Management, Prentice Hall of India, 2005.
3. Harold Kooritz & Heinz Wehrich "Essentials of Management", Tata McGraw-Hill, 1998.
4. Joseph L Massie "Essentials of Management", Prentice Hall of India, 4th Edition, 2003.

#### **REFERENCE BOOKS**

1. Tripathy PC and Reddy PN, "Principles of Management", Tata McGraw-Hill, 1999.
2. Decenzo David, Robbin Stephen A, "Personnel and Human Reasons Management", Prentice Hall of India, 1996
3. JAF Stomer, Freeman R. E and Daniel R Gilbert Management, Pearson Education, Sixth Edition, 2004.
4. Fraidoon Mazda, "Engineering Management", Addison Wesley, 2000.

#### **CS2731 COMPUTER GRAPHICS LABORATORY**

**L T P C**  
**0 0 3 2**

#### **GOAL**

To understand and demonstrate the basic concepts of computer graphics.

#### **OBJECTIVES**

The course should enable the students to:

1. Apply the algorithms in generating graphical outputs.
2. Develop 3-dimensional objects using suitable transformations.
3. Write program to convert colour from RGB to CMY
4. Know the compression technique to reduce the file size
5. Foster poster design and animation skills.

## OUTCOME

The students should be able to:

1. Draw using basic built-in function.
2. Develop real-time rendering graphics using 2D and 3D.
3. Select portion of image using clipping algorithm.
4. Compress file and image.
5. Design a poster using image editing software and create an animation video.

## LIST OF EXPERIMENTS

- |     |  |   |
|-----|--|---|
| 1.  | To implement Bresenham's algorithms for line, circle and ellipse drawing.                      | 5 |
| 2.  | To perform 2D Transformations such as translation, rotation, scaling, reflection and shearing. | 4 |
| 3.  | To implement Cohen-Sutherland 2D clipping and window-viewport mapping.                         | 4 |
| 4.  | To perform 3D Transformations such as translation, rotation and scaling.                       | 5 |
| 5.  | To visualize projections of 3D images.   | 4 |
| 6.  | To convert between color models.   | 4 |
| 7.  | To implement text compression algorithm.   | 4 |
| 8.  | To implement image compression algorithm.  | 5 |
| 9.  | To perform animation using any Animation software.   | 5 |
| 10. | To perform basic operations on image using any image editing software.                         | 5 |

## SEMESTER VIII

### CS2801 MOBILE COMPUTING

L T P C  
4 0 0 4

#### GOAL

To impart knowledge on various aspects of mobile computing

#### OBJECTIVES

The course should enable the students to:

1. Learn mobile computing architecture.
2. Learn various mobile technologies.
3. Learn GPRS and WAP technologies.
4. Learn Wireless LAN technology.
5. Learn platforms for Mobile Application development.

#### OUTCOME

The students should be able to:

1. Understand the various mobile architectures.
2. Understand various messaging environment in mobile environments.
3. Acquire knowledge to develop mobile applications under PALM and SYMBIAN OSs.
4. Write mobile applications using J2ME.

#### UNIT I INTRODUCTION

12

Introduction: Mobility of Bits and Bytes - Wireless-The Beginning - Mobile Computing - Dialogue Control- Networks - Middleware and Gateways - Application and Services (Contents) - Developing Mobile Computing Applications- Security in Mobile Computing - Standards-Why is it Necessary? - Standard Bodies - Players in the Wireless Space.

Mobile Computing Architecture: Internet-The Ubiquitous Network - Architecture for Mobile Computing - Three-Tier Architecture - Design Considerations for Mobile Computing - Mobile Computing through Internet - Making Existing Applications Mobile-Enabled.

#### UNIT II MOBILE COMPUTING THROUGH TELEPHONY

12

Mobile Computing Through Telephony: Evolution of Telephony - Multiple Access Procedures - Mobile Computing through Telephone - Developing an IVR Application - Voice XML - Telephony Application Programming Interface (TAPI).

Emerging Technologies: Introduction - Bluetooth - Radio Frequency Identification (RFID), WiMAX - Mobile IP - IPv6 - Java Card.



Global System for Mobile Communications (GSM): GSM Architecture - Entities - Call Routing in GSM -PLMN Interfaces - GSM Addresses and Identifiers - Network Aspects in GSM - GSM Frequency Allocation -Authentication and Security.

**UNIT III SMS, GPRS AND WAP**

**12**

Short Message Service (SMS): Mobile Computing over SMS - SMS - Value Added Services through SMS -Accessing the SMS Bearer.

GPRS: Packet Data Network - Network Architecture - Network Operations - Data Services in GPRS -Applications for GPRS - Limitations - Billing and Charging.

Wireless Application Protocol (WAP): Introduction - WAP - MMS - GPRS Applications.

**UNIT IV 3G AND OTHER TECHNOLOGIES**

**12**

CDMA and 3G: Introduction - Spread-Spectrum Technology - IS-95 - CDMA Vs GSM - Wireless Data - 3G Networks & Applications.

Wireless LAN: Introduction - Advantages - IEEE 802.11 Standards - Architecture - Mobility - Deploying -Mobile Ad Hoc Networks and Sensor Networks - Wireless LAN Security - WiFi Vs 3G.

Internet Networks and Interworking: Introduction - Fundamentals of Call Processing - Intelligence in the Networks - SS#7 Signaling - IN Conceptual Model - Softswitch - Programmable Networks - Technologies and Interfaces for IN.

Client Programming: Introduction - Moving Beyond the Desktop - A Peek under the Hood: Hardware Overview - Mobile Phones - PDA - Design Constraints in Applications for Handheld Devices.

**UNIT V MOBILE APPLICATION PLATFORMS**

**12**

Wireless Devices with SYMBIAN OS: Introduction - Symbian OS Architecture - Applications for Symbian - Control and Compound Controls - Active Objects - Localization - Security on the Symbian OS.

Programming for the Android OS: Introduction - Android Architecture - Application Development.

J2ME: JAVA in the Handset - Three-Prong Approach to Java Everywhere, Java 2 Micro Edition (J2ME) -Programming for CLDC - GUI in MIDP - UI Design Issues - Multimedia - Record Management System -Communication in MIDP - Security Considerations in MIDP - Optional Packages

**TOTAL: 60**

**TEXT BOOK**

1. Asoke K Talukder & Roopa R.Yavagal, "Mobile Computing - Technology Applications and Service Creation", TMH 2006.

**REFERENCE BOOKS**

1. Uwe Hansmann, Lothar Merk, Martin S.Nicklous, Thomas Staber, "Principles of Computing", 2/e, Springer International Edition.
2. J.Schiller, "Mobile communications", Addison-Wesley, 2003.

## ELECTIVE - I (SEMESTER VI)

### CS2651 DATA MINING AND WAREHOUSING

L T P C  
4 0 0 4

#### GOAL

To understand the fundamentals of data mining functionalities and its application in various business and social domains.

#### OBJECTIVES

The course should enable the student to :

1. Understand the fundamentals of data mining and its functionalities
2. Obtain knowledge in different data mining techniques and algorithms
3. Discuss about various application domains of data mining

#### OUTCOME

The students should be able to:

1. Understand the concepts of data mining and data warehousing concepts and techniques.
2. Work with data mining tools.

#### UNIT I INTRODUCTION

12

Data Mining Tasks, Data mining Issues, Decision Support System, Dimensional Modeling, Data warehousing, OLAP & its tools, OLTP.

#### UNIT II MINING TECHNIQUES: CLASSIFICATION

12

Introduction, statistical Perspective of data mining, Decision tree, Neural networks, Genetic algorithms, Issues in classification, Statistical based algorithm(regression), Distance based algorithm(simple approach), Decision Tree based algorithm(C4.5), Neural network based (propagation).

#### UNIT III MINING TECHNIQUES : CLUSTERING AND ASSOCIATION RULES

12

Introduction to clustering, Similarity and distance measures, Hierarchical algorithm(divisive clustering), partitional algorithm (Minimum Spanning tree, nearest neighbour), Clustering large database(CURE), Introduction to association, basic algorithm(Apriori), parallel & distributed(data parallelism), Incremental rules, Association rule techniques(Generalized, multiple level)

#### UNIT IV ADVANCED MINING

12

Web mining, Web content mining, Introduction to Spatial mining & its primitives, spatial classification algorithm (ID3 extension), Spatial clustering algorithm (SD), Introduction to temporal mining, Time series, Temporal association rule.

## UNIT V DATA MINING ENVIRONMENT

12

Case study in building business environment, Application of data mining in Government National data warehouse and case studies.

**TOTAL: 60**

### TEXT BOOKS

1. Margaret H. Dunham, S. Sridhar "Data Mining Introductory & Advance Topics" - 2006(Unit - 1,2,3,4)
2. C.S.R. Prabhu, "Data Warehousing: Concept, Techniques, Products and Applications", Prentice Hall of India, 2001 (Unit-5).

### REFERENCE BOOKS

1. J.Han, M.Kamber, "Data Mining: Concept and Techniques", Academic Press, Morgan Kanfman Publishers, 3rd Edition, 2008.
2. Alex Berson and Stephen J. Smith "Data Warehousing, Data Mining & OLAP", Tata McGraw Hill, 2007.
3. Pieter Adrians, Dolf Zantinge, "Data Mining", Addison Wesley, 2000.

## CS2752 SYSTEM MODELLING AND SIMULATION

L T P C  
4 0 0 4

### GOAL

To build knowledge on system modelling and system study on various applications

### OBJECTIVES

The course should enable the students to:

1. Provide a strong foundation on concept of simulation and modelling.
2. Understand the techniques of random number generations.
3. Understand the techniques of testing randomness.
4. Design simulation models for various case studies like Manufacturing and Material Handling Simulations.
5. Practice on simulation tools and impart knowledge on building simulation systems.

### OUTCOME

The students should be able to:

1. Gain strong foundation on simulation and modelling.
2. Understand the techniques of generation of random number.
3. Understand the simulation models for case studies manufacturing case studies and material handling simulations, inventory systems using simulation languages.

4. Build simulation systems with impart knowledge.

**UNIT I INTRODUCTION TO SIMULATION, EXAMPLES, PRINCIPLES AND SOFTWARE 12**

Introduction: System and System environment, Components of system, Type of systems, Type of models, Steps in simulation study, Advantages and Disadvantages of simulation. Examples: Simulation of Queuing systems, Other examples of simulation. General Principles: Concepts of discrete event simulation, List processing. Simulation Software: History of simulation software, Desirable software features, General-purpose simulation packages, Object oriented simulation, Trends in simulation software.

**UNIT II STATISTICAL AND QUEUING MODELS IN SIMULATION 12**

Statistical Models: Useful statistical model, Discrete distribution, Continuous distribution, Poisson process, Empirical distribution. Queuing Models: Characteristics of Queuing systems, Queuing notations, Long run measures of performance of Queuing systems, Steady state behaviour of infinite population Markovian models, Steady state behaviour finite population model, Network of Queues.

**UNIT III RANDOM NUMBER AND VARIATE GENERATION 12**

Random Number: Properties of random numbers, Generation of pseudo random numbers, Techniques for generating random numbers, Tests for random numbers. Random Variate Generation: Inverse transforms technique, Convolution method, Acceptance rejection techniques.

**UNIT IV INPUT MODELLING AND VERIFICATION AND VALIDATION OF SIMULATION MODEL 12**

Input Modelling: Data Collection, Identifying the Distribution of data, Parameter estimation, Goodness of fit tests, Selection input model without data, Multivariate and Time series input models. Verification and Validation of Simulation Model: Model building, Verification, and Validation, Verification of simulation models, Calibration and Validation of models.

**UNIT V OUTPUT ANALYSIS FOR A SINGLE MODEL, COMPARISON AND EVALUATION OF ALTERNATIVE SYSTEM DESIGN AND CASE STUDIES 12**

Output Analysis for a Single Model: Types of simulations with respect to output analysis, stochastic nature of output data, Measure of performance and their estimation, Output analysis of terminating simulators, Output analysis for steady state simulation. Comparison and Evaluation of Alternative System Design: Comparison of two system design, Comparison of several system design, Meta modelling, Optimization via simulation. Case Studies: Simulation of manufacturing systems, Simulation of computer systems, Simulation of super market, Simulation of pert network.

**TOTAL: 60**

**REFERENCE BOOKS**

1. Jerry Banks, John Carson, Barry Nelson, David Nicol, "Discrete Event System Simulation", 5th Edition, Prentice Hall, 2009.
2. Averill Law, W. David Kelton, "Simulation Modelling and Analysis", 3rd Edition, McGraw Hill, 2000.

3. Geffery Gordon, "System Simulation", 2nd Edition, Prentice Hall, 1978.
4. Bernard Zeigler, Herbert Praehofer, Tag Gon Kim, "Theory of Modeling and Simulation", 2nd Edition, Academic Press, 2000.
5. Narsing Deo, "System Simulation with Digital Computer", Prentice Hall, 2004.
6. Donald W. Body, "System Analysis and Modeling", Academic Press, 2000.
7. W David Kelton, Randall Sadowski, Deborah Sadowski, "Simulation with Arena", 5th Edition, McGraw Hill, 2009.

### **CS2653 LINUX INTERNALS**

**L T P C**  
**3 1 0 4**

#### **GOAL**

To provide full understanding of LINUX administration in both Server and client environments.

#### **OBJECTIVES**

The course should enable the students to:

1. Provide a general introduction to linux server.
2. Impart knowledge on user administration, internet services and intranet services.
3. Give an introduction to process and shell programming.

#### **OUTCOME**

The students should be able to:

1. Install LINUX OS.
2. Manage the user accounts.
3. Setup environment for internet and intranet services.
4. Write Shell Programming for various functionalities required for the applications.

#### **UNIT I INSTALLING LINUX AS A SERVER**

**12**

History of Linux operating system - Difference between windows 2000 and Linux distribution - Installing Linux in a server configuration - Dual booting issues - methods of installation - GNOME and KDE - Xwindows system - KDE Basics - Installing software.

#### **UNIT II SINGLE - HOST ADMINISTRATION**

**12**

Managing users - User properties - user database - utilize user management tools setUID & getUID -Command Line - Booting and Shutting down -Boot loaders, GRUB, Bootstrapping - File System - CoreSystem services - Compiling Linux kernel Securing an individual server.

#### **UNIT III INTERNET SERVICES**

**12**

Internet Services - understanding naming services - BIND configuration file and database file - DNS -

FTP -Setting up web server using Apache - SMTP - Install, configure and run postfix server -POP - conflicts between pop and other protocols- SSH public key Cryptography - creating a secure tunnel.

#### **UNIT IV INTRANET SERVICES**

**12**

Intranet Services - NFS - enable and configure NFS server and client - NIS - configure NIS Client - setupsecondary NIS server - NIS tools - SAMBA - Administrating samba Printing - Install cups - add and manageprint jobs - DHCP network configuration configure network interfaces - use routers.

#### **UNIT V LINUX PROCESS CONTROL & SHELL PROGRAMMING**

**12**

Linux process environment - login process - parent child relationship - process variable process monitoring -invoking foreground and background process - terminating process Daemons -Introduction to Shell programming - Shell scripts - executing shell scripts creating scripts - simple examples.

**TOTAL : 60**

#### **TEXT BOOK**

1. Steven Graham, Steve Shah , "Linux Administration A Beginners Guide" ,3rd edition, Dreamtech press ,2003.

#### **REFERENCE BOOKS**

1. McKinnon,McKinnon, "Installing and Administrating Linux ", 2nd edition,Wiley Dreamtech, 2002
2. Sandip Bhattacharya, Panancrazio De Mauro,ShishirGundavaram, Mark Mamone,Kapil Sharma, Deepak Thomas,Simon Whiting "Beginning Red Hat Linux 9 ", 5th edition , Wiley Dreamtech. ,2003
3. Christopher Negus , "Red Hat Linux 9 Bible ", Wiley Dreamtech India Pvt Ltd.2002.

### **CS2654 CRYPTOGRAPHY AND NETWORK SECURITY**

**L T P C**  
**3 1 0 4**

#### **GOAL**

To understand the principles of encryption algorithms, conventional and public key cryptography, detailed knowledge of authentication, hash functions and application level security mechanisms.

#### **OBJECTIVES**

The course should enable the students to:

1. Know the methods of conventional encryption
2. Understand the concepts of public key encryption and number theory.
3. Understand authentication and Hash Functions.
4. Know the network security tools and application.
5. Understand the system level security used.

## OUTCOME

The students should be able to:

1. Identify and classify computer and security threats and develop a security model to prevent, detect and recover from attacks.
2. Encrypt and decrypt messages using block ciphers.
3. Demonstrate techniques to Sign and verify messages using well-known signature generation and verification algorithms.
4. Develop code to implement a cryptographic algorithm or write an analysis report on any existing security product.
5. Understand and demonstrate the technologies to protect cipher space against security threats.

### UNIT I INTRODUCTION

12

OSI Security Architecture - Classical Encryption techniques - Cipher Principles - Data Encryption Standard - Block Cipher Design Principles and Modes of Operation - Evaluation criteria for AES - AES Cipher - Triple DES - Placement of Encryption Function - Traffic Confidentiality

### UNIT II PUBLIC KEY CRYPTOGRAPHY

12

Key Management - Diffie-Hellman key Exchange - Elliptic Curve Architecture and Cryptography - Introduction to Number Theory - Confidentiality using Symmetric Encryption - Public Key Cryptography and RSA.

### UNIT III AUTHENTICATION AND HASH FUNCTION

12

Authentication requirements - Authentication functions - Message Authentication Codes - Hash Functions - Security of Hash Functions and MACs - MD5 message Digest algorithm - Secure Hash Algorithm - RIPEMD - HMAC Digital Signatures - Authentication Protocols - Digital Signature Standard.

### UNIT IV NETWORK SECURITY

12

Authentication Applications: Kerberos - X.509 Authentication Service - Electronic Mail Security - PGP - S/MIME - IP Security - Web Security.

### UNIT V SYSTEM LEVEL SECURITY

12

Intrusion detection - password management - Viruses and related Threats - Virus Counter measures - Firewall Design Principles - Trusted Systems.

**TOTAL: 60**

## TEXT BOOK

1. William Stallings, "Cryptography And Network Security - Principles and Practices", Prentice Hall of India, Third Edition, 2003

## REFERENCE BOOKS

1. Atul Kahate, "Cryptography and Network Security", Tata McGraw-Hill, 2003.
2. Bruce Schneier, "Applied Cryptography", John Wiley & Sons Inc, 2001.

3. Charles B. Pfleeger, Shari Lawrence Pfleeger, "Security in Computing", Third Edition, Pearson Education, 2003.

### MA2401 NUMERICAL METHODS

L T P C  
3 1 0 4

#### GOAL

To create the awareness and comprehensive knowledge in numerical solutions.

#### OBJECTIVES

The course should enable the students to:

1. Learn the techniques of solving the algebraic and transcendental equations.
2. Learn to interpolate using Newton's forward and backward difference formulae for equal and unequal intervals
3. Understand the use of numerical differentiation and understands to find the approximate area using numerical integration.
4. Understand solving numerically the initial value problems for ordinary differential equations using single step and multi step method.
5. Learn the methods of solving second order partial differential equations numerically and use it to solve initial and boundary value problems for partial differential equations.

#### OUTCOME

The students should be able to:

1. Find out the roots of nonlinear (algebraic or transcendental) equations, solutions of large system of linear equations by direct and indirect methods.
2. Solve problems where huge amounts of experimental data are involved, the methods discussed on interpolation will be useful in constructing approximate polynomial to represent the data and to find the intermediate values.
3. Use the numerical differentiation and integration when the function in the analytical form is too complicated or the huge amounts of data are given such as series of measurements, observations or some other empirical information.
4. Solve engineering problems which are characterized in the form of nonlinear ordinary differential equations, since many physical laws are couched in terms of rate of change of one independent variable
5. Solve the initial and boundary value problems related heat flow, both one and two dimensional and vibration problems. Understands the numerical techniques of solving the partial differential equation in engineering applications.



**UNIT I SOLUTION OF ALGEBRAIC AND TRANSCENDENTAL EQUATIONS 12**

Linear interpolation methods (method of false position) - Newton's method - Statement of Fixed Point Theorem - Fixed point iteration:  $x=g(x)$  method. Solution of linear algebraic system of equations - Direct methods - Gauss-Jordon method and Crout's method - Iterative method: Gauss-Seidel method.

**UNIT II INTERPOLATION AND APPROXIMATION 12**

Interpolation - equal intervals - Newton's forward and backward difference formulae - problems. Interpolation-unequal intervals - Newton's divided difference formula - Lagrange's and inverse interpolation-problems.

**UNIT III NUMERICAL DIFFERENTIATION AND INTEGRATION 12**

Numerical differentiation - Newton's forward and backward difference - Divided differences and finite differences - Numerical integration by trapezoidal and Simpson's 1/3 and 3/8 rules. Two and Three point Gaussian quadrature formulae - Double integrals using trapezoidal and Simpson's rules.

**UNIT IV INITIAL VALUE PROBLEMS FOR ORDINARY DIFFERENTIAL EQUATIONS 12**

Single step methods: Taylor series method - first order-second order and simultaneous - Euler and Modified Euler methods. Fourth order Runge - Kutta method for solving first and second order equations - Multi-step methods: Milne's and Adam's predictor and corrector methods.

**UNIT V INITIAL AND BOUNDARY VALUE PROBLEMS FOR PARTIAL DIFFERENTIAL EQUATIONS 12**

Finite difference solution of second order ordinary differential equation - classification of partial differential equations - Finite difference solution of two dimensional heat flow equations Laplace and Poisson equations. One dimensional heat equation by explicit and implicit methods - One dimensional wave equation.

**TOTAL: 60**

**TEXT BOOKS**

1. Kandasamy P, Thilagavathy K, Gunavathy K, "Numerical Methods", S.Chand Co. Ltd., New Delhi, 2003.
2. Chandrasekaran A. and Beena James, "Numerical Methods", Dhanam publications, Chennai, 2011.

**REFERENCE BOOKS**

1. Burden R.L, and Faires T.D, "Numerical Analysis", Seventh Edition, Thomson Asia Pvt. Ltd., Singapore, 2002.
2. Gerald C.F, Wheatley P.O, "Applied Numerical Analysis", Sixth Edition, Pearson Education Asia, New Delhi, 2002.
3. Balagurusamy E, "Numerical Methods", Tata McGraw-Hill, New Delhi, 1999.

## ELECTIVE - 2 (SEMESTER VII)

### CS2751 GRID COMPUTING

L T P C  
3 0 0 3

#### GOAL

To impart knowledge on genesis and applications of Grid technology.

#### OBJECTIVES

The course should enable the students to:

1. Understand the genesis of grid computing
2. Know the application of grid computing
3. Understand the technology and tool kits for facilitating grid computing

#### OUTCOME

The students should be able to:

1. Understand the Grid services.
2. Acquire knowledge on open Grid service infrastructure.
3. Write program using tool kit.

#### UNIT I INTRODUCTION

8

GRID COMPUTING: Introduction: Early Grid Activities, Current Grid Activities, An Overview of Grid business Areas, Grid Applications.

Grid Computing Organizations and Their Roles: Organizations Developing Grid Standards and Best Practice Guidelines, Organizations Developing Grid Computing Toolkits and the Framework. The Grid computing Anatomy: The Grid Problem. The Grid Computing Road Map.

#### UNIT II MESSAGING

10

Merging the Grid Services Architecture with the Web Services Architecture: Service-Oriented Architecture, Web Service Architecture, XML, Related Technologies, and Their Relevance to Web Services, XML Messages and Enveloping, Service Message Description Mechanisms, Relationship between Web Service and Grid Service.

#### UNIT III OPEN GRID SERVICES

9

Open Grid Services Architecture (OGSA): Some Sample Use cases that drive the OGSA, CDC, NFS, Online Media and Entertainment. OGSA Platform Components.

Open Grid Services Infrastructure (OGSI): Introduction, Grid Services, High-Level Introduction to OGSI, Technical Details of OGSI specification, Introduction to Service Data Concepts, Grid Service : Naming and Change Management Recommendations.

**UNIT IV OGSA BASIC SERVICES****9**

OGSA Basic Services: Common Management Model (CMM), Service domains, Policy Architecture, Security Architecture, Metering and Accounting, Common distributed Logging, Distributed Data Access and Replication.

**UNIT V GLOBUS TOOLKIT****9**

GLOBUS TOOLKIT: Architecture: GT3 software Architecture Model.

GLOBUS TOOLKIT: Programming Model - Introduction, Service Programming Model.

GLOBUS TOOLKIT: A Sample Implementation, Acme Search Service Implementation in a Top-down Approach.

**TOTAL: 45****TEXT BOOK**

1. Joshy Joseph and Craig Fellenstein, "Grid Computing", Pearson Education, 2003.

**REFERENCE BOOKS**

1. Fran Berman, Geoffrey Fox, Anthony J.G. Hey, "Grid Computing: Making the Global Infrastructure a Reality ", John Wiley and Sons, 2003.
2. Ahmar Abbas, "Grid Computing: A Practical Guide to Technology and Applications", Charles River Media, 2003.
3. D Janaki Ram, "Grid Computing", TMH.

**CS2752 USER INTERFACE DESIGN**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>

**GOAL**

To study User-Centered Design- task analysis- GOMS- and other key human computer interaction methods

**OBJECTIVES**

The course should enable the students to:

1. Study the concept of menus, windows, interfaces.
2. Study about business functions.
3. Study the characteristics and components of windows.
4. Study the various controls for the windows.
5. Study about various problems in windows design with colour, text, graphics.

## OUTCOME

The students should be able to:

1. Implement the basics and in-depth knowledge acquired in UI design.
2. Demonstrate the methodologies to design the user interface, menu creation, windows creation and establish connection between menu and windows.

### UNIT I INTRODUCTION 9

Introduction-Importance-Human-Computer interface-characteristics of graphics interface-Direct manipulation graphical system - web user interface-popularity-characteristic and principles.

### UNIT II HUMAN COMPUTER INTERACTION 9

User interface design process- obstacles-usability-human characteristics in design - Human interaction speed-business functions-requirement analysis-Direct-Indirect methods-basic business functions- Design standards-system timings - Human consideration in screen design - structures of menus - functions of menus-contents of menu-formatting -phrasing the menu - selecting menu choice-navigating menus-graphical menus.

### UNIT III WINDOWS 9

Characteristics- components- presentation styles-types-managements-organizations-operations-web systems-device-based controls: characteristics-Screen -based controls: operate control - text boxes-selection control-combination control-custom control-presentation control.

### UNIT IV MULTIMEDIA 9

Text for web pages - effective feedback-guidance & assistance-Internationalization-accessibility-Icons-Image-Multimedia -coloring.

### UNIT V WINDOWS LAYOUT TEST 9

Prototypes - kinds of tests - retest - Information search - visualization - Hypermedia - www - Software tools.

**TOTAL: 45**

## TEXT BOOKS

1. Wilbent. O. Galitz, "The Essential Guide to User Interface Design", John Wiley & Sons, 2001.
2. Ben Shneiderman, Maxine Cohen, Steven M. Jacobs, Catherine Plaisant "Design the User Interface: Strategies for Effective Human-Computer Interaction", 5th Edition, Pearson Education, 2009.

## REFERENCE BOOK

1. Alan Cooper, "The Essential of User Interface Design", Wiley - Dream Tech Ltd., 2002.

## CS2753 E- COMMERCE

L T P C  
3 0 0 3

### GOAL

To acquire knowledge in Enterprise Information Systems and E-Business applications.

### OBJECTIVES

The course should enable the students to:

1. Describe E-Commerce Framework.
2. Explain Electronic Systems for Payment.
3. Learn use of E-Commerce Advertising and Marketing
4. Understand business documents and Digital Library.
5. Understand use of multimedia systems for E-Commerce.

### OUTCOME

The students should be able to:

1. Understand the basics of E-commerce.
2. Know all e-payment systems.
3. Be familiar with E-commerce advertising.
4. Be familiar with all digital business documents used.
5. Be familiar with multimedia systems.

### UNIT I INTRODUCTION OF E-COMMERCE AND BUSINESS OF INTERNET COMMERCIALIZATION

9

Electronic commerce framework and Electronic commerce and media convergence, The anatomy of E-Commerce applications, Electronic commerce consumer applications and Electronic commerce organization applications, Telco/Cable/On-line Companies, National Independent ISPs, Regional level ISPs, Local level ISPs, Service providers abroad, Service provider connectivity: Network Interconnection Points, Internet connectivity options, Logistics of being an internet service provider.

### UNIT II NETWORK SECURITY AND FIREWALLS - ELECTRONIC COMMERCE AND WORLD WIDE WEB

9

Client-server Network security, Emerging Client-server security Threats, Firewalls and Network security, Data and Message security and Challenge and response systems, Encrypted Documents and electronic Mail, U.S Government Regulations and encryption, Architectural Framework for electronic commerce, World wide web as the architecture, Web Background: Hypertext Publishing.

### UNIT III CONSUMER ORIENTED ELECTRONIC COMMERCE-ELECTRONIC PAYMENT SYSTEM

9

Consumer-Oriented Applications, Mercantile process models, Mercantile models from the consumer's perspective, Mercantile models from the merchant's perspective, Types of electronic payment systems,

Digital Token-based Electronic payment systems, Smart cards and electronic payment systems, Credit card-based electronic payment systems, Risk and electronic payment systems.

**UNIT IV INTER ORGANIZATIONAL COMMERCE AND EDI - EDI IMPLEMENTATION - INTERNET BASED EDI** **9**

Electronic Data Interchange, EDI: Applications in Business, EDI: Legal, Security and privacy issues, EDI and electronic commerce, Standardization and EDI, EDI software implementation, EDI envelope for message transport, Value-Added Networks, Internet Based EDI.

**UNIT V ADVERTISING AND MARKETING ON THE INTERNET ON DEMAND EDUCATION AND DIGITAL COPYRIGHTS** **9**

The new age of information-based Marketing, Advertising on the internet, Charting the On-Line Marketing Process, Market research, Computer Based Education and Training, Technological Components of education On-Demand, Digital copyrights and electronic commerce.

**TOTAL: 45**

**TEXT BOOK**

1. Ravi Kalakota and Andrew B Whinston, "Frontiers of Electronic Commerce", Addison Wesley 1996. (Chapters: 1,4,5,6,7,8,9,10,13,15)

**REFERENCE BOOKS**

1. Henry Chan, Raymond Lee, Tharam Dilon, Elizabeth Change, "E-Commerce Fundamental and Applications", John Wiley, 2001.
2. David Whiteley, "E-Commerce, Stategy, Technologies and Applications", Tata McGraw Hill, 2000
3. U.S.Pandey, Rahul Srivastava, Saurabh Shukla, "E-Commerce and its Applications", S.Chand & Co, 2007.

**CS2754 SOFTWARE PROJECT MANAGEMENT**

**L T P C**  
**3 0 0 3**

**GOAL**

To learn Software Project planning processes and Globalization Issues in Project management

**OBJECTIVES**

The course should enable the students to:

1. Introduce and develop concepts that is seen as central to the effective management of software projects.
2. Develop an appreciation of key generic project management concepts and techniques
3. Use techniques and approaches that is specific to the management of software projects.

## OUTCOME

The students should be able to:

1. Gain knowledge in Life cycle models.
2. Learn the Umbrella activities in software Project management.
3. Obtain confidence in Project management processes and activities.

### **UNIT I SOFTWARE MANAGEMENT AND ECONOMICS 9**

Conventional Software Management: The waterfall model, conventional software Management performance.

Improving Software Economics: Reducing Software product size, improving software processes, improving team effectiveness, improving automation, Achieving required quality, peer inspections.

### **UNIT II LIFE CYCLE AND ARTIFACTS 9**

The old way and the new way: The principles of conventional software Engineering, principles of modern software management, transitioning to an iterative process.

Life cycle phases: Engineering and production stages, Inception, Elaboration, Construction, Transition phases.

Artifacts of the process: The artifact sets, Management artifacts, Engineering artifacts, programmatic artifacts.

### **UNIT III WORK FLOWS AND CHECK POINTS 9**

Work Flows of the process: Software process workflows, Iteration workflows.

Checkpoints of the process: Major mile stones, Minor Milestones, Periodic status assessments.

Iterative Process Planning: Work breakdown structures, planning guidelines, cost and schedule estimating, Iteration planning process, Pragmatic planning.

### **UNIT IV PROCESS AUTOMATION AND PROJECT CONTROL 9**

Process Automation: Automation Building blocks.

Project Control and Process instrumentation: The seven core Metrics, Management indicators, quality indicators, life cycle expectations, pragmatic Software Metrics, Metrics automation.

Tailoring the Process: Process discriminants.

### **UNIT V NEXT GENERATION SOFTWARE ECONOMICS 9**

Project Organizations and Responsibilities: Line-of-Business Organizations

Future Software Project Management: Modern Project Profiles, Next generation Software economics, modern process transitions.

Case Study: The Command Center Processing and Display system- Replacement (CCPDS-R)

**TOTAL: 45**

### TEXT BOOKS

1. Bob Hughes and Mike Cotterell, "Software Project Management", 5th Edition, Tata McGraw Hill, 2009.
2. Walker Royce, "Software Project Management: A Unified Approach", Pearson Education, 1998.

### REFERENCE BOOKS

1. Joel Henry, Software Project Management, Pearson Education, 2004.
2. Pankaj Jalote, Software Project Management in practice, Pearson Education.2005.

## CS2755 NEURAL NETWORKS

L T P C  
3 0 0 3

### GOAL

To introduce the concept of Neural networks, its algorithms and applications.

### OBJECTIVES

The course should enable the student to:

1. Learn the basics of ANN.
2. Learn the various architectures of building an ANN and its applications.
3. Learn the various algorithms in ANN and their implementation.
4. Learn the pattern classification techniques, advanced methods of representing information in ANN.

### OUTCOME

The students should be able to:

1. Wxplain the basic concepts of artificial neural networks and its various layered architectures.
2. Demonstrate various types of feed forward neural networks and the concepts of Associative memory.
3. Understand the self organizing map and the issues of training the counter propagation network.
4. Explain the neocognitron architecture and its performance measures.

### UNIT I INTRODUCTION

9

Introduction to ANS technology-Neural circuits and computation-Hebbian learning-General Processing Element-Vector formulation-Perceptron model-ANS simulation - Need - Design guidelines for simulators- Array based ANS structure-ANS Data structure Extension of ANS data structures- Adaline and Madaline - Signal processing and filters review-Adaline and the Adaptive linear combiner-LMS learning rule-Practical considerations-Applications-Madaline Architecture-MRII Training algorithm-Madaline for Translation-Invariant Pattern recognition-Simulating Adaline - Data structure-Implementation.



**UNIT II BACKPROPAGATION AND BAM****9**

Backpropagation network-Approach-BPN operation-Generalized Delta rule-Update of weights-Practical considerations-Applications-Backpropagation simulator BAM and Hopfield Memory-Associative memory definitions-Linear associator-BAM architecture- Processing-mathematics-energy function-Hopfield memory-Continuous Hopfield model-TSP problem- Simulating the BAM.

**UNIT III SIMULATED ANNEALING AND CPN****9**

Simulated annealing-Information theory and statistical mechanics-concepts-Annealing-Boltzman machine- Learning-Boltzmann simulator-Application Counterpropagation network-Building blocks-Input layer-Instar-competitive networks-Outstar-CPN data processing-Forward mapping-Practical consideration-Application-Simulator.

**UNIT IV SELF ORGANIZING MAPS AND ADAPTIVE RESONANCE THEORY****9**

Self organizing maps-SOM data processing-Learning algorithm-Feature map classifier-Applications-Simulating the SOM - Adaptive resonance theory-network description-Gain control in ART-ART1-ART2-Simulation.

**UNIT V SPATIOTEMPORAL PATTERN CLASSIFICATION AND NEOCOGNITRON****9**

Spatiotemporal pattern classification-Formal avalanche-Architectures-Sequential competitive avalanche field-example-Applications-STN simulation - Neocognitron-Architecture-functional description-data processing-cell processing-training-Application.

**TOTAL: 45****TEXT BOOK**

1. James A. Freeman and David M. Skapura, Neural networks-Algorithms, Applications and Programming techniques, Pearson Education Asia, 2001

**REFERENCE BOOKS**

1. Robert Hech-Nielson, Neuro-computing, Addison Wesley Reading, 1990
2. Igor Alexander, Neural computing architectures, MIT Press, 1989
3. Bart Kosko, Neural networks and fuzzy systems ,Prentice Hall, Englewood Cliffs,1992

## ELECTIVE - 3 (SEMESTE VII)

### CS2756 .NET FRAMEWORK AND PROGRAMMING

L T P C  
3 0 0 3

#### GOAL

To learn the fundamental concepts in .NET framework and programming.

#### OBJECTIVES

The course should enable the students to:

1. Gain knowledge in the concepts of the .NET framework as a whole and the technologies that constitute the framework.
2. Write Programs in C# and ASP.Net, both in basic and advanced levels.
3. Build sample applications.
4. Develop an appreciation of key generic .Net concepts and techniques.

#### OUTCOME

The students should be able to:

1. Learn the basis of .Net framework.
2. Understand object oriented aspects of C# and ASP.Net.
3. Develop simple applications under .Net framework.
4. Develop Web based Applications using .Net programming languages.

#### UNIT I INTRODUCTION TO .NET

9

Over view of .NET, Architecture of .NET, Introduction to CLR, CLR architecture, Just-in-time compiler(JIT), Microsoft Intermediate Language(MSIL), Understanding IL with ILDASM, .NET Framework, common class library, common type system (CTS), common language specifications (CLS), Languages under .NET, Working with Microsoft Visual studio IDE.

#### UNIT II OBJECT ORIENTED PROGRAMMING USING C#

9

Features and phases of the object-oriented approach, simple C# programs, decision-making constructs and loop constructs, Implement structures, enumerations, arrays, and collections, polymorphism and overload functions and operators, delegates and events , stream classes to implement file handling.

#### UNIT III GUI APPLICATIONS DEVELOPMENT USING .NET FRAMEWORK

9

Windows Forms and controls, Perform validation of controls using classes and controls, Dialog Boxes, Menus and MDI Application, Printing and Reporting Functionality in a Windows Forms Application, Package and deploy applications.

**UNIT IV DEVELOPING DATABASE APPLICATIONS USING ADO.NET****9**

Create and manage connections using ADO.NET, Identify the disconnected and connected environment in ADO.NET, Create datasets and data tables, Retrieve and store large binary data, Perform bulk copy operations , Execute SQL notification maintain and update a cache, Read, write, validate, and modify XML data using XML reader and writer classes.

**UNIT V DEVELOPING WEB APPLICATIONS USING ASP.NET****9**

Create a Web Application, Program a Web Application, Add and Configure Server Controls, Create a Common Layout by Using Master Pages, Manage State for a Web Application , Access and Display Data, Control Access to a Web Application , Deploy a Web Application, Build Dynamic Web Applications, Create Controls for Web Applications.

**TOTAL: 45****REFERENCE BOOKS**

1. Andrew Troelsen, "Pro C# 10 and the .NET 4 Platform", 5th Edition, Apress, 2010.
2. Bill Evjen, Scott Hanselman, Devin Rader, "Professional ASP.NET 3.5: In C# and VB (Programmer to Programmer)", Wrox Publications, 2008.
3. Eric Butow and Tommy Ryan, "C# Your Visual Blueprint for building .NET Applications", Visual Publications, 2001.
4. Danny Ryan and Tommy Ryan, "ASP.NET Your Visual Blueprint for building Web on the .NET Framework", Visual Publisher, 2001.
5. Peter Wright, Beginning Visual C# 2005 Express Edition: From Novice to Professional, Apress, 2006.
6. Christian Nagelet et al, Professional C# 2005, Wiley Publishing, 2006.
7. Fritz Onion, Keith Brown, Essential ASP.NET 2.0, Addison Wesley , 2006.

**CS2757 PROGRAMMING IN ASP.NET****L T P C**  
**3 0 0 3****GOAL**

To learn the fundamental concepts in .NET framework and ASP.NET.

**OBJECTIVES**

The course should enable the student to:

1. Learn the features of .NET Framework
2. Learn the basic syntax of ASP .NET programs.
3. Learn objects and security in ASP.NET.
4. Learn the web services of ASP.NET.
5. Learn the concept of ADO.NET.

## OUTCOME

The students should be able to:

1. Understand the concepts of .NET.
2. Create and deploy the ASP.NET application.
3. Applications using ASP.NET objects
4. Create and deploy the web applications.
5. Develop applications using the ADO.NET.

### UNIT I INTRODUCTION 9

Over view of .NET, Architecture of .NET, Introduction to CLR, CLR architecture, Just-in-time compiler(JIT), Microsoft Intermediate Language(MSIL), Understanding IL with ILDASM, .NET Framework, common class library, common type system(CTS), common language specifications(CLS), Languages under .NET, Working with Microsoft Visual studio IDE.

### UNIT II ASP.NET 9

Introducing ASP.Net, Creating an ASP.Net application, Deploying an ASP.Net web application, Creating web forms, Web Server controls-Label, Textbox, Checkbox, Radio button,, list box, dropdown list, Hyperlink control, table, image, button, link button and image button controls, Working with Events, Rich web Controls, Custom Control, Validation Controls.

### UNIT III ADO.NET 9

ADO.Net basics and object model, Changes from ADO, Communicating with OLEDB data sources-Connection command, Data reader, Data Adapter, Data table, Introduction to data binding, Binding data to page properties, Binding to an array list, methods, data view, Using a data grid, Header and footer, Using columns property, Introduction to templates, Creating templates.

### UNIT IV ASP.NET CONFIGURATION 9

ASP.Net configuration Concept, Web.config configuration files, ASP.Net configuration sections, Security settings, Introduction to HTTP runtime and HTTP Handlers, Interfaces and classes used to create HTTP Handlers, Creating HTTP handlers, Introduction to caching, Caching in ASP.Net, Caching page Output.

### UNIT V ASP.NET SECURITY 9

Introduction to ASP.Net security, Authentication in web applications, Forms-based authentication, Introduction to localization, Setting culture and Region, Using resource files, Introduction to web services, web services Infrastructure, Understanding SOAP, Building a web service.

**TOTAL: 45**

## REFERENCE BOOKS

1. Mridula Parihar, et. al., "ASP .NET Bible", Wiley-Dreamtech India Pvt. Ltd., 2002.
2. Andrew Troelsen, "Pro C# 10 and the .NET 4 Platform", 5th Edition, Apress, 2010.

3. Danny Ryan and Tommy Ryan, "ASP.NET Your Visual Blueprint for building Web on the .NET Framework", Visual Publisher, 2001.
4. Fritz Onion, Keith Brown, Essential ASP.NET 2.0, Addison Wesley , 2006.

### **CS2758 DIGITAL IMAGE PROCESSING**

**L T P C**  
**3 0 0 3**

#### **GOAL**

To learn Image fundamentals and various Image enhancement, restoration and compression techniques.

#### **OBJECTIVES**

The course should enable the students to:

1. Study the image fundamentals and mathematical transforms necessary for image processing.
2. Study the image enhancement techniques
3. Study image restoration procedures.
4. Study the image compression procedures.
5. Study the image segmentation and representation techniques.

#### **OUTCOME**

The students should be able to:

1. Understand the concepts and application areas of digital image processing,
2. Understand the theory and predominant algorithms used in digital image processing systems,
3. Implement the standard algorithms commonly used in image processing systems.
4. Solve a real-world digital image processing problem by designing an appropriate system.

#### **UNIT I IMAGE FUNDAMENTALS**

**9**

Digital Image Fundamentals: Image Sensing and Acquisition, Image Sampling and Quantization, Basic Relationships between Pixels, Mathematical Tools Used in Digital Image Processing - Intensity Transformations and Spatial Filtering: Basic Intensity Transformation Functions, Histogram Processing, Fundamentals of Spatial Filtering, Smoothing Spatial Filters, Sharpening Spatial Filters, Hybrid Spatial Enhancement Methods.

#### **UNIT II FREQUENCY DOMAIN, IMAGE RESTORATION AND**

**9**

Filtering in the Frequency Domain: Revision of Sampling and the Fourier Transform of Sampled Functions, The Discrete Fourier Transform (DFT) of One Variable, Extension to Functions of Two Variables, Properties of the 2-D Discrete Fourier Transform, Filtering in the Frequency Domain, Image Smoothing Using Frequency Domain Filters, Image Sharpening Using Frequency Domain Filters, Selective Filtering, Filter Design and Implementation.

Image Restoration and Reconstruction: Noise Models, Restoration in the Presence of Noise Only (Spatial Filtering), Periodic Noise Reduction by Frequency Domain Filtering, Linear, Position-Invariant Degradations, Estimation of Degradation Function, Inverse Filtering, Minimum Mean Square Error (Wiener) Filtering, Constrained Least Squares Filtering, Geometric Mean Filter, Image Reconstruction from Projections.

### **UNIT III COLOUR IMAGE PROCESSING**

**9**

Colour Fundamentals, Colour Models, Pseudo-colour Image Processing, Full-Colour Image Processing, Colour Transformations, Smoothing and Sharpening Image Segmentation Based on Colour, Noise in Color Images.

Wavelets and Multiresolution Processing: Background, Multiresolution Expansions, Wavelet Transforms in One Dimension, The Fast Wavelet Transform, Wavelet Transforms in Two Dimensions, Wavelet Packets.

### **UNIT IV IMAGE COMPRESSION**

**9**

Image Compression: Fundamentals, Compression Methods, Digital Image Watermarking

Erosion and Dilation, Opening and Closing, The Hit-or-Miss Transformation, Morphological Algorithms, Gray-Scale Morphology.

### **UNIT V IMAGE SEGMENTATION AND REPRESENTATION**

**9**

Image Segmentation: Fundamentals, Point, Line, and Edge Detection, Thresholding, Region-Based Segmentation, Segmentation Using Morphological Watersheds, The Use of Motion in Segmentation.

Representation and Description: Representation, Boundary Descriptors, Regional Descriptors, Use of Principal Components for Description, Relational Descriptors.

**TOTAL: 45**

### **TEXT BOOK**

1. Rafael C Gonzalez, Richard E Woods, "Digital Image Processing", 3rd Edition, Prentice Hall, 2008.

### **REFERENCE BOOKS**

1. William K Pratt, "Digital Image Processing", John Willey, 2001.
2. Millman Sonka, Vaclav Hlavac, Roger Boyle, Broos/Colic, "Image Processing Analysis and Machine Vision", Thompson Learniy, 1999.
3. A.K. Jain, "Fundamentals of Digital Image Processing", Prentice Hall, 1995.
4. Chanda Dutta Magundar, "Digital Image Processing and Applications", Prentice Hall, 2000.

## CS2759 FREE OPEN SOURCE SOFTWARE

L T P C  
3 0 0 3

### GOAL

To Understand the fundamental principles of Enterprise Application using free open source software (OSS).

### OBJECTIVES

The course should enable the students to:

1. Introduce the basic definitions and advantages of FOSS.
2. Know installation of FOSS with additional hardware and setting up with email server.
3. Introduce software development process and various library and linker files.
4. Introduce the debugging tools.
5. Practice the ability to review the OSS code.

### OUTCOME

The students should be able to:

1. Understand the basic definitions and advantages.
2. Understand the Software Development Process with additional hardware.
3. Understand the various library and linker files.
4. Understand the debugging tools.
5. Have a great experience in understanding the usage of FOSS.

### UNIT I OVERVIEW

9

Overview of Free/Open Source Software-- Definition of FOSS - GNU, History of GNU/Linux and the Free Software Movement , Advantages of Free Software and GNU/Linux, FOSS usage , trends and potential, global and Indian. GNU/Linux OS installation-- detect hardware, configure disk partitions - file systems and install a GNU/Linux distribution ; Basic shell commands - logging in, listing files, editing files, copying/moving files, viewing file contents, changing file modes and permissions, process management ; User and group management, file ownerships and permissions, PAM authentication ; Introduction to common system configuration files - log files ; Configuring networking, basics of TCP/IP networking and routing, connecting to the Internet (through dialup, DSL, Ethernet, leased line).

### UNIT II HARDWARE CONFIGURATION AND SETTING EMAIL SERVER

9

Configuring additional hardware - sound cards, displays - display cards, network cards, modems, USB drives, CD writers ; Understanding the OS boot up process ; Performing every day tasks using gnu/Linux -- accessing the Internet, playing music, editing documents and spreadsheets, sending and receiving email, copy files from disks and over the network, playing games, writing CDs ; X Window system configuration and utilities-- configure X windows, detect display devices ; Installing software - from source code as well as using binary packages.

Setting up email servers-- using postfix ( SMTP services), courier ( IMAP POP3 services), squirrel mail ( web mail services) ; Setting up web servers -- using apache ( HTTP services), php (server-side scripting), perl ( CGI support) ; Setting up file services -- using samba ( file and authentication services for windows networks), using NFS ( file services for gnu/Linux / Unix networks) ; Setting up proxy services -- using squid ( http / ftp / https proxy services) ; Setting up printer services - using CUPS (print spooler), foomatic (printer database)

### **UNIT III FIREWALL SETTING**

**9**

Setting up a firewall - Using netfilter and ip tables; Using the GNU Compiler Collection -GNU compiler tools ; the C preprocessor (cpp), the C compiler (gcc) and the C++ compiler (g++), assembler (gas) ; Understanding build systems -- constructing make files and using make, using autoconf and autogen to automatically generate make files tailored for different development environments ; Using source code versioning and management tools -- using CVS to manage source code revisions, patch diff.

### **UNIT IV UNDERSTANDING LIBRARIES AND LINKER**

**9**

Understanding the GNU Libc libraries and linker -- linking against object archives (.a libraries) and dynamic shared object libraries (.so libraries), generating statically linked binaries and libraries, generating dynamically linked libraries ; Using the GNU debugging tools -- gdb to debug programs, graphical debuggers like ddd, memory debugging / profiling libraries mpatrol and valgrind ; Review of common programming practices and guidelines for GNU/Linux and FOSS ; Introduction to Bash, sed & amp; amp; amp; amp; awk scripting. Basics of the X Windows server architecture.

### **UNIT V PROGRAMMING**

**9**

Qt Programming ; Gtk+ Programming ; Python Programming ; Programming GUI applications with localisation support.

**TOTAL: 45**

### **REFERENCE BOOKS**

1. N. B. Venkateshwarlu, "Introduction to Linux: Installation and Programming", B S Publishers, 2005. (An NRCFOSS Publication)
2. Matt Welsh, Matthias Kalle Dalheimer, "Running Linux", 5th Edition, O'Reilly Publishers, 2005.
3. Carla Schroder, "Linux Cookbook", O'Reilly Cookbooks Series, 2004.
4. Joshua Gay (Editor), "Free Software, Free Society: Selected Essays of Richard M. Stallman", First Edition, GNU Press, 2002,
5. (Downloadable version: <http://www.gnupress.org/philosophy/fsfs/rms-essays.pdf>)
6. Learning the bash Shell, 3rd Edition, O'Reilly, 2005.
7. URL: <http://www.oreilly.com/catalog/bash3/index.html>



## CS2760 ADVANCED JAVA PROGRAMMING

L T P C  
3 0 0 3

### GOAL

To learn Java Applets, Java Beans, and Swing Programming, Java Applets, Beans and JDBC.

### OBJECTIVES

The course should enable the students to:

1. Learn various Advanced Java and techniques.
2. Learn Java Applets, Java Beans, and Swing Programming.
3. Learn Various Animation techniques, Advanced Networking Concepts, JDBC and Advanced Scripting Techniques.

### OUTCOME

The students should be able to:

1. Create WebPages with applets, animation, 2D and 3D graphics.
2. Design distributed applications using RMI and Remote objects.
3. Create database applications using JDBC and accessing Multimedia database.

### UNIT I CORE JAVA OVERVIEW

9

Core Java Overview: Object oriented concepts, Exception Handling, Multi Threading Introduction to JDBC: Overview of JDBC API, The Java.sql package, JDBC Drivers, Executing SQL commands using JDBC Drivers, static and dynamic Execution of SQL statements, Execution of Stored Procedures using JDBC.

### UNIT II ADVANCED CONCEPTS AND TECHNOLOGIES

9

Introduction to Transactions and Transaction Methods, Introduction to JNDI, Introduction to Data Source and Connection pooling, Introduction to Web Applications, Web Servers Overview of J2EE Technologies.

### UNIT III JAVA SERVLETS

9

Introduction to Java Servlets, Static and Dynamic contents, Servlet life Cycle and Life cycle methods, Servlet Request and Response Model, Deploying a Servlet, Servlet State Transitions, Servlet Configuration and Servlet Context, Servlet Redirection and Request Dispatch, Servlet Synchronization and Thread Model. Maintaining Client State: Cookies, URL rewriting, Hidden form fields, Session Tracking.

### UNIT IV JAVA SERVER PAGES TECHNOLOGY

9

Introduction to JSP : JSP & Servlet as Web Components, Servlets vs. JSP, JSP Lifecycle, JSP Page Lifecycle Phases, General Rules of Syntax, JSP syntactic elements, JSP element syntax, Template content. JSP elements? directives, declarations, expressions, scriptlets, actions. JSP Standard Actions:

jsp:useBean, jsp:get Preoperty, jsp:set Property, jsp:include, jsp:forward, jsp:plugin,jsp:param,java Server Pages Standard Tag Library(JSTL).

## UNIT V AJAX

9

AJAX :Ajax Fundamentals, JavaScript Libraries, The Prototype Library, The Fade Anything Technique Library, Form Completion. Realtime Validation, Propagating Client?Side View State Direct Web Remoting, Ajax Components, Hybrid Components, Keeping JavaScript Out of Renderers, Transmitting JSP Tag Attributes to JavaScript Code,Ajax4jsf,Implementing Form Completion with Ajax4jsf,Implementing Realtime Validation with Ajax4jsf.Introduction to Java Web Services, Future Trends in Web Technology WEB 2.0.

**TOTAL: 45**

## REFERENCE BOOKS

1. Subrahmanyam Allamaraju and Cedric Buest, "Professional Java Server Programming: J2EE", Apress publication, 2007.
2. David Geary,Cay Horstmann, "Core Java Server Faces", 2nd Ed., Prentice Hall, 2007.
3. References
4. Dustin R Callaway, "Inside Servlets: A Server Side Programming for the Java platform", Pearson Education, 2005.
5. Vivek Chopra, Jon Eaves, Rubert jones, Sing Li, John T.Bell, "Beginning Java Server Pages", Wrox publishers, 2005.
6. Ivor Horton, Kevin Mukhar and James L.Weaver, "Beginning J2EE 1.4",Apress, 2004.

## LABORATORY FOR ELECTIVE 3 (SEMESTER VII) CS2732 .NET PROGRAMMING LABORATORY

L T P C  
0 0 4 2

## GOAL

To implement the concept learned in .NET Frame work and Programming.

## OBJECTIVE

The course should enable the student to

1. Understand basic programs using objects,multithreading, string handling and file handling
2. Gain knowledge in developing windows forms using controls
3. Have knowledge in creating web pages

## OUTCOME

The student should be able to

1. Implement basic programs using objects, multithreading, string handling and file handling

2. Implement windows forms using controls
3. Create web pages.

### LIST OF EXPERIMENTS

(Implement the following using C# and ASP.Net)

1.	Basic Programs to demonstrate the working of basic data types.	5
2.	Programs to implement the use of Objects.	5
3.	Programs to implement multithreading	5
4.	Programs to implements String handling	5
5.	Programs to implement file handling	5
6.	Using ADO.Net to handle data, connecting to a database, firing queries to display data	5
7.	Developing windows forms	5
8.	Using various controls on Windows forms.	5
9.	Create web page for Course Registration	5
10.	Create web pages for Shopping Cart	5
11.	Create web pages for Airline reservation	5
12.	Create web pages for Job portal	5

### CS2733 ASP.NET PROGRAMMING LABORATORY

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>0</b>	<b>0</b>	<b>4</b>	<b>2</b>

### GOAL

To implement the concept learned in ASP.NET.

### OBJECTIVES

The course should enable the student to:

1. Have knowledge in different user controls
2. Understand the use of components

### OUTCOME

The student should be able to:

1. Implement user controls in the web form
2. Create components and display the results in web form

## LIST OF EXPERIMENTS

1. Create a user control that contains a list of colours. Add a button to the Web Form which when clicked changes the colour of the Form to the color selected from the list. 4
2. Write a program to display "Welcome To Radiant" in the form when the "click" button is clicked. The form title must be ASP.NET 4
3. Write a program that displays a button in green colour and it should change into yellow when the mouse moves over it. 4
4. Create a user control that receives the user name and password from the user and validates them. If the user name is "Radiant" and the password is "asp.net" then the user is authorized, otherwise not. 4
5. Create a user control that displays the current date and time. Include it in a Web Form and refresh it each time a button is clicked. 4
6. Create two components, the first of which is an abstract class containing an abstract method. The second component should implement the first component's abstract class and returns a string from the method. Display the result in a Web Form. 4
7. Select names from the emps table. Retrieve the result in a DataSet. Bind the DataSet to a RadioButtonList and display the result in three different forms as follows: 4
  - a. The RepeatDirection property of the RadioButtonList is set to horizontal and its RepeatLayout property is set to Table.
  - b. The RepeatDirection property of the RadioButtonList is set to Vertical and its RepeatLayout property is set to Table.
  - c. The RepeatLayout property of the RadioButtonList is set to flow.
8. Create web page for Course Registration 4
9. Create web pages for Banking 4
10. Create web pages for Shopping Cart 4
11. Create web pages for Airline reservation 4
12. Create web pages for Job portal 4
13. Create web pages for On-Line Telephone Billing System 4
14. Create web pages for On-Line Quiz. 4
15. Create web pages for Hospital Management System. 4

## CS2734 DIGITAL IMAGE PROCESSING LABORATORY

L T P C  
0 0 4 2

### GOAL

To implement the concept learned in Digital Image Processing

### OBJECTIVE

To understand the concepts learned in Digital Image Processing.

### OUTCOME

To familiarise image processing concepts through implementation.

### LIST OF EXPERIMENTS

1. Point-to-point transformation. This laboratory experiment provides for thresholding an image and the evaluation of its histogram. The user can choose a threshold level to see the image showing only the pixels at that threshold. 5
2. Morphological operations I. This experiment is intended so students can appreciate the effect of morphological operations using a small structuring element on simple binary images. The operations that can be performed are erosion, dilation, opening, closing, open-close, close-open. 5
3. Morphological operations II. This experiment is designed to let students know how morphological functions change images by applying consecutive erosion and dilation operations. 5
4. Histogram equalization. This experiment illustrates the relationship among the intensities (gray levels) of an image and its histogram. It shows how to improve the image by equalizing the histogram. 5
5. Geometric transformations. This experiment shows image rotation, scaling, and translation. 4
6. Two-dimensional Fourier transform I. The purpose of this experiment is to provide an understanding of the harmonic content of an image using the discrete Fourier transform (DFT). 5
7. Two-dimensional Fourier Transform II. This experiment is designed so the student learns the concept of masking with the DFT. 4
8. Linear filtering using convolution. After completing this experiment every student should understand the concepts of filtering using linear convolution. 4
9. Highly selective filters. In this experiment students appreciate the effects on an image after a highly selective material is applied to it. 5
10. Ideal filters in the frequency domain. This experiment allows students to appreciate the effects of filtering low and high frequencies in an image. 4
11. Non Linear filtering using convolutional masks. This experiment allows students to understand the effects of a median filter on an image corrupted with impulsive noise. 5

- |     |   |   |
|-----|---|---|
| 12. | Entropy as a compression measure. This experiments introduces students to entropy as a compression measurement to the DPCM compression measure. | 5 |
| 13. | Edge detection. This experiment enables students to understand the concept of edge detectors and their operation in noisy images.               | 4 |

### CS2735 FOSS LABORATORY

L T P C  
0 0 4 2

#### GOAL

To implement the concept learned in Free and Open Source Software

#### OBJECTIVE

To understand the concepts learned in Free and Open Source Software.

#### OUTCOME

To learn the advantages of using FOSS and develop applications using FOSS.

#### LIST OF EXPERIMENTS

- |    |  |   |
|----|--|---|
| 1. | Kernel configuration, compilation and installation : Download / access the latest kernel source code from kernel.org, compile the kernel and install it in the local system. Try to view the source code of the kernel                                 | 5 |
| 2. | Virtualisation environment (e.g., xen, qemu or lguest) to test an applications, new kernels and isolate applications. It could also be used to expose students to other alternate OSs like *BSD  | 5 |
| 3. | Compiling from source : learn about the various build systems used like the auto* family, cmake, ant etc. instead of just running the commands. This could involve the full process like fetching from a cvs and also include autoconf, automake etc., | 5 |
| 4. | Introduction to packet management system : Given a set of RPM or DEB, how to build and maintain, serve packages over http or ftp. and also how do you configure client systems to access the package repository.                                       | 5 |
| 5. | Installing various software packages Either the package is yet to be installed or an older version is existing. The student can practice installing the latest version. Of course, this might need internet access.                                    | 5 |
|    | a. Install samba and share files to windows  |   |
|    | b. Install Common Unix Printing System(CUPS)   |   |
| 6. | Write userspace drivers using fuse -- easier to debug and less dangerous to the system (Writing full-fledged drivers is difficult at student level)  | 5 |
| 7. | GUI programming : a sample programme - using Gambas since the students have VB knowledge. However, one should try using GTK or QT  | 5 |
| 8. | Version Control System setup and usage using RCS, CVS, SVN   | 5 |

- |     |  |   |
|-----|--|---|
| 9.  | Text processing with Perl: simple programs, connecting with database e.g., MYSQL                         | 5 |
| 10. | Running PHP : simple applications like login forms after setting up a LAMP stack                         | 5 |
| 11. | Running Python : some simple exercise - e.g. Connecting with MySql database                              | 5 |
| 12. | Set up the complete network interface using ifconfig command like setting gateway, DNS, IP tables, etc., | 5 |

### CS2736 ADVANCED JAVA PROGRAMMING LABORATORY

**L T P C**  
**0 0 4 2**

#### GOAL

To implement the concept learned in Advanced JAVA Programming

#### OBJECTIVE

To understand the concepts learned in Advanced JAVA Programming.

#### OUTCOME

The students are able to create and deploy applications for server and client.

#### LIST OF EXPERIMENTS

- |     |   |   |
|-----|---|---|
| 1.  | Program on multi-threading showing how CPU time is shared among all the threads.  | 5 |
| 2.  | Program for Producer-Consumer problem using threads.  | 5 |
| 3.  | Program to send messages across two machines using simple sockets.  | 5 |
| 4.  | Write an applet program to demonstrate Graphics class.  | 5 |
| 5.  | Write GUI application which uses awt components like label, button, text field, text area, choice, checkbox, checkbox group.  | 5 |
| 6.  | Write a program to demonstrate MouseListener, MouseMotionListener, KeyboardListener, ActionListener, ItemListener.  | 5 |
| 7.  | Develop swing application which uses JTree, Jtable, JComboBox.  | 5 |
| 8.  | Write a JDBC Application to implement DDL and DML commands.   | 5 |
| 9.  | Write a program to implement client/server applications using connection oriented & connection less mechanisms.   | 5 |
| 10. | Write JavaScript to validate the following fields of the above registration page. Name (Name should contain alphabets and the length should not be less than 6 characters). Password (Password should not be less than 6 characters length). E-mail id (should not contain any invalid and must follow the standard pattern name@domain.com) Phone number (Phone number should contain 10 digits only). | 5 |

**Note : You can also validate the login page with these parameters.**

11. Install a database(Mysql or Oracle). 5  
Create a table which should contain at least the following fields: name, password, email-id, phone number(these should hold the data from the registration form).

**Practice 'JDBC' connectivity.**

Write a java program/servlet/JSP to connect to that database and extract data from the tables and display them. Experiment with various SQL queries.

Insert the details of the users who register with the web site, whenever a new user clicks the submit button in the registration page.

12. Client server programming using servlets, ASP and JSP on the server side and java script on the client side 5

**ELECTIVE 4 (SEMESTER VIII)**

**CS2851 CLOUD COMPUTING**

**L T P C**  
**3 0 0 3**

**GOAL**

Understand the architecture of Cloud and industry frameworks.

**OBJECTIVES**

The course should enable the students to :

1. Study about migrating into cloud.
2. Study IAS and enterprise cloud.
3. Study security aspects in cloud and integration of cloud.

**OUTCOME**

The students should be able to:

1. Understand migration.
2. Explain issues for enterprise application.
3. Understand cloud security and integration of cloud.

**UNIT I CLOUD COMPUTING**

**9**

Introduction to Cloud Computing, Definition, Characteristics, Components, Cloud provider, SAAS, PAAS, IAAS and Others, Organizational scenarios of clouds, Administering & Monitoring cloud services, benefits and limitations, Deploy application over cloud, Comparison among SAAS, PAAS, IAAS

Cloud computing platforms: Infrastructure as service: Amazon EC2, Platform as Service: Google App Engine, Microsoft Azure, Utility Computing, Elastic Computing.



## **UNIT II CLOUD TECHNOLOGY**

**9**

Introduction to Cloud Technologies, Study of Hypervisors Compare SOAP and REST Webservices, AJAX and mashups-Web services: SOAP and REST, SOAP versus REST, AJAX: asynchronous 'rich' interfaces, Mashups: user interface services Virtualization Technology: Virtual machine technology, virtualization applications in enterprises, Pitfalls of virtualization.

Multitenant software: Multi-entity support, Multi-schema approach, Multi-tenance using cloud data stores, Data access control for enterprise applications.

## **UNIT III DATA IN THE CLOUD**

**9**

Data in the cloud: Relational databases, Cloud file systems: GFS and HDFS, BigTable, HBase and Dynamo.

Map-Reduce and extensions: Parallel computing, The map-Reduce model, Parallel efficiency of Map-Reduce, Relational operations using Map-Reduce, Enterprise batch processing using Map-Reduce, Introduction to cloud development, Example/Application of Mapreduce, Features and comparisons among GFS,HDFS etc, Map-Reduce model.

## **UNIT IV CLOUD SECURITY**

**9**

Cloud security fundamentals, Vulnerability assessment tool for cloud, Privacy and Security in cloud.

Cloud computing security architecture: Architectural Considerations- General Issues, Trusted Cloud computing, Secure Execution Environments and Communications, Micro-architectures; Identity Management and Access control-Identity management, Access control, Autonomic Security.

Cloud computing security challenges: Virtualization security management- virtual threats, VM Security Recommendations, VM-Specific Security techniques, Secure Execution Environments and Communications in cloud.

## **UNIT V INTERCLOUD ENVIRONMENTS**

**9**

Issues in cloud computing, Implementing real time application over cloud platform.

Issues in Intercloud environments, QOS Issues in Cloud, Dependability, data migration, streaming in Cloud. Quality of Service (QoS) monitoring in a Cloud computing environment.

Cloud Middleware. Mobile Cloud Computing. Inter Cloud issues. A grid of clouds, Sky computing, load balancing, resource optimization, resource dynamic reconfiguration, Monitoring in Cloud.

**TOTAL: 45**

## **TEXT BOOKS**

1. Judith Hurwitz, R.Bloor, M.Kanfman, F.Halper, "Cloud Computing for Dummies", Wiley, 2009.
2. Gautam Shroff, "Enterprise Cloud Computing", Cambridge, 2010.
3. Ronald Krutz and Russell Dean Vines, "Cloud Security: A Comprehensive Guide to Secure Cloud Computing", Wiley, 2010.

## REFERENCE BOOKS

1. Scott Granneman, "Google Apps Deciphered: Compute in the Cloud to Streamline Your Desktop", Pearson Education, 2008.
2. Tim Malhar, S.Kumaraswamy, S.Latif, "Cloud Security & Privacy", O'Reilly, 2009.
3. Toby Velte, Anthony Velte, Robert Elsenpeter, "Cloud Computing : A Practical Approach", McGraw Hill, 2009.
4. Barrie Sosinsky, "Cloud Computing Bible", Wiley, 2011.

## CS2852 SOFTWARE AGENTS

L T P C  
3 0 0 3

### GOAL

To learn the properties of software agent and develop agents for different applications.

### OBJECTIVES

The course should enable the students to:

1. Study agent and user experience of agents.
2. Study agents for learning in intelligence assistance.
3. Study agent communication and collaboration.
4. Study about the agent architecture and mobile agents.

### OUTCOME

The students should be able to:

1. Understand the usage of agents for information sharing and coordination.
2. Implement agents.
3. Understand the agent architecture.

### UNIT I AGENT AND USER EXPERIENCE

9

Interacting with Agents - Agent From Direct Manipulation to Delegation - Interface Agent Metaphor with Character - Designing Agents - Direct Manipulation versus Agent Path to Predictable.

### UNIT II AGENTS FOR LEARNING IN INTELLIGENT ASSISTANCE

9

Agents for Information Sharing and Coordination - Agents that Reduce Work Information Overhead - Agents without Programming Language - Life like Computer character - S/W Agents for cooperative Learning - Architecture of Intelligent Agents.

### UNIT III AGENT COMMUNICATION AND COLLABORATION

9

Overview of Agent Oriented Programming - Agent Communication Language - Agent Based Framework of Interoperability.

**UNIT IV AGENT ARCHITECTURE****9**

Agents for Information Gathering - Open Agent Architecture - Communicative Action for Artificial Agent.

**UNIT V MOBILE AGENTS****9**

Mobile Agent Paradigm - Mobile Agent Concepts - Mobile Agent Technology - Case Study: Tele Script, Agent Tel.

**TOTAL: 45****TEXT BOOKS**

1. Jeffrey M. Bradshaw, "Software Agents", MIT Press, 2000. (Unit 1,2,3 & 4)
2. William R. Cockayne, Michael Zyda, "Mobile Agents", Prentice Hall, 1998 (5th Unit)

**REFERENCE BOOKS**

1. Russel & Norvig, "Artificial Intelligence: A Modern Approach", Prentice Hall, 2nd Edition, 2002.
2. Joseph P. Bigus & Jennifer Bigus, "Constructing Intelligent agents with Java: A Programmer's Guide to Smarter Applications", Wiley, 1997.

**CS2853 GENETIC ALGORITHMS**

<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>

**GOAL**

To learn Genetic operators and modeling through genetic algorithms.

**OBJECTIVES**

The course should enable the students to :

1. Study the operators used in genetic algorithms.
2. Study evolutionary combinatorial optimization in genetic algorithms.
3. Learn to handle constraints in genetic programming.
4. Study genetic programming.

**OUTCOME**

The students should be able to:

1. Demonstrate the basic terminologies of Genetic Algorithms and its applications.
2. Apply GA principles to real life problem.

**UNIT I INTRODUCTION TO GENETIC ALGORITHM 9**

Introduction to Genetic Algorithm - History - Basic concepts - Creation of Off-springs - Working principle- Encoding - binary encoding - octal encoding - hexadecimal encoding - permutation encoding- valueencoding - tree encoding - fitness function.

**UNIT II OPERATORS 9**

Reproduction- Roulette-wheel Selection - Boltzman Selection - Tournament Selection-Rank Selection - Steady-state selection - Elitism - generation gap and steady-state selection - Inheritance operators - Crossover-Single-point crossover - Two-point cross over - Multi-point cross over - Uniform Cross over - Matrix CrossOver - Cross Over rate - Mutation operators - mutation - mutation rate.

**UNIT III GENETIC MODELLING 9**

Inversion and deletion : Inversion - deletion and duplication - deletion and regeneration - segregation - crossover and inversion - Bit-wise operators - one's complement operator - logical bit-wise operators - shiftoperators - bit-wise operators used in GA - generational cycle - convergence of GA - Differences and Similarities between GA and Other Traditional Methods.

**UNIT IV APPLICATIONS OF GA 9**

The rise of GA - GA application of Historical Interaction. - Dejung& Function optimization - Currentapplications of GA -Techniques in genetic search :Dominance, Diploidy& abeyance -Niche & Speciation -Multi objective optimization - Knowledge-Based Techniques. - GA & parallel processes- Real Life Problem.

**UNIT V GENETICS-BASED MACHINE LEARNING 9**

Genetics - Based Machined learning - Classifier system - Rule & Message system - Apportionment of credit:The bucket brigade - Genetic Algorithm - A simple classifier system in Pascal. - Results using the simpleclassifier system-The Rise of GBMC - Development of CS-1, the first classifier system. - Smitch's Pokerplayer-Current Applications.

**TOTAL: 45**

**TEXT BOOKS**

1. David E. Gold berg, "Genetic Algorithms in Search, Optimization & Machine Learning", PearsonEducation, 2001.
2. S.Rajasekaran, G.A.VijayalakshmiPai, " Neural Networks, Fuzzy Logic and Genetic Algorithms", Pearson Education , 2003.

**REFERENCE BOOK**

1. KalyanmoyDeb , "Optimization for Engineering Design , Algorithms and examples" PHI 1995.

## CS2854 COMPUTER VISION

L T P C  
3 0 0 3

### GOAL

To gain knowledge on Computer Vision and its applications.

### OBJECTIVES

The course should enable the students to:

1. Provide a general introduction in the field of Computer Vision.
2. Teach mathematical concepts and techniques.
3. Solve real vision problems.

### OUTCOME

The students should be able to:

1. Explain various image models
2. Apply segmentation and various levels of computer vision.

### UNIT I RECOGNITION METHODOLOGY

9

Recognition Methodology: Conditioning, Labeling, Grouping, Extracting, and Matching. Edge detection, Gradient based operators, Morphological operators, Spatial operators for edge detection. Thinning, Region growing, region shrinking, Labeling of connected components.

### UNIT II BINARY MACHINE VISION

9

Binary Machine Vision: Thresholding, Segmentation, Connected component labeling, Hierarchical segmentation, Spatial clustering, Split & merge, Rule based Segmentation, Motionbased segmentation.

### UNIT III BINARY AREA EXTRACTION AND REGION ANALYSIS

9

Area Extraction: Concepts, Data structures, Edge, Line Linking, Hough transform, Line fitting, Curve fitting (Least square fitting). Region Analysis: Region properties, External points, Spatial moments, Mixed spatial gray level moments, Boundary analysis: Signature properties, Shape numbers.

### UNIT IV OBJECT MODEL RECOGNITION AND MATCHING

9

Facet Model Recognition: Labeling lines, Understanding line drawings, Classification of shapes by labeling of edges, Recognition of shapes, consisting labeling problem, Back tracking, Perspective Projective geometry, Inverse perspective Projection, Photogrammetry. From 2D to 3D, Image matching : Intensity matching of ID signals, Matching of 2D image, Hierarchical image matching. Object Models and Matching: 2D representation, Global vs. Local features.

### UNIT V GENERAL FRAMEWORKS AND KNOWLEDGE BASED VISION

9

General Frame Works For Matching: Distance relational approach, Ordered structural matching, View class matching, Models database organization. General Frame Works: Distance .relational

approach, Ordered .Structural matching, View class matching, Models database organization. Knowledge Based Vision: Knowledge representation, Control?strategies, Information Integration.

**TOTAL: 45**

**TEXT BOOKS**

1. David A. Forsyth, Jean Ponce, "Computer Vision: A Modern Approach", Prentice Hall, 2003.
2. R. Jain, R. Kasturi, and B. G. Schunk, "Machine Vision", McGraw?Hill, 1995.

**REFERENCE BOOKS**

1. Milan Sonka, Vaclav Hlavac, Roger Boyle, "Image Processing, Analysis, and Machine Vision", Thomson Learning.
2. Robert Haralick and Linda Shapiro, "Computer and Robot Vision", Vol I, II, Addison Wesley, 1993.
3. Y Shirai, "Three Dimensional Computer Vision", Springer Verlag, 1987.
4. Wechsler, "Computational Vision", Academic Press, 1987.

**CS2855 INFORMATION SECURITY**

**L T P C**  
**3 0 0 3**

**GOAL**

To gain knowledge on information security and its impact on information systems.

**OBJECTIVES**

The course should enable the students to:

1. Understand the basics of Information Security.
2. Know the legal, ethical and professional issues in Information Security.
3. Know the aspects of risk management.
4. Become aware of various standards in this area.
5. Know the technological aspects of Information Security.

**OUTCOME**

The students should be able to:

1. Understand security components.
2. Perform security analysis and audit.
3. Prepare the blueprint of a security architecture of a system.

**UNIT I INTRODUCTION**

**9**

History, Critical Characteristics of Information, NSTISSC Security Model, Components of an Information System, Securing the Components, Balancing Security and Access, The SDLC, The Security SDLC.

**UNIT II SECURITY INVESTIGATION 9**

Need for Security, Business Needs, Threats, Attacks, Legal, Ethical and Professional Issues.

**UNIT III SECURITY ANALYSIS 9**

Risk Management : Identifying and Assessing Risk, Assessing and Controlling Risk.

**UNIT IV LOGICAL DESIGN 9**

Blueprint for Security, Information Security Policy, Standards and Practices, ISO 17799/BS 7799, NIST Models, VISA International Security Model, Design of Security Architecture, Planning for Continuity.

**UNIT V PHYSICAL DESIGN 9**

Security Technology, IDS, Scanning and Analysis Tools, Cryptography, Access Control Devices, Physical Security, Security and Personnel.

**TOTAL : 45**

**TEXT BOOK**

1. Michael E Whitman and Herbert J Mattord, "Principles of Information Security", Vikas Publishing House, New Delhi, 2003.

**REFERENCE BOOKS**

1. Micki Krause, Harold F. Tipton, " Handbook of Information Security Management", Vol 1-3 CRC Press LLC, 2004.
2. Stuart McClure, Joel Scrambray, George Kurtz, "Hacking Exposed", Tata McGraw-Hill, 2003
3. Matt Bishop, " Computer Security Art and Science", Pearson Education, 2002.

**ELECTIVE - 5 (SEMESTER VIII)  
CS2856 SOFTWARE QUALITY ASSURANCE**

**L T P C  
3 0 0 3**

**GOAL**

To introduce an integrated approach to software development incorporating quality assurance methodologies.

**OBJECTIVES**

The course should enable the students to:

1. Learn the concepts of quality management.
2. Understand what quality standard is.
3. Study the Pareto principles and quality techniques.
4. Understand Software audit and cost.
5. Study the software quality assurance metrics.

## OUTCOME

The students should be able to:

1. Gain the knowledge in quality management, program and experience from experts.
2. Obtain understanding in standards and training.
3. Learn the pareto principles and quality techniques.
4. Grasp the concepts of software audit and cost of software quality system.
5. Be confident in software quality.

### **UNIT I SOFTWARE QUALITY IN BUSINESS CONTEXT 9**

Software Quality in Business Context : The meaning of Quality, The quality challenge, Why is Quality important, Quality control vs. Quality Assurance at each phase of SLDC, Quality Assurance in Software Support projects, The SQA function (Nina. S. Godbole). Software Quality Assurance: + Quality Concepts - Quality, Quality control, Quality Assurance, Cost of Quality. Software Quality Assurance Background issues, SQAActivities, Software Reviews - Cost impact of Software Defects, Defect Amplification and removal. Formal Technical reviews- The review meeting, Review reporting abd Record keeping, Review guidelines, Sample-driven reviews. Formal Approaches to SQA, Software Reliability - Measures of Reliability and Availability, Software Safety. The SQA plan. (Pressman).

### **UNIT II PRODUCT QUALITY AND PROCESS QUALITY 9**

Product Quality and process Quality: Introduction, Software Systems evolution, Product Quality, Models for product Quality, Process Quality, Software Measurement and Metrics: Introduction, Measurement during Software Life cycle Context, Defect Metrics, Metrics for Software Maintenance, Classification of Software Metrics, Requirements related metrics, Measurements and Process Improvement, Measurement principles, Identifying appropriate Measures and Metrics for Projects, Metrics implementation in projects, Earned Value Analysis, Issues in Software Measurements and Metrics program implementation, Object- Oriented Metrics: An Overview (Godbole).

### **UNIT III ISO 9000 FAMILY AND SIX SIGMA 9**

ISO 9001: ISO 9000, ISO Standards Development Process. ISO 9000 family of standards, ISO 9001:2000, ISO Certification Surveillance Audits/RE-certification/Re-Assessment Audits. Six Sigma- Introduction, Six sigma in statistical context.

### **UNIT IV CMM AND PROCESS IMPROVEMENT MODELS 9**

Software CMM and other process improvement models: CMM for software- an overview. Practices followed at mature organizations, Types of CMMs, CMM-Integrated model - What is CMM-I, Background to the CMNMODEL, Types of CMM-I models, Other models for Software Process Improvement and excellence - ISO 12207, IEEE 1074, Malcom Baldrige National Quality Award, The EFQM Excellence Model, People - CMM.

### **UNIT V SOFTWARE TESTING 9**

Software Testing - Overview, Purpose of Testing, Differences between Inspection and Testing, Testing vs Debugging, Testing Life Cycle, Test Artifacts, The Test Plan, The V-Model for testing Phases,



Testing Techniques - Equivalence partitioning, Boundary value Analysis, State Transition Analysis , GUI Testing, Performance Testing, Reliability Testing, Risk-based testing. Gray Box Testing, Extreme testing, Test process improvement framework.

**TOTAL: 45**

**TEXT BOOK**

1. Nina S Godbole, "Software Quality Assurance: Principles and Practice", Narosa Publishing House, 2004.

**REFERENCE BOOKS**

1. Roger S. Pressman, "Software Engineering: A Practitioner's Approach", 6th Ed., McGraw-Hill, 2005.
2. Alka Jarvis and Vern Crandall, "In Roads to Software Quality: How to guide and toolkit", Prentice-Hall, 1997.
3. Pankaj Jalote, "Software Engineering Principles", Narosa Publishing House, 2000.
4. Richard Fairley, 'Software Engineering concepts', Tata McGraw-Hill, 2001.

**CS2857 TCP/IP DESIGN AND IMPLEMENTATION**

**L T P C**  
**3 0 0 3**

**GOAL**

To impart networking knowledge and make the students to understand experimental methodology.

**OBJECTIVES**

The course should enable the students to:

1. Understand the internals of the TCP/IP Protocols.
2. Understand how TCP/IP is actually implemented.
3. Understand the interaction among the protocols in the protocol stack.
4. Understand about routing protocols.
5. Understand about subnets and super nets.

**OUTCOME**

The students should be able to:

1. Gain well founded knowledge of networks.
2. Exercise TCP/IP protocol design alternatives and implementation techniques.
3. Demonstrate various protocols and their interactions in the protocol stack.
4. Learn about the implementation of super nets and subnets.

**UNIT I INTRODUCTION TO COMPUTER NETWORK, DATA COMMUNICATION, STANDARDS 9**

Protocols, Reference model OSI layer concept, Functionality of Various layers in OSI reference model, TCP/IP suite, Difference between OSI and TCP/IP suite, Pitfalls of layer concepts, Standards, IEEE, ISO, ITU, IETF, IRTF, Addressing - Ipv4, IPv6, advantages, Underlying technology, Switch, Bridge, Router, repeater, Hub, Ethernet, gigabyte Ethernet, frame format, Under layer technology, ADSL, Modem, WLAN.

**UNIT II IP ADDRESSES, ROUTING, ARP AND RARP 9**

IP addressing methods, Classful addressing, Class A,B,C,D,E, Issues of IP addressing, Subnetting, Subnet masking, Superneting, CIDR, Routing, various types of forwarding techniques, Routing Table, Architecture of Router, ARP input module, output module, cache module, ARP package, RARP.

**UNIT III IP, ICMP, IGMP AND UDP 9**

IP datagram format - Fragmentation, option field, checksum, IP package, ICMP messages, type of messages, message format, ICMP package, IGMP messages, type of messages, Message format, IGMP operation, joining, leaving from group, IGMP package, UDP packet format, operation, UDP package.

**UNIT IV TCP, UNICAST AND MULTICAST ROUTING PROTOCOLS 9**

Flow control, sliding window protocol, silly window syndrome, Slow start algorithm, Error control, TCP packet format, operation, TCP packages, State transition diagram of TCP protocol, Unicast routing protocol, RIP, OSPF, BGP, Multi cast routing protocol, MOSPF, CBT, PIM.

**UNIT V APPLICATION LAYER, SOCKETS 9**

Client server model, Concurrency, socket, byte ordering, Socket system calls, Socket programming and primitives, TCP, UDP client server program, BOOTP, DHCP, DNS Name space, Type of records, mode of operation, Rlogin.

**TOTAL: 45**

**TEXT BOOKS**

1. Behrouz Forouzan, "TCP/IP protocol suite", 4th Edition, Tata McGraw Hill, 2009.
2. Douglas Comer, "Internetworking with TCP / IP", Volume 1, Prentice Hall, 2000.

**REFERENCE BOOKS**

1. W. ER. Stevens, "TCP/IP illustrated, Vol. 1: The protocols", Addison Wesley, 1994.
2. G.R.Wright, "TCP/IP illustrated Vol. 2, The Implementation", Addison Wesley, 1995.

## CS2858 REALTIME SYSTEMS

L T P C  
3 0 0 3

### GOAL

To learn specification and design techniques of a realtime systems.

### OBJECTIVES

The course should enable the students to:

1. Know about the specification and design techniques of a Real Time System.
2. Understand real time task communication and synchronization
3. Have a vast knowledge of queuing models and Real Time System integration.

### OUTCOME

The student should be able to:

1. Explain the basic concepts, design and integration of Real Time Systems.
2. Demonstrate the working of realtime systems.

### UNIT I BASIC REAL TIME CONCEPTS

9

Basic computer architecture - some terminology - real time design issues - example real time systems - input and output - other devices - language features.

### UNIT II REAL TIME SPECIFICATION AND DESIGN TECHNIQUES

9

Natural languages - mathematical specification - flow charts - structured charts - pseudocode and programming design languages - finite state automata - data flow diagrams - petri nets - Warnier Orr notation - state charts - polled loop systems - phase / sate driven code - coroutines - interrupt - driven systems - foreground/background system - full featured real time operating systems.

### UNIT III INTERTASK COMMUNICATION AND SYNCHRONIZATION

9

Buffering data - mailboxes - critical regions - semaphores - deadlock - process stack management - dynamic allocation - static schemes - response time calculation - interrupt latency - time loading and its measurement - scheduling is NP complete - reducing response times and time loading - analysis of memory requirements - reducing memory loading - I/O performance.

### UNIT IV QUEUING MODELS

9

Probability functions - discrete- basic buffering calculation - classical queuing theory - little's law - erlong's formula - faults, failures, bugs and effects - reliability-testing - fault tolerance - classification of architecture - distributing systems - Non Von Neuman architecture.

### UNIT V HARDWARE/SOFTWARE INTEGRATION

9

Goals of real time system integration - tools - methodology -software Heinsbergun certainty principle - real time applications.

**TOTAL: 45**

### TEXT BOOKS

1. Philip A.Laplante, "Real time system design and analysis - an engineer's handbook", 3rd edition, A John-Wiley and Sons, Inc., Publication, 2004.
2. C.M.Krishna and Kang G Shin, "Real time systems", TMH, 1997

### REFERENCE BOOKS

1. Stuart Bennelt, "Real time computer control - and introduction", Pearson education, 2003.
2. Allen Burns, Andy Wellings, "Real Time Systems and Programming Languages", Pearson Education, 2003.

## CS2859 HIGH SPEED NETWORKS

L T P C  
3 0 0 3

### GOAL

To exhibit familiarity with the fundamental concepts of real time systems.

### OBJECTIVES

The course should enable the students to:

1. Know about the various standards adopted for handling high traffic.
2. Have a primitive level performance analysis for few network constraints for various amount traffic with different networking standards.
3. Get a feel of designing a High speed network setup with specialized hardware and optimization approaches like parallelism and pipelining.

### OUTCOME

The students should be able to:

1. Provide an understanding of the networking standards that can be adopted with the current day requirements of complex and voluminous content transfer over heterogeneous platforms.

### UNIT I HIGH SPEED NETWORKS

9

Frame Relay Networks - Asynchronous transfer mode - ATM Protocol Architecture, ATM logical Connection - ATM Cell - ATM Service Categories - AAL. High Speed LAN's: Fast Ethernet - Gigabit Ethernet- Fibre Channel - Wireless LANs.

### UNIT II CONGESTION AND TRAFFIC MANAGEMENT

9

Queuing Analysis - Queuing Models - Single Server Queues - Effects of Congestion - Congestion Control - Traffic Management - Congestion Control in Packet Switching Networks - Frame Relay Congestion Control.

**UNIT III ATM CONGESTION CONTROL****9**

Performance of TCP over ATM. Traffic and Congestion control in ATM - Requirements - Attributes - Traffic Management Frame work, Traffic Control - ABR traffic Management - ABR rate control, RM cell formats - ABR Capacity allocations - GFR traffic management.

**UNIT IV OPTICAL NETWORKS****9**

SONET/SDH-Optical wavelength routing networks-Optical Cross connects and Burst Switching-PONS- Intelligent optical networks-IP over WDM networks.

**UNIT V DESIGN TECHNIQUES****9**

Design principles and trade offs-End-to-End Vs Hop-by-Hop-Control Mechanisms -Design techniques-Scaling time and space-specialized hardware implementation-parallelism and pipelining-data structure optimization -latency reduction. Future trends: Changing resource tradeoffs-technology and applications.

**TOTAL: 45****TEXT BOOKS**

1. William Stallings, "High Speed Networks and Internet", 2nd Edition, Pearson Education, 2002. (Unit 1,2 and 3)
2. Warland, PravinVaraiya, "High Performance Communication Networks", 2nd Edition , Jean Harcourt Asia Pvt. Ltd., 2001. (Unit 4)
3. James P.G Sterbenz and Joseph D.Touch "High Speed Networking: A Systematic Approach to High-Bandwidth Low Latency Communication", Wiley, 2001 (Unit 5).

**REFERENCE BOOKS**

1. IrvanPepelnjk, Jim Guichard, Jeff Aparcar, "MPLS and VPN Architecture", Cisco Press, Volume 1 and 2, 2003.
2. Abhijit S. Pandya, Ercan Sea, "ATM Technology for Broad Band Telecommunication Networks", CRC Press, New York, 2004.

**MG2002 TOTAL QUALITY MANAGEMENT****L T P C  
3 0 0 3****GOAL**

To learn the principles and tools available to achieve Total Quality Management and also to understand the statistical approach for quality control.

**OBJECTIVES**

The course should enable the students to:

1. Understand the basic concepts of Total Quality Management.
2. Be familiar with the total quality management principles.

3. Know about the various process control tools available to achieve Total Quality Management.
4. Study about quality function deployment and total productive maintenance.
5. Get awareness about the ISO certification process and their need in various industries.

### **OUTCOME**

The students should be able to:

1. Be aware of the various dimensions of quality, costs, leadership, philosophy and barriers to implement TQM.
2. Have a clear understanding of customer satisfaction, employee involvement, continuous process improvement, supplier partnership and performance measures.
3. Apply the various Quality tools and statistical fundamentals.
4. To carry out the various aspects of benchmarking, deploy the quality functions and to deal with the total productive maintenance.
5. Assure and ensure the various quality standards and to implement the related quality systems.

### **UNIT I INTRODUCTION 9**

Definition of Quality, Dimensions of Quality, Quality Planning, Quality costs - Analysis Techniques for Quality Costs, Basic concepts of Total Quality Management, Historical Review, Principles of TQM, Leadership - Concepts, Role of Senior Management, Quality Council, Quality Statements, Strategic Planning, Deming Philosophy, Barriers to TQM Implementation.

### **UNIT II TQM PRINCIPLES 9**

Customer satisfaction - Customer Perception of Quality, Customer Complaints, Service Quality, Customer Retention, Employee Involvement - Motivation, Empowerment, Teams, Recognition and Reward, Performance Appraisal, Benefits, Continuous Process Improvement - Juran Trilogy, PDCA Cycle, 5S, Kaizen, Supplier Partnership - Partnering, sourcing, Supplier Selection, Supplier Rating, Relationship Development, Performance Measures - Basic Concepts, Strategy, Performance Measure.

### **UNIT III STATISTICAL PROCESS CONTROL (SPC) 9**

The seven tools of quality, Statistical Fundamentals - Measures of central Tendency and Dispersion, Population and Sample, Normal Curve, Control Charts for variables and attributes, Process capability, Concept of six sigma, New seven Management tools.

### **UNIT IV TQM TOOLS 9**

Benchmarking - Reasons to Benchmark, Benchmarking Process, Quality Function Deployment (QFD) - House of Quality, QFD Process, Benefits, Taguchi Quality Loss Function, Total Productive Maintenance (TPM) - Concept, Improvement Needs, FMEA - Stages of FMEA.

### **UNIT V QUALITY SYSTEMS 9**

Need for ISO 9000 and Other Quality Systems, ISO 9000:2000 Quality System - Elements, Implementation of Quality System, Documentation, Quality Auditing, TS 16949, ISO 14000 - Concept, Requirements and Benefits.

**TOTAL: 45**

### **TEXT BOOK**

1. Dale H.Besterfield, et al., Total Quality Management, Pearson Education, 2003.

### **REFERENCE BOOKS**

1. James R.Evans & William M.Lindsay, The Management and Control of Quality, (5th Edition), South-Western (Thomson Learning), 2002 (ISBN 0-324-06680-5).
2. Feigenbaum.A.V. "Total Quality Management, McGraw Hill, 1991.
3. Oakland.J.S. "Total Quality Management Butterworth - Hcinemann Ltd., Oxford. 1989.
4. Narayana V. and Sreenivasan, N.S. Quality Management - Concepts and Tasks, New Age International 1996.