ANNAMALAI UNIVERSITY

ANNAMALAINAGAR

FACULTY OF SCIENCE

DEPARTMENT OF COMPUTER AND INFORMATION SCIENCE

(Syndicate Resolution No. 3 dated 15.12.2015)

M.Sc. INFORMATION TECHNOLOGY

Five Year Integrated Degree Programme

(Credit Based Semester System)

HAND BOOK

2015 – 2016 ONWARDS

ANNAMALAI UNIVERSITY

FACULTY OF SCIENCE

DEPARTMENT OF COMPUTER AND INFORMATION SCIENCES

FIVE YEAR INTEGRATED

M.Sc. INFORMATION TECHNOLOGY

(Credit Based Semester System)

REGULATIONS AND SYLLABUS

(2015 – 2016)

Regulations for students admitted from 2015 – 2016

Common to all Departments of Studies in the Faculty of Science

Mathematics, Statistics, Physics, Chemistry, Botany, Zoology, Earth Sciences, Bio Chemistry, Microbiology, Computer and Information Sciences.

Master's Programme

A Master's Programme consists of a number of courses, in M.Sc. A Master's programme consists of a set of compulsory courses and Language Papers.

The entire course carries credit system. The number and distribution of credits for the courses will be decided by the respective faculties.

A Course is divided into two Semesters, Odd Semester and Even Semester.

Credits

The term credit is used to describe the quantum of syllabus for various programmes in terms and hours of study. It indicates differential weightage given according to the contents and duration of the courses in the Curriculum design.

The minimum credit requirement for the award of the Degree of Five Years Master's Programme shall be 225.

Courses

Each course may consist of Lectures/ Tutorials/ Laboratory work/ Seminar/ Project work/ Practical training report/ Viva voce etc.

Normally, in each of the courses, credits will be assigned on the basis of the Lectures/ Tutorials/ Laboratory work and other form of learning in a 18 week scheme schedule.

Eligibility for Admission

Candidates for admission to the first year of the Five Year Integrated M.Sc. Degree Course shall be required to have passed the final examination of the plus 2 Higher Secondary Course or Equivalent thereto with a minimum of 50% aggregate under academic stream with the following

subjects as in Appendix - A, conducted by the Board of Secondary Education, Tamilnadu Government or an examination of any other authority accepted by the Syndicate of this University as equivalent thereto. They shall satisfy the conditions regarding qualifying marks, age and physical fitness as may be prescribed by the Syndicate of the Annamalai University from time to time.

Grading System

The term Grading system indicates a 10 point scale of evaluation of the performance of students in terms of marks, grade points, letter grade and class.

Course Duration

The duration for completion of a Five Year Integrated M.Sc. Programme in any course is Ten Semesters.

Student Counselors

To help the students in planning their course of study and for general advice on the academic programme, the Head of the Department will attach a certain number of students to a member of the faculty who shall function as student counselor for those students throughout their period of study.

Attendance

Every teaching faculty handling a course shall be responsible for the maintenance of Attendance Register for candidates who have registered for the course.

The instructor of the course must intimate the Head of the Department at least Seven Calender days before the last instruction day in the semester about the particulars of all students who have secured an attendance of less than 80%.

A candidate who has attendance less than 80% shall not be permitted to sit for the End-Semester Examination in the course in which the shortage exists.

However, it shall be open to the authorities to grant exemption to a candidate who has failed to obtain the prescribed 80% attendance for valid reasons on payment of a condonation fee and such exemptions should not under any circumstances be granted for attendance below 70%.

Examination

There will be two sessional assessments and one End-Semester Examination during each semester.

Sessional Test - I will be held during Sixth Week for the syllabi covered till then.

Sessional Test - I will be combination of a variety of tools such as class test, assignment and paper presentation that would be suitable to the course. This requires an element of openness. The students are to be informed in advance about the nature of assessment and the procedures. However,

the tests are compulsory. Test-I may be for one hour duration. The pattern of question paper will be decided by the respective Faculty. Sessional Test-I will carry 12.5% of marks of the entire course.

Sessional Test - II will be conducted with a variety of assessment tools. It will also have an element of openness. The student are to be informed in advance about nature of assessment and the procedures. However the tests are compulsory. Test II may be for two hours duration. The pattern of question paper will be decided by the respective Faculty. Sessional Test - II will carry 12.5% of marks of the entire course.

There will be one End Semester Examination of 3 hours duration in each course.

The end semester Examination will cover all the syllabus of the course for 75% of marks.

Evaluation

Evaluation will be done by a continuous basis. Evaluation may be Objective Type Questions, Quiz, Short Answers, Essays or a combination of these, but at the End Semester it has to be a Written Examination.

The performance of students in each course is evaluated in terms of percentage of marks (PM) with a provision for conversion of Grade point (GP). The sum total performance in each semester will be rated by GPA while the continuous performance from the 2nd Semester onwards will be marked by OGPA.

Marks and Grading

A student cannot repeat the assessment of Sessional Test - I and Sessional Test - II. However, if for any compulsive reason the student could not attend the test, the prerogative of arranging a special test lies with the teacher in consultation with the Head of the Department.

A minimum of 50% marks in each course is prescribed for a pass. A student has to secure 50% minimum in the End Semester Examinations.

If a candidate who has not secured a minimum of 50% of marks in a course shall be deemed to have failed in that course.

The student can repeat the End Semester Examination when it is offered next in the subsequent Odd/Even Semesters till the regulations are in force. However, a candidate cannot move to the next odd/even semester if he/she has more than six papers as arrears at any point of time.

A candidate who has secured a minimum of 50% marks in all courses prescribed in the programme and earned a minimum of the credits will be considered to have passed the Master's Programme.

Grading

A ten point rating is used for the evaluation of the performance of the student to provide letter grade for each course and overall grade for the Master's Programme.

Marks	Grade point	Letter grade	Class
90+	10	S	Exemplary
85-89	9.0	D++	Distinction
80-84	8.5	D+	Distinction
75-79	8.0	D	Distinction
70-74	7.5	A++	First Class
65-69	7.0	A+	First Class
60-64	6.5	A	First Class
55-59	6.0	B	Second Class
50-54	5.5	C	Second Class
49 or Less		F	Fail

The Successful candidates in the Core Subjects are classified as follows.

I-Class 60% marks and above in over all percentage of marks (OPM)

II-Class 50-59% marks in over all percentage of marks.

Candidates who obtain 75% and above but below 90% of marks (OPM) shall be deemed to have passed the examination in First Class (Distinction) provided he/she passes all the courses prescribed for the programme at the first appearance.

Candidates who obtain 90% and above (OPM) shall be deemed to have passed the examination in First Class (Exemplary) provided he/she passes all the courses prescribed for the programme at the first appearance.

Candidates who obtain highest marks in all examinations at the first appearance alone considered for ranking.

For the Internal Assessment Evaluation the break up marks shall be as follows:

Theory	**Marks**	**Practical**	**Marks**
Test – I	10	Test – I	15
Test – II	10	Test – II	15
Assignment	5	Record	10
Total	**25**	**Total**	**40**

The Project work will be assessed for 50 marks by a committee consisting of the Head of the Department, the guide and a minimum of two members nominated by the Head of the Department. The Head of the Department will be the chairman. 150 marks are allotted for the project work and viva-voce examination at the end of the semester.

Course-Wise Letter Grades

The percentage of marks obtained by a candidate in a course will be indicated in a letter grade.

A Student is considered to have completed a course successfully and earned the credits if he/she secures over all grades other than F. A letter grade F in any course implies a failure in that course. A course successfully completed cannot be repeated for the purpose of improving the Grade Point.

The F Grade once awarded stays in the grade card of the student and is not deleted even when he/she completes the course successfully later. The grade acquired later by the student will be indicated in the grade sheet of the Odd/Even semester in which the candidate has appeared for clearance of the arrears.

If a student secures F grade in the Project Work/ Field Work/ Practical Work/ Dissertation, either he/she shall improve it and resubmit it if it involves only rewriting incorporating the clarification of the evaluators or he/she can re-register and carry out the same in the subsequent semesters for evaluation.

Transitory Regulations

Wherever there had been change of syllabi, examinations based on the existing syllabus will be conducted for three consecutive times after implementation of the new syllabus in order to enable the students to clear the arrears. Beyond that the students will have to take up their examinations in equivalent subjects, as per the new syllabus, on the recommendations of the Head of the Department concerned.

APPENDIX-A

M. Sc. Information Technology	:	A Pass in H.Sc. (10+2 level) and Equivalent thereto under academic stream with the following subjects viz. Mathematics, Physics, Chemistry and Computer Science.

M.Sc. INFORMATION TECHNOLOGY
FIVE YEAR INTEGRATED DEGREE
ON–CAMPUS PROGRAMME (CBSS)

SUBJECTS OF STUDY AND SCHEME OF EXAMINATIONS

FIRST SEMESTER

Code	Subject	L	T	P	Exam Duration in hours	Exam Marks	Sess. Marks	Total Marks	Credit points
ITAC 11	செய்யுளும் உரைநடையும் /Hindi–I	3	–	–	3	75	25	100	3
IENC 12	English Through Literature I: Prose	3	–	–	3	75	25	100	3
ICEC 13	Civics, Environmental and Health Sciences	3	–	–	3	75	25	100	3
IMAC 14	Mathematics–I	4	–	–	3	75	25	100	4
IAPC 15	Applied Physics	4	–	–	3	75	25	100	4
Total		**17**	–	–		**375**	**125**	**500**	**17**

SECOND SEMESTER

ITAC 21	பயன்பாட்டுத்தமிழும் செம்மொழி வரலாறும் /Hindi–II	3	–	–	3	75	25	100	3
IENC 22	English Through Literature II: Poetry	3	–	–	3	75	25	100	3
IMAC 23	Mathematics–II	4	–	–	3	75	25	100	4
IITT 24	Analog and Digital Electronics	4	–	–	3	75	25	100	4
IITT 25	Programming in C	5	–	–	3	75	25	100	5
IITP 26	Programming in C - Lab	–	–	4	3	60	40	100	2
Total		**20**	–	**4**		**435**	**165**	**600**	**21**

THIRD SEMESTER

ITAC 31	உரைநடையும் நாடகமும் /Hindi–III	3	–	–	3	75	25	100	3
IENC 32	English Through Literature III: Drama	3	–	–	3	75	25	100	3
IMAC 33	Mathematics–III	4	—	–	3	75	25	100	4
IITT 34	Principles of Communications	5	–	–	3	75	25	100	5
IITT 35	Data Structures	5	–	–	3	75	25	100	5
IITP 36	Data Structure - Lab	-	–	4	3	60	40	100	2
Total		**20**	—	**4**		**435**	**165**	**500**	**22**

FOURTH SEMESTER

Code	Subject	L	T	P	Exam Duration in hours	Exam Marks	Sess. Marks	Total Marks	Credit points
ITAC 41	தமிழிலக்கிய வரலாறு /Hindi–IV	3	–	–	3	75	25	100	3
IENC 42	English Through Literature IV: Short Story	3	–	–	3	75	25	100	3
IMAC 43	Resource Management Techniques	4	–	–	3	75	25	100	4
IITT 44	Software Engineering	5	–	–	3	75	25	100	5
IITT 45	Data Base Management System	5	–	–	3	75	25	100	5
IITT 46	Microprocessor and its Applications	5	–	–	3	75	25	100	5
IITP 47	DBMS- Lab	-	–	4	3	60	40	100	2
Total		**25**	**–**	**4**		**510**	**185**	**700**	**27**

FIFTH SEMESTER

Code	Subject	L	T	P	Exam Duration in hours	Exam Marks	Sess. Marks	Total Marks	Credit points
IITT 51	Object Oriented Programming using C++	5	–	–	3	75	25	100	5
IITT 52	Operating System	5	–	–	3	75	25	100	5
IITT 53	System Software	5	–	–	3	75	25	100	5
IITT 54	Visual Programming	5	–	–	3	75	25	100	5
IITP 55	Visual Programming - Lab	–	–	4	3	60	40	100	2
IITP 56	Programming in 'C++' - Lab	–	–	4	3	60	40	100	2
Total		**20**	**–**	**8**		**420**	**180**	**600**	**24**

SIXTH SEMESTER

Code	Subject	L	T	P	Exam Duration in hours	Exam Marks	Sess. Marks	Total Marks	Credit points
IITT 61	Programming in Java	5	–	–	3	75	25	100	5
IITT 62	Computer Graphics	5	–	–	3	75	25	100	5
IITT 63	Design and Analysis of Algorithm	5	–	–	3	75	25	100	5
IITT 64	Computer Networks	5	–	–	3	75	25	100	5
IITP 65	Graphics - Lab	–	–	4	3	60	40	100	2
IITP 66	Programming in Java - Lab	–	–	4	3	60	40	100	2
Total		**20**		**8**		**420**	**180**	**600**	**24**

SEVENTH SEMESTER

Code	Subject	L	T	P	Exam Duration in hours	Exam Marks	Sess. Marks	Total Marks	Credit points
IITT 71	Object Oriented Analysis and Design	5	–	–	3	75	25	100	5
IITT 72	Web Technology	5	–	–	3	75	25	100	5
IITT 73	Soft Skills Development	2	2	–	3	75	25	100	4
IITE 74	Elective–I	5	–	–	3	75	25	100	5
IITP 75	Software Design - Lab	–	–	4	3	60	40	100	2
IITP 76	Web Technology - Lab	–	–	4	3	60	40	100	2
Total		**17**	**2**	**8**		**420**	**180**	**600**	**23**

EIGHTH SEMESTER

Code	Subject	L	T	P	Exam Duration in hours	Exam Marks	Sess. Marks	Total Marks	Credit points
IITT 81	Digital Image Processing	5	–	–	3	75	25	100	5
IITT 82	Network Security	5	–	–	3	75	25	100	5
IITT 83	C# and .NET framework	5	–	–	3	75	25	100	5
IITE 84	Elective–II	5	–	–	3	75	25	100	5
IITP 85	.NET - Lab	–	–	4	3	60	40	100	2
IITP 86	Mini Project	–	–	4	–	60	40	100	2
Total		**20**	**–**	**8**		**420**	**180**	**600**	**24**

NINETH SEMESTER

IITT 91	Principles of Marketing & Management	4	–	–	3	75	25	100	4
IITT 92	Advanced Java (J2EE)	5	–	–	3	75	25	100	5
IITE 93	Big Data Analytics	5	–	–	3	75	25	100	5
IITE 94	Elective–III	5	–	–	3	75	25	100	5
IITP 95	Advanced Java - Lab	–	–	4	3	60	40	100	2
IITP 96	Open Source Software Lab	–	–	4	3	60	40	100	2
Total		**20**	**–**	**8**		**420**	**180**	**600**	**23**

TENTH SEMESTER

IITT 101	Project and Viva–voce	–	–	–	–	60	40	100	20
Total		–	–	–	–	**60**	**40**	**100**	**20**

Total 225

L- Lecture; T-Tutorial; P-Practical

ELECTIVES

IITE 74: Elective I

- Unix–Networking
- Optical and Satellite Communication
- Fault Tolerant systems
- Human Computer Interface
- Multimedia Systems
- E–commerce
- Software Quality, Control & Assurance

IITE 84: Elective II

- Client–Server Architecture
- Data warehousing and Mining
- Software Project Management
- Mobile Computing
- Software testing
- Enterprise Resource Planning

IITE 94: Elective III

- Cloud Computing
- Distributed Component Architecture
- Wireless Networking
- Neural Network and Fuzzy systems
- Natural Language Processing
- Global Positioning Systems and Remote Sensing

M.Sc. INFORMATION TECHNOLOGY

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SYLLABUS

FIRST YEAR : FIRST SEMESTER

தாள்:-1 - ITAC-11 - செய்யுளும் உரைநடையும்

அலகு:-1 - குறுந்தொகை

பாடல் எண்கள்:- 3, 6, 16, 18, 24, 28, 32, 37, 40, 54, 57, 60, 69, 74, 77, 83, 85, 93, 97, 99
(இருபது பாடல்கள் மட்டும்)

அலகு:-2 - புறநானூறு

பாடல் எண்கள்:- 9, 19, 27, 34, 38, 45, 51, 55, 66, 71, 76, 82, 86, 92, 96
(பதினைந்து பாடல்கள் மட்டும்)

அலகு:-3 - திருக்குறள்

அன்புடைமை, செய்நன்றி அறிதல், அடக்கமுடைமை, புறங்கூறாமை, ஈகை, அருளுடைமை (ஆறு அதிகாரங்கள் மட்டும்)

நாலடியார் கல்வி, கல்லாமை (20 பாடல்கள்)

அலகு:-4 - கம்பராமாயணம்

குகப்படலம் (அயோத்தியா காண்டம்)

அலகு:-5 – உரைநடை

மா.பெரியசாமி தூரன்- சிற்பி. பாலசுப்பிரமணியன்
காப்பியத்திறன் - சோம. இளவரசு

பார்வை நூல்கள்:

1 குறுந்தொகை - உ.வே.சா. பதிப்பு

2. புறநானூறு - உ.வே.சா. பதிப்பு

3. திருக்குறள் - பரிமேலழகர் உரை

4. கம்பராமாயணம் - அண்ணாமலைப் பல்கலைக்கழகப் பதிப்பு

5. குறுந்தொகைச் சொற்பொழிவுகள்

6. குறுந்தொகைத் திறனாய்வு - சோ.ந. கந்தசாமி

7. எட்டுத்தொகைச் செல்வம் - லெ.ப.கரு. இராமநாதன் செட்டியார்

8. மா.பெரியசாமி தூரன் - சிற்பி. பாலசுப்பிரமணியன், சாகித்யஅகாதெமி, முதற்பதிப்பு 2000

9. காப்பியத்திறன் - சோம. இளவரசு- மணிவாசகர் பதிப்பகம், சென்னை

ITAC 11 : HINDI–I (Option)

TEXT BOOK

I. NAVEEN HINDI PATMAALA-I

First 15 lessons only (Poems omitted)
Published by Dakshina Bharatha Hindi Prachar Sabha, T. Nagar, Chennai-17

II SARAL HINDI VYAKARAN

Part-I by S.R. Sastri Pub. By DBHP Sabha, Chennai-17.

IENC 12: ENGLISH THROUGH LITERATURE I: PROSE

Objective:

To develop the communicative competence of learners in the English Language through training them in the skills of listening, speaking, reading and writing.

Unit I

Bonnie Chamberlain	"The Face of Judas Iscariot"
Swami Vivekananda	"Speech at World Parliament of Religion"

Unit II

Stephen Leacock	"My Financial Career"
BhimraoAmbedkar	"Speech on 4th November 1948 in the Constituent Assembly"

Unit III

Robert Lynd	"On Forgetting"
Nirad C. Chaudhuri	"Indian Crowds"

Unit IV

A. G. Gardiner	"All about a Dog"
Ruskin Bond	"My Eccentric Guests"

Unit V

Martin Luther King (Jr.)	"I Have a Dream"
Khushwant Singh	"The Portrait of a Lady"

Text Book:

Ayyappa Raja. S., Shanmugasundari. P., Deivasigamani. T., SaravanaPrabhakar. N., Karthikeyan. B. ***English Through Literature: Prose.***

ICEC 13: CIVICS, ENVIRONMENT AND HEALTH SCIENCES

Unit–I

Introduction: Democracy – Citizenship – Duties of Good Citizen – Society, State and Citizen – Limits of State Activity.

Indian Constitution: Preamble – Basic Features – Citizenship – Fundamental Rights – Fundamental Duties.

Unit–II

Political System: Union Government: President – Prime Minister – Parliament – Supreme Court – Electoral System

State Government: Governor – Chief Minister – Center State Relations.

Local Government: Urban Administrative System – Panchayat Raj System.

Unit–III

Ecosystems: Fundamental concepts and Principles – structure and function classification – modern concept of Ecosystem – Energy flow – ecological indicators.

Unit–IV

Environment: Definition – Natural Resources – classification – conservation – Development of public water supply – Need for protected water supply – per capita consumption – Sanitation – Sewerage system – disposal of sewage – kinds of pollution – their effects on human beings – Impact of Environment on society.

Unit–V

Physical Health – Introduction to health – Food, Meaning of balanced diet, sources, Common Nutritional deficiencies and prevention.

Personal Health – Cleanliness of body, Care of Skin, Nails, Eyes, hair, Oral Health, Clothing, Body posture and good habits such as exercises – Importance of avoiding smoking, alcoholism, drugs etc.,

Population explosion and Family Planning – Importance, Common methods of family planning for Men and Women.

Mothers and Children – Immunization of Children (importance, schedule) care of mothers during Pregnancy and after delivery.

Communicable Diseases – Symptoms and Prevention.

Unit–VI

1. Mental Health – Factors for Maintenance of Good Mental Health.
2. Adolescent Problems.
3. First Aid.

Environment – Ventilation, Lighting, Simple Methods of purification of water, sanitary latrine, prevention of worm infestation (round worm, hook worm)

Text and Reference Books

1. Fadia, B.L. "*Indian Government and Politics"*, Sahitya Bhawan Publication, Agra, 1999.
2. Maheswari, S.R. "*Local Government in India"*, Lakshmi Narain Agarwal, Agra, 1996.
3. Agarwal, R.C. "*Indian Political System"*, New Delhi S.Chand of Company, 2000.
4. James H. Mccrocklin, "*Building Citizenship"*, USA, Allyn and Bacon, INC, 1961.
5. Agarwal & Rana, S.V.S. 1985. "*Environment & Natural Resources*, *Society of Biosciences".*
6. Duggal, K.N. 1994. "*A Text Book on Public Health Engineering",* S.Chand & Co, Ram Nagar, New Delhi.

IMAC 14 : MATHEMATICS–I

Unit–I : Matrices

Rank of a matrix – Computation of the inverse of a matrix by elementary transformation – Characteristic equations – Eigen values and Eigen vectors and their properties–inverse of a matrix using cayley – Hamilton theorem – real quadratic forms – Reduction to canonical form by elementary congruent transformations – Nature of quadratic forms.

Unit–II : Alegbra and Trignometry

Binomial, exponential and logarithmic series (without proof) – Problems on summation of series.

Expansions of Cos n ø and sin n ø in powers of sin ø and cos ø – Expressing $\cos^n ø$ and $\sin^n ø$ in terms of sines and cosines of multiples of ø – hyperbolic functions.

Unit–III : Differential Calculus

Curvature – radius of curvature – centre and circle of curvature – Evolutes – Envelopes – Taylor and Maclaurin series of functions of two variables – Jacobians – Maxima and minima of functions of two variables – constrained maxima and minima – Lagrange's method of multipliers.

Analytical Geometry of three dimensions:

Unit–IV

Direction cosines and direction ratios – Planes –different forms – Equation of plane passing through the line of intersection of two planes – straight lines –Symmetric form – Planes and straight lines – Coplanar lines – Shortest distance between two skew lines.

Unit–V

Spheres – plane section of a sphere – orthogonal spheres – cone – equation of cone having its vertex at the origin or at a given point – right circular cone.

Text Book

1. Venkataraman, M.K. "Engineering Mathematics –Series", National Publishing Company, Chennai.

Reference Books

1. Kreyszig, E. "*Advanced Engineering Mathematics", (8th Edition)*, John Wiley & Sons (Asia) Pvt. Edition, Singapore, 2001.
2. Kandasamy P., Thilagavathy K. and Gunavathy K., "*Engineering Mathematics"*, Series (4th Revised Edition) S. Chand & Co., New Delhi, 2000.

IAPC 15: APPLIED PHYSICS

Unit–I : Laser and Fibre Optics

Construction and working of He – Ne laser – CO_2 laser – Ruby laser – Semiconductor laser – Applications, Types of optical fibres – Single and bundled fibres – Fibre materials – Attenuation – Dispersion – Fibre optic light sources – Detectors – Fibre optic communication – Principles of optical recording.

Unit–II : Electrical Properties and Super Conductivity

Free electron theory of Drude and Lorentz – Weidmann – Franz Law – phenomenon of Super conductivity – Critical temperature and critical field –Meissner effect – Josephson effect – Type I and II super conductors, BCS theory of super conductivity (Qualitative) – High temperature super conductors, Applications: Cryotron, Magnetic levitation–Super conducting magnets.

Unit–III : Semiconducting Materials

Distinction between conductors, semi conductors and insulators on the basis of band theory – Factors affecting resistivity of a conductor, temperature, alloying, pressure, strain, magnetic field and environment –Intrinsic, Extrinsic Semiconductors – Materials preparation: Czochralski method – Zone refining, Hall effect in semiconductor – Applications of Hall effect, IC fabrication (Qualitative)

Unit–IV : Magnetic Properties

Dia, para and Ferromagnetism – Domain theory –Hysteresis – Hard and soft magnetic materials – Curie – Weiss Law – magnetostriction, Ferrites: preparation, properties, applications – Magnetic bubble memory.

Unit–V : Dielectric Properties

Qualitative study of three types of polarisation – effect of temperature and frequency on dielectric constant – Determination of Dielectric constant – Dielectric Loss –Ferro – electric materials – Behaviour of barium Titanate –Piezo Electric materials – Classification of insulators on the basis of temperature.

Text Books

1. Seth and Gupta, "*Course in Electrical Engg. Materials"*, Dhanpai Raj & Sons, 1990.
2. Brijlal and Subramaniam, "*Optics"*, Chand & Co., 1995.
3. Raghavan V. "*Materials Science and Engineering – A First Course"*, PHI, 1991.
4. Arumugam M. "*Materials Science"*, Anuradha Publishers, 1994.
5. Srinivasan M.R. "*Physics for Engineers"*, New Age International (P) Ltd., 1996.

FIRST YEAR: SECOND SEMESTER

தாள்:-2 -ITAC-21 – பயன்பாட்டுத்தமிழும் செம்மொழி வரலாறும்

நோக்கம்

மொழியமைப்பினை விளக்குதல்

மொழிப் பயன்பாட்டில் உருவான - உருவாகும் மாற்றங்களைப் புலப்படுத்துதல்
திசைமொழிகளின் கலப்பினால் தமிழ்மொழியில் ஏற்படும் மாற்றங்களை விளக்குதல்
மொழிக் குடும்பங்கள் குறித்தும் செம்மொழித் தமிழின் சிறப்புகள் குறித்தும்
செம்மொழி ஏற்புக் குறித்தும் விளக்குதல்

அலகு-1

எழுத்துக்களின் எண்ணிக்கையும் வகைகளும், எழுத்துக்களின் மாத்திரை,கால இடைநிலைகள்,மூவகைப் போலிகள் , இருவகைப் பதங்கள், புணர்ச்சிகள்.

அலகு-2

சொற்றொடர் வகைகள் (மூவகை மொழி) தொடரிலக்கணத்தில் காணப்பெறும் வழுவும் வழு அமைதியும் பத்தியமைப்பும் நிறுத்தற் குறியீடுகள் பயன்பாடும். உரைநடை எழுதும் போது மேற்கொள்ள வேண்டிய விதிமுறைகள்.

அலகு -3

மேடைத்தமிழ்

நீங்களும் பேச்சாளர் ஆகலாம்-குமரி அனந்தன் மேடைப்பேச்சுக்குத் தயார் செய்தல்- பேச்சாளருக்குரிய தகுதிகள்- பேசும் முறைகள் - பழக்க வழக்கங்கள்.

அலகு-4

படைப்புத்திறன்

சிறுகதை- கவிதை- கட்டுரை- ஓரங்க நாடகம் - நூல் குறித்த திறனாய்வு
எழுதப் பயிற்சிதரல்.

அலகு-5

பயன்பாட்டுத் தமிழும் செம்மொழி வரலாறும்

மொழி- விளக்கம்- மொழிக்குடும்பங்கள்- உலகச் செம்மொழிகள்- இந்தியச் செம்மொழிகள்- செம்மொழித் தகுதிகள்- வரையறைகள்- வாழும் செம்மொழித் தமிழ்- தமிழின் தொன்மை- தமிழின் சிறப்புக்கள்- தமிழ்ச் செம்மொழி நூல்கள். தமிழ் செம்மொழி அறிந்தேற்பு- பரிதிமாற்கலைஞர் முதல் தற்கால அறிஞர்கள் வரை (அறிஞர்கள்- அமைப்புகள்- நிறுவனங்கள்- இயக்கங்கள் தொடர்முயற்சிகள்- அறப்பேராட்டங்கள்- உலத் தமிழ்ச் செம்மொழி மாநாடு, கோவை-2010)

பார்வை நூல்கள்

1. சோம. இளவரசு, நன்னூல் காண்டிகை உரை, மணிவாசகர் பதிப்பகம், சென்னை.
2. அ.கி பரந்தாமனார், நல்ல தமிழ் எழுத வேண்டுமா? பாரி , நிலையம், சென்னை.
3. பேச்சுக்கலை- கே. வீ. வீரராகவன், வலம்புரி பதிப்பகம், திருநின்றவூர்- 602 024.
4. குமரி அனந்தன், நீங்களும் பேச்சாளர் ஆகலாம், பூம்புகார் பிரசுரம், சென்னை.
5. எழுதுவது எப்படி? மகரம் (தொ. ஆ) பழனியப்பா பிரதர்ஸ், சென்னை.
6. ம. திருமலை- பேச்சுக்கலை- மீனாட்சி புத்தக நிலையம்-2008, மதுரை.

7. சாலினி இளந்திரையன், தமிழ் செம்மொழி ஆவணம், மணிவாசகர் பதிப்பகம், சென்னை, 2005.

8. கால்டுவெல், "திராவிட மொழிகளின் ஒப்பிலக்கணம்"- கழக வெளியீடு, சென்னை.

9. ச. சாரதாம்பாள் - சங்கச் செவ்வியல், மீனாட்சி புத்தக நிலையம், மதுரை,(1993)

10. வா.செ. குழந்தைசாமி - உலகச் செவ்வியல் மொழிகளின் வரிசையில் தமிழ், பாரதி பதிப்பகம், சென்னை.

11 ஜி. ஜான்சாமுவேல் - செம்மொழிகள் வரிசையில் தமிழ், சென்னை 2004.

12. சாலினி இளந்திரையன் - தமிழ்ச்செம்மொழி ஆவணம், மணிவாசகர் பதிப்பகம் சென்னை-2005

13. ச. அகத்தியலிங்கம் -சங்கஇலக்கியம்-செவ்வியல் பார்வை மெய்யப்பன் பதிப்பகம், சிதம்பரம்-2004.

14. மணவை. முஸ்தபா - செம்மொழி உள்ளும் புறமும், அறிவியல் தமிழ் அறக்கட்டளை, சென்னை.

ITAC 21 : HINDI – II (Option)

TEXT BOOK

I NAVEEN HINDI PATMAALA-II
First 10 lessons (including poems) Pub. by DBHP Sabha, Chennai-17

II MANOHAR KAHANIYAM – PART-II
First 10 stories only Pub. by DBHP Sabha, Chennai-17

IENC 22: ENGLISH THROUGH LITERATURE II: POETRY

Objective:

To ensure and enhance:

- the ability of the learner to comprehend and appreciate poems in English
- the competence of the learner in using English language, and
- the interest of the learner in human values and perceptions

Unit I

1. William Shakespeare — "Sonnet 29"
2. William Blake — "A Poison Tree"
3. Robert Bridges — "A Red, Red Rose"

Unit II

4. PB Shelley — "Ozymandias"
5. Alfred Tennyson — "The Brook"
6. HillaireBellock — "Matilda"

Unit III

7. Robert Frost — "Stopping by Woods on a Snowy Evening"
8. Walt Whitman — "O Captain, My Captain"
9. Sylvia Plath — "Mirror"

Unit IV

10. Toru Dutt — "The Lotus"
11. A. K. Ramanujan — "A River"
12. Keki N. Daruwala — "Pestilence in Nineteenth Century Calcutta"

Unit V

13. Gabriel Okara — "Once Upon a Time"
14. Maki Kureshi — "The Kittens"
15. Robert Finch — "Peacock and Nightingale"

Text Book:

Karthik Kumar. S., Gnanaprakasam.V., Arputhavel Raja. G., Shanmugasundaram. C., Vijaya. R.***English Through Literature:Poetry***

IMAC 23 : MATHEMATICS–II

Unit–I

Integral Calculus: Methods of integration (Revision) – Integration by parts – properties of definite integrals – Reduction formulae – Evaluation of double and triple integrals – Change of order of integration – Application of multiple integrals for finding areas and volumes – Beta and Gamma functions.

Unit–II

Differential Equations: Linear differential equations of second order with constant coefficients. Simultaneous linear differential equations – Linear differential equations of second order with variable coefficients – Euler's homogeneous differential equations – Legendre's differential equations.

Unit–III

Complete solution in terms of an integral of the corresponding homogeneous equation by inspection – reduction to normal form by removing the first derivative – change of independent variable – method of variation of parameters.

Unit–IV

Vector differentiation – Scalar and vector point functions – Differentiation of vectors – gradient of a scalar function – simple applications – Divergence and curl of vector functions – solenoidal and irrolational fields – simple applications – Laplacian operator – Expansion formulae of first and second order differential operators.

Unit–V

Vector integration – Line integral – surface integral volume integral – Gauss' divergence theorem – Stoke's theorem – Green's theorem in plane (proofs of the theorems not needed) – Simple applications.

Text Books

1. Venkataraman, M.K. *Engineering Mathematics – Series,* National Publishing Company, Chennai.

Reference Books

1. Kreyszig, E. "*Advanced Engineering Mathematics", (8th Edition)*, John Wiley & Sons (Asia) Pvt. Edition, Singapore, 2001.
2. Kandasamy, P., Thilagavathy, K. and Gunavathy, K. "*Engineering Mathematics"*, Series (4th Revised Edition) S. Chand & Co., New Delhi, 2000.

IITT 24 : ANALOG AND DIGITAL ELECTRONICS

Unit–I

Semiconductor Device and Circuits: (Qualitative treatment only) Fundamental aspects of semiconductors – PN junction diode – Zener diode – Rectifiers – Zener voltage regulators – Filters – Power supply units – Bipolar junctions Transistors – Transistor Amplifier and inverters – Field Effect Transistor.

Number System and Codes: Binary – Octal – Hexadecimal – BCD – excess three – Gray codes – error correcting and detecting codes.

Unit–II

Digital Circuits and Gates: AND, OR, NOT, NAND, and NOR gates – exclusive OR gates. Positive and negative logic systems – digital integrated circuits – characteristics – TTL and MOS logic circuits – comparison.

Digital Algebra and Karnaugh Maps: Boolean relations – laws and theorems – simplifications – Karnaugh maps and simplifications – don't care conditions – NAND – NAND realizations.

Unit–III

Combinational Logic: Design and implementation of Half and Full adders – Subtractors – Parallel adders – carry look ahead addition – subtractors – encoders and decoders – multiplexers and demultiplexers.

Sequential Logic: R–S, J–K, D and T type Flip-Flops – Binary counters Ripple and synchronous types UP/DOWN counters – decade counters – Shift registers – Ring counters.

Unit–IV

A/D and D/A Convertors: Operational amplifier basics – DACs: weighted and binary ladder types – ADCs: counter, ramp, successive approximation types.

Unit–V

Operational Amplifiers: Definition of terms – inverting and non-inverting amplifiers, summing amplifiers, integrators and differentiators.

Text and Reference books

1. Malvino, A.P. "*Digital Computer Electronics"*, 3rd *Edition*, Tata McGraw Hill, 1995.
2. Gothamann, H. "*Digital Electronics: An Introduction to Theory and Practice",* Prentice Hall, 1995.
3. Mottershed, A. "*Electronic Device and Circuits"*, Prentice Hall, 1977.
4. Mathur, A.P. "*Introduction to Microprocessor"*, McGraw Hill Book Company, 1981.
5. Hamachar V.C., Vranesic Z.G. and Zaky S.G., "*Computer Organisation",* McGraw Hill, 1978.

IITT 25: PROGRAMMING IN 'C'

Unit–I

Program Development: Top down Approach – Modularity – Stepwise Refinement – Pseudo code Selection – iteration – control structures – Loops– Structured Programming– Procedures and Recursion – Exchanging the values – Factoring Methods – Array Techniques – Basics of Sorting – Text Processing.

Unit–II

Overview of C data types – Operators and Expressions – History of ANSI Standard – Anatomy of C Program–Coding Style–Sample C Programs – Executing Simple Programs – Character set – Key words and Identifiers – Constants, Variables and data types – symbolic constants – Operators – Expressions – Evaluation of Expressions – Precedence of Operators – Type conversions in Expressions – Associativity and Precedence– Some Computational Problems.

Unit–III

I/O operations, Control flow and arrays: Reading and writing a character – Formatted input and output–Conditional Branching – Switch statement – Looping – Nested Loops–The break and continue statements–The goto statement – Infinite Loops–Declaring Arrays–Storing arrays in memory – Initializing arrays –Strings–Two Dimensional Arrays–Multidimensional arrays.

Unit–IV

Functions, Pointers, Storage classes, structures and unions–Need for user defined functions–The form of c functions–Return values and their types–calling a function – category of functions – Recursion–functions –functions with arrays–The scope and life time of variables in functions–understanding pointers–pointer arithmetic and expressions – Pointer and arrays–array of pointers–pointers to pointers – passing pointers as arguments to functions–different storage classes–extern, static, auto, register–structure – definition–structures within structures – structures and functions–unions–dynamic storage allocation – Linked locations.

Unit–V

File management and preprocessors: streams, buffering, error handling, opening and closing a file, reading and writing data, selecting the I/O method– random access–macro substitution – conditional substitution–conditional compilation – include facility, line control.

Text Books:

1. R.G.Dromey " How to Solve it by Computer ", PHI , 1998
2. E.Balagurusamy " Programming in ANSI C " , Tata McGraw Hill, 2004.
3. Byron G. Gottrifiried, "Programming with C", Schaums Outline Series, McGraw Hill book Company, 1996.

Reference Books:

1. Deitel and Deitel " C How to Program ", Addison Wesley , 2001
2. Brian W.Kernighan & Dennis Ritchie "C Programming Language", PHI, 1990
3. Byron.S.Gottfried "Schaum's Outline of Programming with C ", 2nd Edition,1996

SECOND YEAR : THIRD SEMESTER

தாள்:-3- ITAC 31 - உரைநடையும் நாடகமும்

நோக்கம்: இலக்கியங்களின் சிறப்புகளையும் கருத்துகளையும் உரைநடை வழியாகப் புலப்படுத்தல் - உரைநடைத்திறனை எடுத்துரைத்தல்

அலகு-1

இலக்கிய விளக்கம் - ஆசிரியர் (வ.சுப. மாணிககம்)
இலக்கிய விளக்கம் - இலக்கணக் குறள்கள் - வரிசைப்பாட்டு – வாழ்வாங்கு – தூய இலக்கியம் - நடைமுறை அறங்கள் - இலக்கியக்கலை

அலகு-2

குறளணிகள் - இலக்கிய வெள்ளம் - தன்நெஞ்சம் - இலக்கியத்தளம் - குறள் விளக்கம் - நம்பிக்கை நூல் - நீதி விளக்கம்

அலகு-3

ம.ப.பெரியசாமித்தூரன் - (ஆசிரியர் - சிற்பி பாலசுப்பிரமணியம்)
வாழ்வும் பணியும் - அன்பில் திளைத்த கவிதை – சிறுகதைப் படைப்புகள் நாடகங்களும் கீர்த்தனைகளும் - கட்டுரைச் செல்வம்

அலகு-4

சிறுவர் இலக்கியம் அறிவியல் நூல்களும் பிறவும் - கலைக்களஞ்சியப் பணி – பாரதி தமிழ் - தூரன் என்றொரு மனிதர்.

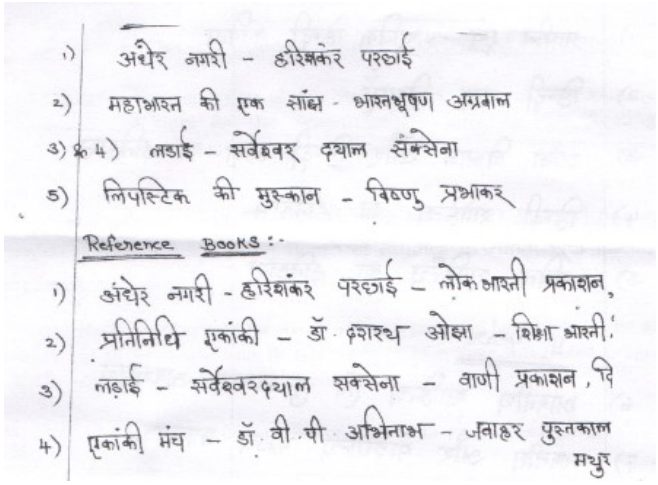
அலகு-5

நாடகம் - தோகை வண்ணம் (ஆசிரியர் - டாக்டர் ச. சவகர்லால்)

பாடநூல்கள்

1. வ.சுப.மாணிக்கம் - இலக்கிய விளக்கம்
   மணிவாசகர் நூலகம், முதற்பதிப்பு-1971
2. சிற்பி பாலசுப்பிரமணியன் &
   மா. ப.பெரியசாமித்தூரன் - சாகித்ய அகாதெமி, முதற்பதிப்பு-2000
3. டாக்டர் ச. சவகர்லால் - தோகை வண்ணம்,
   பழனியம்மாள் வெளியீடு, சென்னை,
   முதற்பதிப்பு-2008
   ஐங்கரன் அடுக்ககம், சையத்காதர் அவென்யூ-
   விருகம்பாக்கம், சென்னை-92.

ITAC 31 : HINDI – III (Option)



1) अंधेर नगरी - हरिशंकर परसाई
2) महाआश्न की एक सांझ - आशनभूषण अग्रवाल
3) & 4) लड़ाई - सर्वेश्वर दयाल सक्सेना
5) लिपस्टिक की मुस्कान - विष्णु प्रभाकर

Reference Books :-

1) अंधेर नगरी - हरिशंकर परसाई - लोकभारती प्रकाशन,
2) प्रतिनिधि एकांकी - डॉ. दशरथ ओझा - शिक्षा भारती,
3) लड़ाई - सर्वेश्वरदयाल सक्सेना - वाणी प्रकाशन, दि
4) एकांकी मंच - डॉ. वी. पी. अभिनाश - जवाहर पुस्तकाल
मथुर

IENC 32: ENGLISH THROUGH LITERATURE III: DRAMA

Objective:

To enhance the conversational competence of the learner by introducing to him to dramas in English

Unit I

Stanley Houghton	"The Dear Departed"
Kenneth Sawyer Goodman	"The Game of Chess"

Unit II

A. A. Milne	"The Princess and the Woodcutter"
Anton Chekhov	"A Marriage Proposal"

Unit III

Arnold Bennett	"The Stepmother"
Arthur Miller	"Grandpa and the Statue"

Unit IV

William Shakespeare	***King Lear***(Act I, Scene i)
William Shakespeare	***Julius Caesar*** (Act III, Scene ii)

Unit V

Frances Goodrich & Albert Hackett	***The Diary of Anne Frank***(Act I)
Betty Keller	"Tea Party"

Text Book:

Florence. S., Aruna Devi. G., Rajamohan. R., Bhuvaneswari. S., Soundararajan. M. ***English Through Literature: Drama.***

IMAC 33 : MATHEMATICS–III

Unit–I

Laplace Transform: Definition – properties of Laplace transform – Linearity property – shifting property – change of scale property – laplace transform of derivatives and integrals – multiplication by t^n – division by t –

Standard transforms – Laplace transform of periodic functions – convolution theorem – Inverse Laplace transforms – solution of Linear differential equations with constant coefficients and simultaneous differential equation using laplace transforms.

Unit–II

Partial Differential Equations: Formation of partial differential equations by eliminating arbitrary constants and arbitrary functions – methods of solving first order partial differential equations – second order homogeneous linear partial differential equations with constant coefficients.

Unit–III

Complex Variables: Function of a complex variable – analytic function – Cauchy reimann equations – harmonic functions – conjugate harmonic functions – construction of an analytic function from its real or imaginary part using Milne Thomsons method – conformal mappings – bilinear transforma tions.

Unit–IV

Complex integration – Cauchy's integral theorem – Cauchy's integral formula – Cauchy's inequality – Taylor's series – Laurentz's series – Cauchy's residue theorem – contour integration – evaluation of simple standard integrals, round unit circle and semicircle.

Unit–V

Fourier series and Fourier Transform : Derichlet's conditions – Euler's formula – Fourier series for even and odd functions – half range sine series and cosine series – change of interval – complex form of Fourier series – Fourier transform – Fourier Sine and cosine transforms.

Text Book

1. M.K. Venkataraman, "*Engineering Mathematics", (Series),* National Publishing Company, Madras, 1986.

References

1. P. Kandasamy, K. Thilagavathy and K. Gunavathy, "*Engineering Mathematics", (Series)*, S.Chand and Co., 1988.
2. S. Narayanan, T.K. Manikavachagam Pillai and G. Ramanaiah, *Advanced Mathematics for Engineering Students (Series),* S.Viswanathan Printers and Publishers Pvt. Ltd., 1986.
3. S.S. Sastry, "*Engineering Mathematics", (Series)*, Prentice Hall of India Pvt. Ltd., 1985.
4. Ervin Kreyszig, "*Advanced Engineering Mathematics"*, Wiley Eastern Pvt. Ltd., 1985.
5. F.B. Hildebrand, "*Advanced Calculus for Applications"*, Prentice Hall of India Pvt. Ltd., 1988.

IITT 34: PRINCIPLES OF COMMUNICATIONS

Unit–I

Introduction: A Communication Model – Data Communications Networking – Computer Communication Architecture – Transmission Impairments – Transmission Media.

Unit–II

Data Encoding – Digital Data Digital Signals – Digital Data Analog Signals – Analog Data Analog Signals – Analog Data Digital Signals.

Unit–III

Data Link Control: Flow Control – Error Detection – Error Control – High Level Data Link Control (HDLC) – Multiplexing – Frequency Division Multiplexing – Time Division Multiplexing.

Unit–IV

Circuit Switching: Switching Concepts – Routing In Circuit Switched Networks – Packet Switching : Principes – Routing In Packet Switching.

Unit–V

Frame Delay: Frame Relay Protocol Architecture – Frame Relay Call Control User Data Transfer – Network Functions.

Asynchronous Transfer Model (ATM): Protocol Architecture – ATM Logical Connection – ATM Cells – ATM Adaption Layer.

Text Books

1. William Stallings, "*Data And Computer Communications"*, Fifth Edition, Prentice Hall of India, 1997.

References

1. Ulysess D. Black, "*Data Communications and Distributed Networks"*, Third Edition, Prentice Hall of India, 1997.
2. Praksh C. Gupta, "*Data Communications"*, Prentice Hall of India, 1996.

IITT 35 : DATA STRUCTURES

Unit–I

Introduction – Primitive data types – Arrays in C – Structures in C. The Stack – Definitions and examples – representing stacks in C – Applications.

Unit–II

Queues and Lists: The Queue and its sequential representation – Priority queues – Applications – Linked Lists – Singly Linked List – Doubly Linked List – Circularly linked list – Applications.

Unit–III

Trees: Binary trees – Binary tree representations – representing lists as binary trees – trees and their applications – Graphs – Representations, Traversals.

Unit–IV

Sorting: Selection – Bubble – Merge – Heap – Quick – Radix sort – Tree sorting.

Unit–V

Searching: Basic search Techniques – Tree searching – General search trees – Hashing.

Text Books

1. Yedidyah Langsam, Moshe J. Augenstein and Aaron M. Tenenbaum, "*Data Structures Using C"*, Prentice Hall, Second Edition, 1996.
2. Jean Paul Trembly and Paul G. Sorenson, "*An Introduction to data structures with applications"*, McGraw Hill, 1984.

References

1. Ellis Horowitz and Sartaj Sahani, "*Fundamentals of Data Structures in Turbo Pascal"*, Computer Science Press, 1989.

SECOND YEAR : FOURTH SEMESTER

தாள்: 4 – ITAC 41- தமிழிலக்கிய வரலாறு

நோக்கம்: தமிழ்இலக்கிய வளர்ச்சி வரலாற்றினை விவரித்து தமிழ் இலக்கியங்கள் குறித்து அறிமுகம் செய்தல்.

அலகு-1 சங்க காலம் , சங்க மருவியகாலம்

தொல்காப்பியம்- சங்ககாலம்- முற்சங்கங்கள் - பாட்டும் தொகையும்- தொகுப்புமுறை- சிறப்புகள்- சங்கப் புலவர்கள்- தொல்காப்பியம்- பதினெண்கீழ்க்கணக்கு நூல்கள், முற்காப்பியங்கள்.

அலகு-2 பல்லவர், சோழர்காலம்

சைவ இலக்கியங்கள்- பன்னிருதிருமுறைகள்- வைணவ இலக்கியங்கள்- நாலாயிர திவ்விய பிரபந்தம் - ஐஞ்சிறுகாப்பியங்கள்- கம்பராமாயணம்- பெரியபுராணம்- பிற இலக்கியங்கள்

அலகு-3 நாயக்கர் காலம்

சிற்றிலக்கியங்கள்- அந்தாதி- தூது-மாலை- கோவை- பரணி- கலம்பகம்- உலா-பிள்ளைத்தமிழ்- கோவை- பள்ளு- குறவஞ்சி- அருணகிரிநாதர்- குமரகுருபரர்- காளமேகப்புலவர் -சிவப்பிரகாசர் - தனிப்பாடல்கள்.

அலகு-4 ஐரோப்பியர் காலம்

உரைநடை வளர்ச்சி- தாயுமானவர் பாடல்கள்- மீனாட்சி சுந்தரம்பிள்ளை- இராமலிங்க அடிகள்- வேதநாயகம் பிள்ளை- கிறித்தவர்களின் தமிழ்ப்பணி- இஸ்லாமியர்களின் தமிழ்த் தொண்டு- நாடகத் தமிழ்- மனோன்மணியம் சுந்தரம்பிள்ளை- பம்மல் சம்பந்தமுதலியார்- சூரியநாராயண சாஸ்திரியார்- பிறர்.

அலகு-5 இக்காலம்

மரபுக்கவிதை – பாரதியார்- பாரதிதாசன்- கவிமணி – நாமக்கல் கவிஞர் வாணிதாசன், முடியரசன்- கண்ணதாசன். உரைநடை- பரிதிமாற்கலைஞர்- உ.வே.சா.- மறைமலை அடிகள்- எஸ். வையாபுரிப்பிள்ளை- ரா.பி. சேதுப்பிள்ளை- திரு.வி.க. – மு.வ .- வ.சுப. மாணிக்கம்- சிறுகதை – புதுமைப் பித்தன்- கு.ப.ரா.- லா.சா.ரா.- கு.அழகிரிசாமி-தி.ஜா- சுந்தரராமசாமி- விந்தன்- மு.வ - நாவல்- மாயூரம் வேதநாயகம்பிள்ளை- மாதவையா – கல்கி- அகிலன் - தி. ஜானகிராமன் - நா. பார்த்தசாரதி- ராஜம்கிருஷ்ணன், புதுக்கவிதை – எழுத்து - ந. பிச்சமூர்த்தி, வல்லிக்கண்ணன், பசுவையா, சி. மணி, ஞானக்கூத்தன் , வானம்பாடி இயக்கம்-நா.காமராசன், சிற்பி,மேத்தா,மீரா - அறிவியல் தமிழ்- இணையத்தமிழ்

பார்வை நூல்கள் :

1. மு.வரதராசன், -தமிழ் இலக்கிய வரலாறு, சாகித்திய அகாதெமி வெளியீடு 1998.

2. பூவண்ணன், -தமிழ் இலக்கிய வரலாறு, கழக வெளியீடு சென்னை.

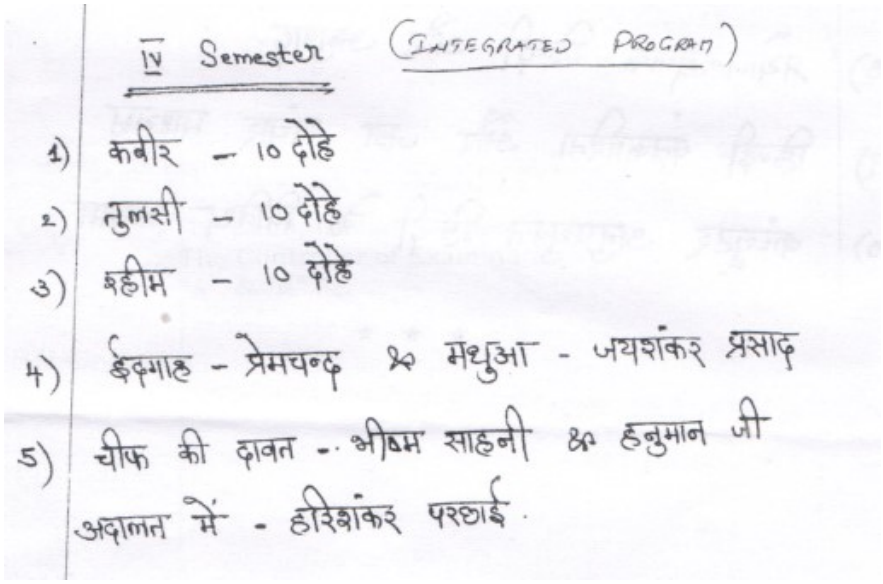
3. தமிழண்ணல், -புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு, மீனாட்சி புத்தக நிலையம், 1998.

4. சி. பாலசுப்பிரமணியன், -தமிழ் இலக்கிய வரலாறு, பாரிநிலையம், சென்னை. 1987

5. எம்.ஆர் அடைக்கலசாமி, -தமிழ் இலக்கிய வரலாறு, கழக வெளியீடு, சென்னை 1994.

6. மது .ச. விமலானந்தம் - தமிழ் இலக்கிய வரலாற்றுக் களஞ்சியம், 1987.

ITAC 41 : HINDI – IV (Option)



IV Semester (INTEGRATED PROGRAM)

1) कबीर – 10 दोहे
2) तुलसी – 10 दोहे
3) रहीम – 10 दोहे
4) ईदगाह - प्रेमचन्द & मधुआ - जयशंकर प्रसाद
5) चीफ की दावत - भीष्म साहनी & हनुमान जी अदालत में - हरिशंकर परसाई.

IENC 42 ENGLISH THROUGH LITERATURE IV: SHORT STORY

Objective:
To develop the communicative competence of learners in the English Language through training them in the skills of listening, speaking, reading and writing

Unit I

1. O' Henry — "After Twenty Years"
2. Ernest Hemingway — "A Day's Wait"

Unit II

1. Flora Annie Steel — "Valiant Vicky"
2. Oscar Wilde — "The Selfish Giant"

Unit III

1. R. K. Narayan — "An Astrologer's Day"
2. ShashiDeshpande — "I Want"

Unit IV

1. Leo Tolstoy — "Where Love is God is"
2. Somerset Maugham — "The Ant and the Grasshopper"

Unit V

1. Chinua Achebe — "Marriage is a Private Affair"
2. Bessie Head — "Heaven is not Closed"

Text Book:

Selvaraj. A., Dinakaran. P., Madhavan. M., Ganeshram. K., Shanthi. SP. ***English Through Literature: Short Story***

IMAC 43 : RESOURCE MANAGEMENT TECHNIQUES

AIM: To understand the underlying concepts of linear programming, Classical optimization theory and project scheduling.

Unit-I

Linear programming (LP) LP formulation and graphical solution - the simplex method - revised simplex method.

Unit-II

Duality and networks - definition of the dual problem - primal - Dual relationships - Dual simplex method - transportation and assignment models - transshipment models - network minimization - shortest route problems .

Unit-III

Integer programming - cutting plane algorithms, Branch and bound Algorithm - Multistage (dynamic) programming solution of LP by dynamic programming.

Unit-IV

Classical optimization theory: unconstrained problem - Jacobian method - Lagrangean method - khun tucker conditions - simple problems.

Unit-V

Project scheduling. network diagram representation - critical path Computation - time charts and resources levelling – PERT Networks

Text Book:

1. Taha A.H.,operations research an introduction , macmillan publishing company, New york,1997.

Reference Books:

1. Billey E. gillet, Introduction To Operations Research A Computer OrientedAlgorithmic Approach,Tata McGraw Hill,New Delhi, 1979.

IITT 44: SOFTWARE ENGINEERING

Unit-I : Introduction

A Generic View of Process – Process Models-The Waterfall Model-Incremental Model-Evolutionary Model-Specialized Model-The Unified Process–Agile Process – Agile Models – Software Cost Estimation – Planning – Risk Analysis – Software Project Scheduling.

Unit-II : Requirement Analysis

System Engineering Hierarchy – System Modeling – Requirements Engineering: Tasks- Initiating The Process-Eliciting Requirements-Developing Use Cases-Negotiating Requirements-Validating Requirements – Building the Analysis Models: Concepts

Unit-III : Software Design

Design Concepts – Design Models – Pattern Based Design – Architectural Design – Component Level Design – Component – Class Based And Conventional Components Design – User Interface – Analysis And Design

Unit-IV : Software Testing

Software Testing – Strategies: Conventional - Object Oriented – Validation Testing –Criteria – Alpha – Beta Testing-System Testing – Recovery – Security – Stress – Performance-Testing Tactics – Testing Fundamentals-Black Box – While Box – Basis
Path-Control Structure

Unit-V : SCM And Quality Assurance

Software Configuration And Management-Features- SCM Process- Software Quality Concepts – Quality Assurance – Software Review–Technical Reviews – Formal Approach To Software Quality Assurance – Reliability – Quality Standards – Software Quality Assurance Plan

Text Book:

1. Roger Pressman.S., "Software Engineering: A Practitioner's Approach", 6th Edition, Mcgraw Hill, 2005.

Reference Books:

1. P. Fleeger, "Software Engineering", Prentice Hall, 1999.
2. Carlo Ghezzi, Mehdi Jazayari, Dino Mandrioli, "Fundamentals of Software Engineering", Prentice Hall Of India 1991.
3. Sommerville, "Software Engineering" , 5th Edition: Addison Wesley, 1996.

IITT 45: DATA BASE MANAGEMENT SYSTEMS

Unit–I

Introduction: Purpose Of Database Systems – Overall System Structure – Entity Relationship Model: Entity & Entity Sets – Relationships – Mapping Constraints – Primary Keys – E-R Diagram.

Unit–II

Relational Model: Structure – Formal Query Languages – Relational Algebra – Relational Calculus – Commercial Query Languages.

Unit–III

Network Data Model: Data Structure Diagrams – DBTG Codasyl Model Retrieval, Update & Set Processing.

Unit–IV

Relational Database Design: Pitfalls – Normalization Using Functional Dependencies – Decomposition – Boyce – Codd Normal Form – Third Normal Form – Normalization Using Multivalued Dependencies – Fourth Normal Form – Normalization Using Join Dependencies – Domain Key Normal Form.

Unit–V

Query Processing: Query Interpretation – Equivalence of Expression – Query Processing Cost – Query Optimizer. Basic Concepts of Database Recovery – Concurrency Control Database Security and Integrity – Distributed Database.

Text Books

1. Abraham Silberschatz, Henry F. Korth, S. Sudharshan, “Database System Concepts”, Sixth Edition, Tata McGraw Hill, 2002.

References

1. Jeffery D. Ullman, “*Principles of Database System”*, Galgotia Publishers, 1998.
2. Ramakrishnan, “*Database Management System”*, McGraw Hill, 1998.
3. Ramez Elmasri, Shamkant B. Navathe, “Fundamentals of Database Systems”, FourthEdition ,Addision Wesley, 2002.
4. Raghu Ramakrishnan, “Database Management Systems”, Third Edition, McGraw Hill, 2002.

IITT 46 : MICROPROCESSOR AND ITS APPLICATIONS

Unit–I

Microcomputer – microprocessor architecture and its operations – memory input/output – addressing modes – instruction classification, format and timings.

Unit–II

Instruction set – Data Transfer instructions: Arithmetic operations – logic and Branch operation – Looping, counting and indexing – 16 bit arithmetic operations related to memory – logic operations – time delays.

Unit–III

Stack – subroutine – call and Return instruction – parallel input/output – 8255 programmable peripheral interface – 8253 Programmable timer – The 8085 Interrupts: 8259 programmable interrupt controller – Direct Memory Access – 8257 DMA controller .

Unit–IV

Advanced microprocessors – 80 x 87 architecture – Concepts of arithmetic coprocessor – introduction to 80386, 80486 – memory paging mechanism.

Unit–V

Introduction to the Pentium and Pentium pro microprocessor – Applications – Temperature monitoring and Control – Traffic light Control.

Text Books

1. Ramesh S. Gaonkar, "Microprocessor Architecture Programming and Applications with 8085", Fourth Edition, Penram International Publishing 2000.
2. Barry B. Brey, "The Intel Microprocessors 8086/8088, 80186/80188, 80286, 80386,80486, Pentium and Pentium Pro Processor Archietecture, Programming and Interfacing", 4th Edition, Prentice Hall of India Private Limited, 1997.

References

1. Badri Ram, "Fundamentals of Microprocessor and Microcomputer", Dhanpat Rai Sons, 1988.
2. Douglas V. Hall, "Digital System and Microprocessors", McGraw Hill.
3. Yu Chang Liu and Glenn A. Gibson, "Microcomputer System – The 8086/8088 Family", Prentice Hall of India, 1991.
4. B. Govindarajalu, "IBM PC and CLONES", Tata McGraw Hill, 1991.
5. Ray A.K. Bhurchandi. K.M, " Advanced Microprocessor and Peripherals", Tata McGraw, Hill, 2002.

THIRD YEAR : FIFTH SEMESTER
IITT 51 : OBJECT ORIENTED PROGRAMMING USING C++

UNIT-I

Introduction to OOP: Overview of C++ - classes - structures - union - friend function - friend class - inline function - constructors - static members - scope resolution operator - passing objects to functions - function returning objects.

UNIT-II

Arrays - pointers - this pointer - references - dynamic memory allocation - functions overloading - default arguments - overloading constructors - pointers to functions.

UNIT-III

Operator overloading - member operator function - friend operator function - type conversion - inheritance - types of inheritance - virtual base class - polymorphism - virtual function.

UNIT-IV

Class templates and generic classes - function templates and generic functions -overloading a function templates - power of templates - exception handling - derived class exception - exception handling functions.

UNIT-V

Streams - formatted I/O with its class functions and manipulators - creating own manipulators - file I/O - conversion functions - standard template library.

Text Book

1. Balagurusamy E, “Object Oriented Programming with C++”, 3/E, TMG, 2006.

Reference

1. Hubbard,”Programming with C++”, 2/e, Schaum Outline Series, TMH, 2006.

2. Bjarne Stroustrup, "The C++ Programming Language", Addison Wesley Publications, Second Edition, 1991.

3. Sarang Proonachandra,”Object Oriented Programming with C++”, PHI, 2006.

4. Jagadev A K, Rath A M, and Dehuri S,”Object Oriented Programming Using C++”, PHI, 2007.

IITT 52 : OPERATING SYSTEM

Unit-I:

Introduction – Operating System Operations – Protection and Security – Distributed Systems – Special Purpose Systems – Computing environments – Operating System Services – User operating system Interface – System calls – Types of system calls – System programs – Operating System design and Implementation – Operating System Structure – Virtual Machines – Operating System Generation – System Boot.

Unit-II:

Process Management – Process Concepts – Process Scheduling – Operation on Processes – Interprocess Communication – Examples of IPC Systems – Communication in Client/Server Systems – Threads – Multithreading Models – Threading Issues – CPU Scheduling – Scheduling Criteria – Scheduling Algorithms – Multiple-Processor Scheduling – Thread Scheduling – Process Synchronization – The Critical Section Problem – Peterson's Solution – Synchronization Hardware – Semaphores – Classic Problems of Synchronization – Deadlocks – System Model – Deadlock Characterization – Methods for handling Deadlocks – Deadlock Prevention – Deadlock Avoidance – Deadlock Detection – Recovery from Deadlock.

Unit-III:

Memory Management – Background – Swapping – Contiguous Memory Allocation – Paging – Structure of the Page Table – Segmentation – Virtual Memory Background - Demand Paging – Copy-on-Write – Page Replacement – Allocation of Frames – Thrashing – Memory- Mapped Files – Allocating Kernal Memory – Other Considerations – Operating System Examples.

Unit-IV:

Storage Management – File Concept – Access Methods – Directory Structure – File System Mounting – File Sharing – Protection – File System Structure – File System Implementation – Directory Implementation – Allocation Methods – Free Space Management – Efficiency and Performance – Overview of Mass Storage Structure – Disk Structure – Disk Attachment – Disk Scheduling – Disk Management – Swap Space Management- RAID Structure – Stable Storage Implementation – Tertiary Storage Structure – I/O Hardware – Application of I/O Interface – Kernal I/O Subsystem.

Unit-V:

Comparative study - DOS, UNIX/LINUX, Windows 9x, Windows NT.

Text Book:

2. Abraham Silberschatz, Peter Baer Galvin, Greg Gagne, "Operating Systems Concepts", John Wiley & Sons, Inc., Seventh Edition.

Reference Books:

1. D.M. Dhamdhere, "Operating Systems,A Concept Based Approach", Tata McGraw Hill, 2nd edition, 2006.
2. William Stallings, "Operating systems – Internals and Design principles", Prentice Hall, Third edition 1998.
3. Andrew S. Tenenbaum, "Modern operating systems", PHI, 2nd Edition 2001.
4. Achut S. Godbole and Kahata Atul, "Operating Systems and Systems programming", Tata McGraw Hill 2003.
5. Charles Crowley, "Operating systems – A Design oriented approach", Tata McGraw Hill, 1999.
6. H. M. Deitel, "Operating Systems", Pearson Education, Second Edition,2001

IITT 53: SYSTEM SOFTWARE

UNIT-I
Introduction -Assemblers -grammar and parser's -lexical analysis -Symbol Tables –hashing.

UNIT-II
Forward References -chaining -Extending the Example expressions -compilers - Conditional Assembly -Macros -More Macros.

UNIT-III
Linkers and Loaders -Linkers -Libraries -Command Languages –Scripts.

UNIT-IV
Sequential Devices -Device Independence -Direct Memory Access -I/O Queues –Interrupts-Critical Sections.

UNIT-V
File Systems -File Access -Directory Management -Schedulers -Concurrent Programming -Security and Protection.

Text and Reference books

1. Dhamdhere, "System Programming and Operating Systems", Second Edition, TMH.
3. Leland L. Beck, "System Software", Addison Wesley, 1997.
4. Silbarshatz, Peterson & Galvin, "Operating System Concepts", Addison Wesley,
5. Charles Crowley, "Operating Systems", Tata McGraw Hill, 1999.
6. Harvey M. Deital, "An introduction to Operating Systems", Addison Wesley, 1999.

IITT 54: VISUAL PROGRAMMING

Unit–I : Historical Development of Programming

Procedural Programming – Structured Programming – Object Oriented Programming – Windows Programming – Event Oriented Programming – User Interfaces – GUI – Conceptual comparison of different types of Programming.

Unit–II : Windows Programming

Overview of Windows Programming – Data types – Structure of a windows program – Creating windows – Windows support functions – Windows messages – Message Processing Functions – Device contexts – resources – Menus – Dialogs – Document Interfaces – Dynamic Linking libraries.

Unit–III : VISUAL BASIC Programming

Introduction – Forms – Variables– Types – statements – properties and methods – events – modules – Procedures and functions – Tool box controls – menus – grid controls – Dialog boxes – Data base Manager – Data control – Data Access objects.

Unit–IV : VISUAL C++ Programming

Objects – Classes – MFC Library application framework – App wizard – class wizard – resources – Event handling – menus – dialog boxes – Importing VBX Controls – MFC File handling – Document view architecture – serialization – splitter windows.

Unit–V : Advance Concepts

Communicating with other applications – OLE concepts – MDI applications – calling procedures in DLL – debugging – Data base management with ODBC – Data base Application.

Text Books

1. Charles Petzold, "*Windows Programming"*, Microsoft Press, 1992.
2. Garry Cornell, "*Visual Basic 6 from the Ground Up"*, TMH, 1999.
3. Steven Holzner, "*Visual C++ Programming"*, *Second Edition*, PHI Publishers, 1997.

References

1. David Kruglinski, J. "*Inside Visual C++"*, Microsoft Press, 1993.
2. Mueller, "*VC++ 5 from the Ground up*", TMH, 1997.

THIRD YEAR : SIXTH SEMESTER
IITT 61: PROGRAMMING IN JAVA

UNIT I: INTRODUCTION

Java Features – comparison of Java with C and C++ - Java and Internet – Java Environment – Java Program structure – Java Tokens – Implementing a Java Program – Java Virtual Machine – Constants – Variables – Data Types – Scope of Variables – Type casting – Operators and expressions – Decision Making, Branching and Looping.

UNIT II: CLASSES AND ARRAYS

Defining a class – Constructors – Methods – overloading – static Members – Nesting of Methods – Overriding methods – Final Classes – Abstract Class – Visibility control – Arrays – creating an array – Two Dimensional arrays – Strings – String Arrays – String Methods – String Buffer Class – Vectors – Wrapper Classes.

UNIT III: INHERITANCE, INTERFACES AND PACKAGES

Defining a subclass – Subclass constructor – Multilevel inheritance – Hierarchical Inheritance – Defining Interfaces – Extending Interfaces – Implementing Interfaces – Java APF Packages – creating a package – Accessing and Using a package – Adding a class to a package – Hiding Classes.

UNIT IV: MULTITHREADING, EXCEPTION HANDLING, FILES AND CREATING THREADS

Extending the Thread class – Thread Life cycle – Thread Exception – Thread priority – Synchronization – Runnable Interface – Exceptions – Throwing own Exceptions – Concepts of streams – stream classes – Byte Stream Classes – Character stream Classes – Using Streams – Using file Class –Other Stream Classes.

UNIT V: APPLET AND SWING

Difference between Application and Applets – Applet Life cycle – creating an Executable Applet – Designing a Web Page – Adding Applet to HTML File – Passing Parameters to Applets.

Creating a swing Applet and Application- Programming using Panes- Pluggable Look and feel- Labels- Text fields- Buttons- Toggle Buttons- Checkboxes- Radio Buttons- View Ports- Scroll Panes- Scroll Bars- List- Combo Box- Progress bars- Menus and Toolbars- Layered Panes- Tabbed Panes- Split Panes- Layouts- Windows- Dialog Boxes- Inner frame.

TEXT BOOK

1. E. Balagurusamy, “Programming with Java – A primer”, Second Edition, Tata McGraw Hill Publishing Company, Delhi, 2002.

REFERENCE

1. Herbert Schildt, “The complete Reference – Java 2”, Fifth Edition, Tata McGraw Hill Publishing Company, Delhi, 2002.

IITT 62 : COMPUTER GRAPHICS

Unit–I : Introduction And Hardware

Representative User Of Computer Graphics – Vector Display And Raster Display Architectures – Display Processor – Interactive Input Devices – Output Primitives – Software Portability And Graphics Standards – Conceptual Frame Work For Interactive Graphics.

Unit–II : 2D Graphics

Basic Raster Graphic Algorithms For 2D Primitives – Scan Converting Lines – Circles – Ellipes – Filling Rectangle – Character Generation – 2D Transformations – 2D Clipping – Windowing Transformation.

Unit–III : 3D Graphics

3D Representation Methods – 3D Transformations – Viewing And Projections – Parallel And Perspective Projections – Hidden Line Elimination – Hidden Surface Elimination.

Unit–IV : Graphics Modelling

Curves, Surface And Solid Modeling – Color Model – Ray Tracing Methods – Graphic File Formats.

Unit–V : User Interface Design

Interactive Handling Models – Input And Output Handling In Window Systems.

Text Book

1. Floey, J.D., Van Dam, A, Feiner, S.K. and Hughes, J.F, Computer Graphics, Pearson Education, New Delhi, 2001.
2. Hearn D and Baker M.P, "Computer Graphics – C Version", 2nd Edition, Pearson Education, 2004.

References

1. William M. Newman and Robert Sproull, "*Principles of Interactive Computer Graphics"*, *II Edition*, McGraw Hill, 1989.
2. Steven Harrington, "*Computer Graphics – A Programming Approach"*, McGraw Hill, 1987.

IITT 63: DESIGN AND ANALYSIS OF ALGORITHMS

Unit - I

Introduction – Performance Analysis. Divide and conquer Method: Binary Search, Finding Maximum and Minimum, Merge Sort and Quick Sort.

Unit - II

Greedy Methods: Knapsack Problem, Minimum Cost Spanning Trees, Optimal Storage on Tapes and Single Source Shortest Path Problem.

Unit - III

Dynamic Programming: Multistage Graphs, 0/1 knapsack and Traveling Salesman Problem. Basic Traversal and Search Techniques: Techniques for Binary Tree, Techniques for Graphs: Depth First Search and Breadth First Search - Connected Components and Spanning Tree - Biconnected Components and DFS.

Unit - IV

Backtracking: 8 Queens Problems, Sum of Subsets, Graph Colouring, Hamiltonian Cycle and Knapsack Problem.

Unit - V

Branch and Bound: Least Cost Search. Bounding: FIFO Branch and Bound and LC Branch and Bound. 0/1 Knapsack Problem, Travelling Salesman Problem.

Text Books and References

1. E.Horowitz, S.Sahni and Sanguthevar Rajasekaran, Fundamentals of Computer Algorithms , Second edition, Universities Press.
2. S. K. Basu, Design Methods and Analysis of Algorithms , PHI, 2005.
3. Goodman and S. T. Hedetniem, Introduction to the Design and Analysis of Algorithms , MGH, 1977
4. A.V. Aho, J.D. Ullman and J.E.Hospcraft, The Design and Analysis of Computer Algorithms , Pearson Education.

IITT 64 : COMPUTER NETWORKS

Unit–I : Introduction

Uses and advantages of Networks – Structure, Topology & Design.

Layered Protocols and OSI Model: Need for Layered Protocol – Design of Layers – Communication between layers – Standards organisations – ISO/OSI Layers.

Unit–II: Communications between and among Computers and Terminals

Control & Accountability – Networks – Classification – Simplex, stop & Wait, Sliding window protocols – Protocol performance, specification and verification – Polling selection system – Multi-plexing carrier sense system.

Binary synchronous control (BSC) – High level data link control (HDLC) – Synchronous data link control (SDLC).

Unit–III : Local area Networks

Characteristics of LAN – LAN standards (IEEE 802, ISDN), LAN Topologies and protocol switching – Routing, congestion.

Unit–IV : Personal Computer Networks

PC Communication Characteristics – Error handling – PC as server – Linking PC with mainframes – File Transfer – PC and LAN.

Unit–V : Upper Level Protocols

Network security – Encryption with Private, public keys – Data Encryption standard –ISO security recommendations – Telematics – Electronic mail – protocols for file management.

Text Book

1. Ulyess Black, "*Computer Networks"*, PHI. 1987..

References

1. Andrew S. Tanenbaum- " Computer networks " PHI- 4th edition, 2002.
2. Ulyess Black, "*Data Communications & Distributed Networks"*, PHI, 1987.
3. Ahuja, "*Design and Analysis of Computer Communication Networks"*, McGraw Hill, 1985.
4. Forouzan, "*Intr:to Data Communication and Networking"*, McGraw Hill, 1998.

FOURTH YEAR: SEVENTH SEMESTER

IITT 71 : OBJECT ORIENTED ANALYSIS AND DESIGN

Unit – I:

Complexity: Introduction-Object Basics-OOA-OOD-OO Modelling - Object Oriented Systems development life cycle-The Inherent Complexity of Software-The Structure of Complex Systems-On Designing Complex Systems.

Unit – II:

Classes and Objects: The Nature of an Object-Relationships among Objects-The Nature of a Class-Relationships among Classes-The Interplay of classes and objects-On building quality classes and objects.

Unit – III:

Classification: The Importance of Proper Classification-Identifying Classes and Objects- Key Abstractions and Mechanisms.

The Notation: Elements of the Notation-Class Diagrams-State Transition Diagrams- Object Diagrams-Interaction Diagrams-Module Diagrams-Process Diagrams-Activity Diagram-Component Diagram-Deployment Diagram-Use Case Diagram-Appling the Notation.

Unit – IV:

The Process: First Principle-The Micro Development Process-The Macro Development Process.

Pragmatics: Management and Planning-Staffing-Release Management-Reuse-Quality Assurance and Metrics-Documentation-Tools-Special Topics-The Benefits and Risks of Object Oriented Development.

Unit – V:

Analysis- Design- Evolution and Maintenance of:

1)Data Acquisition:Weather Monitoring Station.
2)Frameworks:Foundation Class library and
3)Client/Server Computing:Inventory Tracking.

Text Book:

1. Grady Booch,"Object Oriented Analysis and Design with Applications", The Benjamin Cummings Publishing Company Inc.,Second Edition,1994.

Reference Books:

1. Taylor.D.,"Object Oriented Information Systems",John Wiley and Sons,1992.
2. Pinson.L. and Wiener R.,"Application of Object Oriented Programming", Addison Wesley Publishing Company,1990.
3. Ali Bahrami, "Object Oriented Systems Development",Irwin Mcgraw Hill, International Edition,1999.

IITT 72: WEB TECHNOLOGY

Unit – I: Web Environment

Internetworking concepts – Devices – Repeaters – Bridges – Routers – Gatways – Internet topology Internal Architecture of an ISP – IP Address – Basics of TCP – Features of TECP – UDP – DNS – Email – FTP – HTTP – TELNET - Web Server and its deployment- N-Tier Arch.- Services of Web Server – Mail server- News server- Proxy server- Multimedia server-

Unit – II: HTML and XML

Formatting- tags- links- list- tables- frames- forms- comments in HTML.
XML: Introduction- displaying an XML Document- Data interchange with an XML Document- Document type definition- Parsers using XML- Client-side usage- Server- side Usage.

Unit – III: Java Script

Introduction- Documents- forms- Statements- Functions- Objects in Java scripts- events and event handling- arrays- FORMS- Buttons- Checkboxes- Text fields and text areas.

Unit – IV: JSP

JSP: JSP overview- JSP language basics- JSP translation and compilation directives- Standard java objects from JSP- JSP configuration and deployment- actions and tags of JSP; Java servlets – Arch- servlet interface- applications of servlets.

Unit – V: VB Script

VBScript in the body of the HTML – Variables - Assignments and expression Procedures and functions-Decisional (conditional/alternative) statements List of VBScript intrinsic functions

Text Books:

1. Phil Hanna, "Instant Java Servlets", Tata McGraw Hill 2000
2. William B.Brogden Bill Brogden- Chris Minnick,"Java Developer's Guide to E- Commerce with XML and JSP", Sybex book, 2001
3. Stephen Walther and others, "Active Server Pages Unleashed", Wrox press Ltd ,1998.

Reference Books:

1. John Wiley , "COM+ & XML: ASP.Net on the Edge" 2001
2. Burdman- "Collaborative Web Development"- Addison Wesley,.1999
3. Sharma & Sharma- "Developing E-Commerce Sites"- Addison Wesley,. 2000
4. Ivan Bayross- "Web Technologies Part II"- BPB Publications. McGraw Hill 2004
5. Shishir Gundavarma- "CGI Programming on the World Wide Web"- O'Reilly & Associate,. 1996
6. DON Box- "Essential COM"- Addison Wesley,1998.
7. Greg Buczek- "ASP Developer's Guide", Tata McGraw-Hill, 2000

IITT 73 SOFT SKILLS DEVELOPMENT

Unit - I - Soft skills and developing positive Attitude - Soft skills: introduction – what are soft skills? - selling your soft skills - attribute regarded as soft skills – soft skills – social- soft skills-thinking – soft skills –Negotiating –exhibiting your soft skills- indentifying your soft skills-improving your soft skills - soft skills training –train yourself-top 60 soft skills - Developing positive attitude: introduction – meaning - features of attitudes- attitude and behavior formation of attitudes–change of attitudes – what can you do to change attitude?-ways of changing attitude in a person – attitude in a workplace – the power of positive attitude-developing positive attitude-example of positive attitude- example of negative attitude-over coming negative attitude- negative attitude and its result.

Unit - II - Art of speaking and writing - Art of speaking: Introduction-what make communication important? - Defining communication-special features of communication – communication process-channel of communication-importance of communication - tips for effective communication - tips for powerful presentation-art of public speaking - importance of public speaking - Art of writing: Introduction – importance of writing –creative writing - writing tips- drawbacks of writing communication.

Unit - III - Body language - Introduction – body talk – voluntary and involuntary body language-forms of body language-parts of body language - origin of body language - uses of body language - body language in building interpersonal relations – body language in building industrial relations-reason to study body language-improving your body language – types of body language-Gender differences-female interest and body language - shaking hands with women - interpreting body language-developing confidence with correct body language.

Unit - IV - Group discussion - Introduction – meaning of GD – why group discussion? - characters tested in a GD – tips on GD – types of GD - skills required in a GD - consequences of GD - behavior of a GD - essential elements of GD - different characters in GD - traits tested in a GD - GD etiquette - areas to be concentrated while preparing for a GD - imitating a GD - techniques to initiate a GD - Non-verbal communication in GD – movement and gestures to be avoided in a GD-topics for GD - **Interview skills -** Introduction – why an interview?.- types of interview - interview panel-types of questions asked-reason for selecting a candidate –reason for rejecting a candidate – on the day of interview– on the interview table – attending job fair-common mistakes that you would't want to do-questions the candidate should not ask during the interview –post- interview etiquette-how does one follow up?- telephonic interview –dress code at interview – typical questions asked – interview mistakes –quick tips- how to present well in interview –tips to make a good impression in an interview – job interview-basic tips-how to search for job effectively – interview quotations.

Unit - V - Time management - Introduction- the 80:20 rule- take a good look at the people around you- examine your work-sense of time management – time is money – features of time- three secretes of time management - time management matrix- analysis of time matrix-effective scheduling – grouping of activities – five steps to successful time management –difficulties in time management-evils of not planning - time management is a myth – overcoming procrastination – ways of find free time- time management tips for students – interesting facts about time- ideal way of spending a day-time wasters – time savers – realizing the value of time-time circle planner.

Text Book:

1. K. Alex "Soft Skills: Know yourself and know the world" S.Chand & company Pvt. Ltd, Third revised Edition, 2014.

FOURTH YEAR: EIGTH SEMESTER
IITT 81 DIGITAL IMAGE PROCESSING

AIM: To introduce the basic concept of image processing .To explore the time and frequency Aspects of image processing

Unit-I

Digital Image Processing Systems: Introduction- Structure of human eye- Image formation in the human eye- Brightness adaptation and discrimination- Image sensing and acquisition- Storage- Processing- Communication- Display. Image sampling and quantization- Basic relationships between pixels

Unit-II

Image Enhancement in the Spatial Domain: Gray level transformations- Histogram processing- Arithmetic and logic operations- Spatial filtering: Introduction- Smoothing and sharpening filters .**Image Enhancement in the Frequency Domain:** Frequency domain filters: Smoothing and Sharpening filters- Homomorphic filtering

Unit-III

Wavelets and Multiresolution Processing: Image pyramids- Subband coding- Haar transform- Series expansion- Scaling functions- Wavelet functions- Discrete wavelet transforms in one dimensions- Fast wavelet transform- Wavelet transforms in two dimensions

Unit-IV

Image Data Compression: Fundamentals- Redundancies: Coding- Interpixel- Psycho-visual- Fidelity criteria- Image compression models- Error free compression- Lossy compression- Image compression standards: Binary image and Continuous tone still image compression standards- Video compression standards.

Unit-V

Morphological Image Processing: Introduction-Dilation- Erosion- Opening- Closing- Hit-or-Miss transformation- Morphological algorithm operations on binary images- Morphological algorithm operations on gray-scale images.

Image Segmentation: Detection of discontinuities- Edge linking and Boundary detection- Thresholding- Region based segmentation

Image Representation and Description: Representation schemes- Boundary descriptors- Regional descriptors

Text Books:

1. R.C.Gonzalez R.E.Woods**, "**Digital Image Processing", Second Edition, Pearson Education 2002
2. Anil K.Jain, "Fundamentals of Image Processing", PHI New Delhi 2001

Reference Book:

1 .William Pratt, "Digital Image Processing", John Wiley

IITT 82: NETWORK SECURITY

AIM : To study the various issues concerning Network security, Database security and Program security

Unit-I

Symmetric Ciphers: Classical Encryption Techniques - Block Ciphers and the Data Encryption Standard – Finite Fields – Advanced Encryption Standard – Symmetric Ciphers – Confidentiality using Symmetric Encryption.

Unit-II

Public Key Encryption and Hash Functions: Introduction to Number Theory – Public Key Cryptography and RSA - Key Management- other Public Key Cryptosystem – Message Authentication and Hash Functions – Hash and MAC Algorithms – Digital Signatures and Authentication Protocols.

Unit-III

Program Security: Secure Programs – NonMalicious Program Errors – Viruses and Others Malicious Code – Targeted Malicious Code – Control Against Threats.

Unit-IV

Database Security: Introduction to Database – Security Requirement – Reliability and Integrity – Sensitive Data – Inference – Multilevel Databases - Multilevel Security

Unit-V

Network Security: networks Concepts – Threats in Networks – Network Security Controls – Firewalls – l. Electronic Mail Security – IP Security – Web Security.

Text Books:

1. Charles B. Pfleeger - Shari Lawrence Pfleeger , " Security in Computing ", Third Edition, Pearson Education, 2003.
2. William Stallings, "Cryptography and Network Security – Principles and Practices ", Pearson Education, Fourth Edition,2003.

IITT 83: C# and .NET FRAMEWORK

AIM: To study about the .NET Framework, C# Basics, Libraries and advanced features of C#.

Unit-I

The .NET framework: Introduction- Common Language Runtime-Common type system-Common language specification- The base class library - the .NET class Library intermediate language-Just-in-time compilation - garbage collection- application installation & assemblies- web services- unified classes.

Unit-II

C# Basics: Introduction- Data types- Identifiers- Variable & constants- C# statements- Object Oriented Concepts- Object and classes- Arrays and Strings- System collections- Delegates and Events- Indexes Attributes- Versioning.

Unit-III

C# Using Libraries: Namespace-System-Input Output-Multi-Threading- Networking and Sockets- Data Handling-Windows forms-C# in web application- Error Handling.

Unit-IV

Advanced Features Using C#: Web Services-Windows services-messaging- Reflection- COM and C#- Localization.

Unit-V

Distributed application in C#- XML and C#- Unsafe Mode- Graphical Device Interface with C#- Case Study (Messenger Application).

Text Books:

1. Shibi Panikkar and Kumar Sanjeev, "Magic of C# with NET Frame Work", Firewall Media,. 2005.
2. Hebert Schildt, "C# 2.0: The Complete Reference", TataMc-Graw Hill, 2006.

Reference Books:

1. Jeffrey Richter, "Applied Microsoft Net Framework Programming", Microsoft Press, 2002.
2. Fergal Grimes, "Microsoft Net for Programmers",.Manning Publication, 2002
3. Tony Baer, Jan D. Narkiewicz, Kent Tegels, Chandu Thota, Neil Whitlow, "Understanding the Net Framework",Wrox Press, 2002
4. Balagurusamy, "Programming with C#"- TataMc-Graw Hill.,2002

FIFTH YEAR: NINTH SEMESTER

IITT 91 : PRINCIPLES OF MARKETING AND MANAGEMENT

Unit–I : Forms of Business Organizations

Sole proprietorship, Company – Public and private sector enterprises – Principles of management – Evolution of management – Function of a manager.

Unit–II : Functions of Management

Planning – Nature and purpose – Types of plans – Objectives, policies, procedures, rules, strategies, programmes, projects.

Unit–III : Staffing

Selection – Recruitment process – Decision making process – Types of decisions – Directing – Leadership – Motivation – Communication – Controlling – process, techniques–Budgetary and Non–budgetary.

Unit–IV : Financial Management

Short term and long term sources of funds – Financing decision – Investment decision – Introduction to financial statements – Production management – Planning and scheduling purchasing, inventory control.

Unit–V : Marketing Management

Introduction to marketing mix–product, pricing, promotion and place – Personnel management – Performance appraisal, conflict – Identification and resolution – Training and development – Introduction to Total Quality Managment, quality circles.

Text Book

5. Koontz, "*Global Prespective in Management"*, McGraw Hill, 1995.

References

6. Nauhria, R.N and Rajnish Prakash, "*Management and Systems*", New Delhi Wheeler Publishing, 1995.
7. Saxena, "*Marketing Management"*, Tata McGraw Hill, 1998.
8. Tripathi, "*Principles of Management"*, Tata McGraw Hill, 1992.

IITT 92 : ADVANCED JAVA (J2EE)

Unit –I:

Networking Programming: Networking Basics - Client-Server Architecture- Socket Overview-Networking Classes and Interfaces-Network Protocols-Developing Networking Applications in Java.
JDBC: Introduction to JDBC-JDBC Drivers & Architecture- Joining, Manipulating Databases with JDBC, Prepared Statements, Transaction Processing

Unit-II:

Servlet: Web Application Basics-Introduction to servlet-Servlet life cycle-Developing and Deploying Servlets-Exploring Deployment Descriptor (web.xml)-Handling Request and Response-Initializing a Servlet-Accessing Database-Servlet Chaining-Session Tracking & Management-Dealing with cookies-Accessing Web Context-Passing INIT and CONTEXT Parameter-Sharing information using scope object-User Authentication-Filtering Request and Response

Unit-III:

Java Server Pages (JSP)

Basic JSP Architecture-Life Cycle of JSP -JSP Tags and Expressions-Role of JSP in MVC-2-JSP with Database-JSP Implicit Objects-Tag Libraries-Using Custom Tag-JSP Capabilities-Exception Handling-Session Management-Directives-JSP with Java Bean-Database handling in JSP.

Unit-IV:

RMI: RMI overview-RMI architecture-Example demonstrating RMI- Defining the Remote Interface, Implementing the Remote Interface, Compiling and Executing the Server and the Client

Unit –V:

EJB: Enterprise Bean overview-Types of enterprise beans-Advantages of enterprise beans-The Life Cycles of Enterprise Beans-Working with Session Beans-Statefull vs. Stateless-Session Beans-Working with Entity Beans-Message Driven Beans-JNDI (Java Naming and Directory Interface)-JNDI overview & JNDI API

Text and Reference Books:

1. “Advanced Java 2 Platform HOW TO PROGRAM” by H. M.Deitel, P. J. Deitel, S. E. Santry – Prentice Hall

2. “Beginning Java™ EE 6 Platform with Glass Fish 3 From Novice to Professional” by Antonio Goncalves

IITT 93: BIG DATA ANALYTICS

AIM : To understand the concepts of Big Data Analytics

Unit-I

Introduction to Big Data: Introduction to Big Data Platform – Traits of Big data -Challenges of Conventional Systems - Web Data – Evolution Of Analytic Scalability - Analytic Processes and Tools - Analysis vs Reporting - Modern Data Analytic Tools - Statistical Concepts: Sampling Distributions - Re-Sampling - Statistical Inference - Prediction Error.

Unit-II

Data Analysis: Regression Modeling - Multivariate Analysis - Bayesian Modeling - Inference and Bayesian Networks - Support Vector and Kernel Methods - Analysis of Time Series: Linear Systems Analysis - Nonlinear Dynamics - Rule Induction - Neural Networks: Learning And Generalization - Competitive Learning - Principal Component Analysis and Neural Networks - Fuzzy Logic: Extracting Fuzzy Models from Data - Fuzzy Decision Trees - Stochastic Search Methods.

Unit-III

Mining Data Streams: Introduction To Streams Concepts – Stream Data Model and Architecture - Stream Computing - Sampling Data in a Stream – Filtering Streams – Counting Distinct Elements in a Stream – Estimating Moments – Counting Oneness in a Window – Decaying Window - Real time Analytics Platform(RTAP) Applications - Case Studies - Real Time Sentiment Analysis, Stock Market Predictions.

Unit-IV

Frequent Itemsets and Clustering: Mining Frequent Itemsets - Market Based Model – Apriori Algorithm – Handling Large Data Sets in Main Memory – Limited Pass Algorithm – Counting Frequent Itemsets in a Stream – Clustering Techniques – Hierarchical – K-Means – Clustering High Dimensional Data – CLIQUE And PROCLUS – Frequent Pattern based Clustering Methods – Clustering in Non-Euclidean Space – Clustering for Streams and Parallelism.

Unit-V

Hadoop and R for Visualization: Backgroundd and fundamentals-moving data in and out of Hadoop-data serialization-applying MapReduce patterns to big data- streaming big data-integrating R and Hadoop for statistics and more-predictive analytics with Mahout- Hacking with Hive-Programming pipelines with pig – HBase-MySQL-NoSQL- RHadoop

Text Books:

1. Michael Berthold, David J. Hand, “Intelligent Data Analysis”, Springer, 2007.
2. Anand Rajaraman and Jeffrey David Ullman, “Mining of Massive Datasets”, Cambridge University Press, 2012.

Reference Books:

1. Bill Franks, “Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics”, John Wiley & sons, 2012.
2. Glenn J. Myatt, “Making Sense of Data”, John Wiley & Sons, 2007.
3. Pete Warden, “Big Data Glossary”, O’Reilly, 2011.
4. Jiawei Han, MichelineKamber “Data Mining Concepts and Techniques”, Second Edition, Elsevier, second edition , 2006.
5. Alex Holmes, “Hadoop in Pracice” 2012 by Manning Publications,2012.
6. A.Ohri, “R for Business Analytics”, Springer, 2012.
1. Prabhanjan NarayanacharTattar, “R Statistical Application Development by Example Beginner's Guide” ,Packt publishing,2013.

ELECTIVES

IITE 74: ELECTIVE I

UNIX NETWORKING

Unit–I

Introduction: History – Layering – OSI Model – Processes – A Simplified Model – Client Server Model.

The Unix model: Introduction – Basic Definitions – Input and Output – Signals – Process Control – Daemon Processes.

Unit–II : Interprocess Communication

Introduction – File and Record Locking – A simple Client – Server Example – Pipes – FIFOs – Streams and Messages – Name Spaces – System V IPC – queues – Semaphores – shared Memory – Sockets and TLI.

Unit–III : Communication protocols

Introduction – TCP/IP – The internet protocols – XNS – Xerox Network systems – Systems Network Architecture – NetBIOS – OSI Protocols – UUCP – Unix - to - Unix Copy Protocol comparisons.

Unit–IV : Berkeley Sockets

Introduction – Overview – Unix Domain Protocols – Socket Addresses – Elementary Socket System Calls – Advanced Socket System Calls – Reserved Ports – Stream Pipes – Passing File Descriptors – Socket Options – Asynchronous I/O – Input/Output Multiplexing – Out – Of – Band Data – Sockets and Signals – Socket Implementation.

System V Transport Layer Interface: Introduction – Overview – Transport Endpoint Addresses – Elementary TLI Functions – Advanced TLI Functions – Streams – TLI Implementation – Stream Pipes – Passing File Descriptors – Input/Output Multiplexing – Asynchronous I/O - Out - of – Band Data.

Unit–V : Security

Introduction – 4.3 BSD Routines – Kerberos – Time and Date Routines: Introduction – Internet Time and Date Client – Networking Time Synchronization.

Ping Routines: Introduction – Internet Ping Client – XNS Echo Client.

Text Book

1. W. Richard Stevens, "*Unix Network Programming"*, Prentice Hall of India, New Delhi, 1994.

OPTICAL AND SATELLITE COMMUNICATION

Unit–I

Optical Fibers, Structure, Sources and Detector: Optical fiber transmission link, types of fiber, fiber modes and configuration, wave guiding and characteristics, basic optical laws, Numerical Aperture, Fiber materials, fiber fabrication, single mode and multi mode fibers, optical sources, detectors.

Unit–II

Optical Receiver**:** Probability of error, receiver noises, quantum efficiency,block diagram of an optical receiver, digital receiver performance, Receiver sensitivity, point to point links.

Unit–III

Communication Satellite**:** Orbits and inclination, earth coverage and slant range, placement of a communication satellite in geo – stationary orbit, station keeping, communication satellite subsystems, up link and down link, TDMA.

Unit–IV

Earth Station**:** Earth station antenna types, earth station subsystems, pointing loss, G/T ratio, monitoring and control, low noise amplifiers (LNA), up converter & down converter, conversion process, hopping and frequency coordination.

Unit–V

Applications and Services**:** Satellite packet communications – ALOHA, mobile satellite (MSAT) networks, Very Small Aperture Terminals(VSAT), direct broadcasting satellite, INTELSAT, low orbital satellites, TVRO systems.

Text Books

1. J. Gowar, "*Optical Communication Systems"*, PHI, 1993.
2. Keiser, "*Optical Fiber Communications"*, McGraw Hill, 1991.
3. D. Rody, "*Satellite Communication"*, PHI, 1989.

References

1. Dr. D.C. Agarwal, "*Satellite Communications"*, Khanna Publishers.
2. J. Senior, "*Optical Communication – Principles and Practice"*, PHI, 1994.
3. T. Ha, "*Satellite Communications"*, McGraw Hill, 1996.

FAULT TOLERANT SYSTEMS

Unit–I

Introduction: Fault Prevention – Fault Rolerance – Anticipated And Unanticipated Faults – Test Generation For Digital Systems – Combinational Logic Network – Boolean Difference Method – Test Generation For Sequential Circuits – Fault Simulation.

Unit–II

Error Model: General Coding Schemes – Parity Checking Code – Arithmetic Code – Code For Computer Memories – Checking Errors In Logical Operation – Communication Coding.

Unit–III

Fault Tolerance: Coding Techniques – Fault Tolerant – Self Checking and Failsafe Circuits – Fault Tolerance in Combinational and Sequential Circuits – Synchronous and Asynchronous Fail Safe Circuits.

Unit–IV

Architecture: Fault Tolerant Computers – General Purpose Commercial Systems – Fault Tolerant Multiprocessor and VLSI Based Communication Architecture.

Unit–V

Fault Tolerant Software: Design – N-Version Programming – Recovery Block – Acceptance Tests – Fault Trees – Validation of Fault Tolerant Systems.

Text Books

1. K.K. Pradhan, "*Fault Tolerant Computing – Theory and Techniques"*, *Volume – III*, Prentice Hall, 1989.
2. Anderson and Lee, "*Fault Tolerant Principles and Practice"*, PHI, 1989.

HUMAN COMPUTER INTERFACE

Unit–I

Introduction – Digital Audio Representation And Processing – Use of Audio In Computer Applications – Psycho Acoustics – Frequency Range Of Human Hearing – Dynamic Range Of Human Hearing Special Characteristics In Human Hearing – Time Varying Aspects Of Natural Sound – Masking – Binomial Hearing & Localization.

Unit–II

Digital Representation Of Sound – CD Audio, CD – Rom, CD – I – Transmission Of Digital Sound – Digital Audio Signal Processing – Architecture Of An Audio Signal Processing Library – Digital Music Making – Speech Recognition and Generation – Digital Audio and the Computer.

Unit–III

Introduction to Video Technology – Raster Scanning Principles – Touch Screens – Graphics Tablets – Flat Bed Scanners – Track Balls – Mice – Optical Character Recognition – Infra Red Remotes – Projectors – Signature Recognition System.

Unit–IV

World Wide Web Concepts – Elements Of The Web – Web Browsers – Browser Concepts – Browser Home Pages And Start Pages – Elements Of Browser Window – Viewing Pages With A Browser – Search Engines.

Unit–V

Web Database Application Development – Design Consideration – Key Graphical User Interface Concepts – Anatomy Of Window – The Different Types Of Windows – The Different Categories Of Users – User Generic GUI Design – GUI Controls.

References

1. John F. Keogel Buford, "*Multimedia Systems"*, Addison – Wesley, 2000.
2. Tay Vaughan, "*Multimedia Making it Work"*, Tata McGraw Hill, New Delhi, 1999.
3. Margaret Levine Young, "*The Complete Reference – Internet Millennium Edition"*, Tata McGraw Hill, 1999.
4. Ragu Fournder, "*A Methodology for Client/Server and Web Application Development"*, Prentice Hall, 1999.

MULTIMEDIA SYSTEMS

Unit–I : Multimedia Introduction

Elements Of Multimedia System – Needs – Benefits – Converging Technologies – Functions And Subsystems – Input – Development – Output.

Unit–II : Multimedia Hardware

PC Platform – SCSI, MCI(Media Control Interface) – Storage For Multimedia – DVD , CDROM – Input Devices – Output Hardware – Communication Devices.

Unit–III : Media Software

Basic Tools – Image Editing Tools – Painting And Drawing Tools – Sound Editing Programs – Video Formats – Quick Time – Linking Multimedia Objects – OLE And DDE – Office Suites – Presentation Tools – Authoring Tools – Various Types.

Unit–IV : Multimedia Building Blocks

Text Sound – Images – Animation Video.

Unit–V : Multimedia Applications

Multimedia and Single User Multimedia on Networks.

Text Books

1. Tay Vaughan, "*Multimedia Making it Work"*, *Third Edition*, Tata McGraw Hill, 1997.
2. Judith Jeffcoate, "*Multimedia in Practice – Technology and Applications"*, Prentice Hall of India Ltd., 1995.
3. Ralf Steinmetz, Klara Steinmetz, "Multimedia Computing, Communications and Applications", Pearson Education, 2004

E–COMMERCE

Unit–I

Electronic Commerce Framework, Traditional vs. Electronic business applications.

Unit–II

Network infrastructure for E–Commerce – components of the I–Way – Global information distribution networks – public policy issues shaping the I – way. The internet as a network infrastructure.

Unit–III

Network security and firewalls – client server network security – firewalls and network security – data and message security.

Unit–IV

Electronic Commerce and world wide web, consumer oriented E – commerce, Electronic payment systems.

Unit–V

Inter organizational Electronic Commerce supply chain management, Electronic commerce catalogs.

Text Book

1. R. Kalakota, and A.B. Whinston, "*Frontiers of Electronic Commerce"*, Addison Wesley, 1996.

References

1. R. Kalakota, and A.B. Whinston, "*Readings in Electronic Commerce"*, Addison Wesley, 1997.
2. David Kosiur, "*Understanding Electronic Commerce"*, Microsoft Press, 1997.
3. Soka, "*From EDI to Electronic Commerce"*, McGraw Hill, 1995.
4. Saily Chan, "*Electronic Commerce Management"*, John Wiley, 1998.

SOFTWARE QUALITY, CONTROL & ASSURANCE

Unit–I

Introduction: Quality and the quality system – standards and procedures – Technical activities – components – Continuous Improvement – Software Tasks – Management responsibility – Quality system – contract Review – Document Control – Product identification and trace ability.

Process Control and Checking: Identification of Testing Tools – Control of Non conforming product – Corrective action.

Unit–II

Handling, Storage, Packaging and Delivery: Quality records – Internal Quality Audits – Training – Servicing – Statistical techniques.

QA and New technologies: QA and Human – Computer Interface – Process Modelling – Standards and Procedures.

Unit–III

ISO 9001: Elements of ISO 9001 – Improving Quality System – Case Study.

Capability Maturity Model: Structure – Interpretation – Usage – Key process areas for various levels.

Unit–IV

Developing a Test Approach: Addressing Software system business risk – Defining a software system testing strategy – Developing software system testing tactics – testing tools.

Testing a Software Using a Life cycle Methodology: Requirements phase testing – Design phase testing – Program phase testing – Desk debugging and program peer view test tools – Evaluating test results – Installation phase testing – Acceptance testing.

Unit–V

Testing Methodology for Software Maintenance: testing the correctness of the installing a software change – Testing the validity of a software cost estimate – Testing the progress of the software system – Inspecting test plan and test cases – Software Inspection – Costs & Benefits – Overview – The Inspection Process.

Assessing Client – Server and Lan Risks: A testing strategy for a rapid prototyping – Testing techniques – Testing tools.

Test Documentation: Reporting test results – Final test reporting – Evaluating test effectiveness – Use of testing metrics – Improving the test process.

Reference Books

1. Darrel Ince, "*An Introduction to S/W Quality Assurance and its Implementation"*, McGraw Hill Book Company Ltd., 1994.
2. William Perry, "*Effective Methods for Software Testing"*, John Wiley & Sons Inc., 1995.
3. Darrel Ince, "*ISO 9001 and S/W Quality Assurance"*, McGraw Hill Book Company Ltd., 1994.
4. Capers Jones, "*Software Quality – Analysis and Guidelines for Success"*, International Thomson Computer Press, 1997.
5. *"The Capability Maturity Model"*, Carnegie Mellon University Software Engineering Institute, 1997.
6. David L. Goetsch and Stanley Davis, "Introduction to Total Quality", Prentice Hall International Inc., 1997.
7. Mordechai Menachem, "*Software Configuration Management Guide Book"*, McGraw Hill, 1994.

IITE 84: ELECTIVE II

CLIENT – SERVER ARCHITECTURE

Unit–I

Introduction to Client Server computing – main frame centric client/server computing – down sizing and client/Server computing – preserving mainframe application investment through porting – Client/Server development tools – advantages of Client/Server computing.

Unit–II

Components of Client/Server applications – The Client – Client services, request for services, RPC, Windows services, fax/Print services, Remote Boot services, Dynamic data exchange, Object linking and embedding, Common request broker Architecture – the server detailed server functionality – The Networking operating system – Novell Netware – LAN manager – IBM, LAN server – banyan VINES – PC network file services – server operating systems: Netware, OS/2, Windows NT. UNIX – system Application Architecture.

Unit–III

Components of Client/Server Architecture – connectivity – Open System Interconnect (OSI) – Inter process Communication (IPC) – communication interface technology – Wide area network technology – Client/Server development software – platform migration and reengineering of existing system – Hardware components.

Unit–IV

Client /Server systems development – Service and support, System Administration, availability, Reliability, serviceability, software Distribution, performance, Network Management, Remote systems Management security – Training, Training advantages of GUI applications, Systems administrator Training – End user training – the future of Client/Server computing – Enabling technologies – the transformational systems.

Unit–V

Client/Server with distributed objects – distributed objects and components – From ORB to business objects – Compound documents; The client frame work – OLE/DCOM – Client /Server and the internet – web Client/Server – The hypertext era – The interactive era – The Java object era – The distributed object era.

Text Book

1. Patrick Smith and Steve Guengerich, "*Client/Server Computing"*, *Second Edition*, PHI, 2011.

References

1. Dewirer and Dawna Travis, "*Client Server Computing"*, McGraw Hill, 1993.
2. Bethgold – Bernstein, David Macra, "*Designing Enterprise Client/Server Systems"*, PHI, 1998.
3. Thomas S. Ligon, "*Client/Server Communication Services"*, McGraw Hill Series on Client/Server Computing, 1997.
4. Robert Orfali, Dan Harely and Jeri Edward,
"*The Essential Client/Server Survival Guide"*, Second Edition, Galgotia, 1997.

DATA WAREHOUSING & MINING

Unit–I : Data Mining – Introduction

Data mining – Introduction – Information and production factor – Data mining vs. Query tools – Data mining in marketing – Self learning computer systems – Concept learning – Data mining and the Data Warehouse.

Unit–II : Knowledge Discovery Process

Knowledge discovery process – Data selection – Cleaning – Enrichment – Coding – Preliminary analysis of the data set using traditional query tools – Visualization techniques – OLAP tools – Decision trees – Association rules – Neural Networks – Genetic algorithms – KDD(Knowledge Discover in Databases) environment.

Unit–III : Dataware House – Architecture

Data Warehouse Architecture – System process – Process Architecture – Design – Database Schema – Partitioning Strategy – Aggregations – Data Marting – Meta Data – System and Data Warehouse Process Managers.

Unit–IV : Hardware and Operational Design

Hardware and operational design of Data Warehouses – Hardware Architecture – Physical Layout – Security – Backup and Recovery – Service Level Agreement – Operating the Data Warehouse.

Unit–V : Planning, Tuning and Testing

Capacity planning – Tuning the Data Warehouse – Testing the Data Warehouses – Data Warehouse Features.

References

1. Pieter Adriaans and Dolfzantinge, "*Data Mining"*, Addison Wesley, 1996.
2. Sam Anahory and Dennis Murray, "*Data Warehousing in the Real World"*, Addison Wesley, 1996.
3. Sean Kelly, "*Data Warehousing in Action"*, John Wiley, 1997.

SOFTWARE PROJECT MANAGEMENT

Unit–I : Introduction

Defining a software development process – identify the software model, Activities, Relationship among Activities – document Information on each Activity, Tailoring, improving the process. Discipline – Need for – Implementing discipline – Attributes of successful leader.

Communicating in Harmony – personality Traits, Management Tools.

Unit–II : Project Schedule Planning

Top – Down and Bottom – up planning – Initial and final project schedule plans – Types of Activity Relationships – Estimating the duration of an Activity – critical path – Identifying milestones – Activity responsibility matrix – project check list.

Unit–III : Project Tracking

Overview of project progress – project outlook – occurrence of tracking – tracking meetings – Tracking Meeting ground rules – Recovery plans – the role of Escalations.

Unit–IV : Product Requirement and Specifications

Product Requirements – understanding the customer's problem to solve – product objectives – providing direction for the solution – product specifications – Defining the Final product – Development testing – Unit test – function test – function test plan – Anticipating qualities weak link.

Unit–V : Marketing Issues

Vendor Relationships – The vendor contract process – Defining the vendors work – performance Incentives – A trackable plan – Measure performance Routinely – Quality system – proximity to Main Location – Acceptance of Deliverables is shipped product – Non preferential treatment – selecting, replacing a vendor – legal considerations – subcontractors – post project Review – product certification Reviews.

Text Book

1. Neal Whitten: "*Managing Software Development Projects Formula for Success"*, John Wiley and Sons, Inc., 1995.

Reference

1. Watts Humphrey, "*Managing the Software Process"*, Addison Wesley, 1989.
2. Walker Royce- "Software Project Management – A Unified Framework"- Pearson Education- 2004.
3. Ramesh Gopalaswamy- "Maaging Global Projects"- Tata McGrawHill-2001.
4. Bob Hughes- Mikecotterell- "Software Project Management"- 3rd Edition- Tata McGraw Hill-2004.
5. Philip B. Crosby- "Quality is Free: The Art of Making Quality Certain"- Mass Market- 1992.

MOBILE COMPUTING

Unit–I

Introduction – Applications – vehicles – Mobile and Wireless devices – History of wireless communications – Mobile Communication Market – A Simplified and reference model – Overview – Wireless Transmission – Signals – Antennas – Signal Propagation – Multiplexing – Modulation – Spread Spectrum.

Unit–II

Medium Access Control – motivation for a MAC – SDMA – FDMA – TDMA – Comparison of S/T/F/ CDMA. – Telecommunication Systems – GSM – System Architecture – Protocols – DECT – TETRA.

Unit–III

Satellite system – History – Applications – BASICS – GEO 139 – LEO 139 – MEO 140 – Routing – Localization – Handover – Examples – Broad cast Systems – Overview – Cyclic Repetition of data – Digital Video and Audio Broadcasting.

Unit–IV

Mobile Network Layer – Mobile IP – Goals, assumptions – Entities and term logy – IP Packet Delivery – Tunneling and encapsulation – Optimization – Dynamic Host Configuration Protocol – ad hoc networks – Routing – Destination sequence distance vector – Dynamic source routing – Hierarchical algorithms – Alternative metrics.

Unit–V

Mobile Transport layer – Traditional TCP 292 – Congestion control 292 – Slow start 292 – Fast retransmit / fast recovery 293 – Implication on mobility 294 – Indirect TCP – Snooping TCP – Mobile TCP – Fast retransmit / fast recovery – transmission / time – out freezing – selective retransmission – transaction oriented TCP – WAP.

Text Book

1. Jochen Schiler, "*Mobile Communication"*, Addison Wesley, 2000.

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2. P. Honeyman, P., Huston, L.B. "*Communications and Consistency in Mobile File Systems"*, IEEE Personal Communication 2(6), December, 1996.
3. www. awl.com/cseng.
4. www.dect.ch.

SOFTWARE TESTING

UNIT I

Assessing Software Testing Capabilities and Staff competencies – Staff – Roles-Defects –Business Perspective – Quality of Test Process and Testers – Summary. Building a Software Testing Environment – Building a Software Testing Strategy – Strategic Risks – Economics – Problems – Economics of System Development Life Cycle Testing – Organizational Issue – Policy – Structured Approach – Strategy – Methodology – Status –Summary.

UNIT II

Establishing a Software Testing Methodology – Defects – Reduce the Cost – Verification and Validation – Functional and Structural – Workbench Concept – Considerations in Developing Testing Methodologies – Tactics Checklist – Summary. Determining Software Testing Techniques – Tool Selection Process – Selecting Techniques /Tools – Structured System Testing Techniques.

UNIT III

Functional System Testing Techniques – Unit Testing Techniques – Functional Testing and Analysis – Functional Testing – Test Factor / Test Technique Matrix – Summary Selecting and Installing Software Testing Tools – Testing Tools – Selecting and Using the Tools – Managers – Summary.

UNIT IV

The Eleven–Step Testing Process Overview – Cost of Computer Testing – Life Cycle Testing concept – Verification and Validation – Introducing the Eleven-Step Process – Workbench requirement Skills – Summary. Assess Project Management Development Estimate and Status – Overview – Objective – Concerns – Workbench – Develop Test Plan - Overview – Objective – Concerns – Workbench – Requirement Phase Testing -Overview – Objective – Concerns – Workbench – Design Phase Testing - Overview – Objective – Concerns – Workbench – Program Phase Testing – Overview – Objective – Concerns – Workbench – Execute Test and Record Results - Overview –Objective – Concerns – Workbench – Acceptance Test - Overview – Objective – Concerns –Workbench – Report Test Results - Overview – Objective – Concerns – Workbench – Testing Software Installation - Overview – Objective – Concerns – Workbench – Test Software Changes - Overview – Objective – Concerns – Workbench – Evaluate Test Effectiveness - Overview – Objective – Concerns – Workbench.

UNIT V

Testing Specialized Systems and Application – Client / Server Systems - Overview – Objective – Concerns – Workbench – Rapid Application Development - Overview – Objective – Concerns – Workbench – Adequacy of System Documentation - Overview – Objective – Concerns – Workbench – Web Based Systems - Overview – Objective – Concerns – Workbench – Off-the Shelf Software - Overview – Objective – Concerns – Workbench – Multi platform Environment - Overview – Objective – Concerns – Workbench – Security - Overview – Objective – Concerns – Workbench – Data Warehouse - Overview – Objective – Concerns – Workbench.

TEXTBOOK

1. William E.Perry, “Effective Methods for Software Testing”, John Wiley and Sons, Inc.,2000.

REFERENCE:

1. P.C. Jorgensen, “Software Testing A craft Man’s Approach”, CRC Press, 1999.

ENTERPRISE RESOURCE PLANNING

Unit–I : Introduction to ERP

Integrated management Information – Seamless Integration – Supply chain management – Resource management – Integrated data model – Benefits of ERP – Business engineering and ERP – Definition of business engineering – Significance of business Engineering – Principles of business engineering – Business engineering with Information technology.

Unit–II : Business Modeling for ERP

Building the business model – ERP implementation – an overview – Role of consultant, vendors and users – Customization – Precautions – ERP post implementation options. ERP implementation methodology – Guidelines for ERP implementation.

Unit–III : ERP and the Competitive Advantage

ERP domain – MPG/PRO – IFS/Avalon – Industrial and financial systems – Baan IV – SAP – Market dynamics and competitive strategy.

Unit–IV : Commercial ERP Package

Description – multi – client server solution – Open technology – User Interface – Application integration.

Unit–V : Architecture

Basic architecture concepts – The system control Interfaces – Services – Presentation interface – Database interface.

Text Book

1. Vinod Kumar Garg & N.K. Venkita Krishnan, "*Enterpries Resources Planning – Concepts and Practice"*, PHI, 1998.

References

1. Jose Antonio Fernandz, "*The SAP R/3 Handbook"*, TMH, 1998.
2. Sadagopan, "*ERP"*, Tata McGraw Hill, 1999.

IITE 94: ELECTIVE III

CLOUD COMPUTING

Unit -I

Introduction: Basics, applications, intranet and cloud, examples: Amazon, Google, Microsoft, IBM– advantages and disadvantages of cloud computing, Google appengine, Microsoft Azure, Amazon(EC2, S3,SQS),open stack, cloud computing services

Unit -II

Hardware and architecture: clients-security-network-services. Accessing the cloud: platforms-web applications-web APIs-web browsers. Cloud storage: overview-providers. Standards: application-client-infrastructure-service.

Unit -III

Software as Service: overview-driving forces-company offerings-industries. Software plus services: Overview-mobile device integration-providers-Microsoft Online.

Unit -IV

Developing Applications: Google-Microsoft-Intuit QuickBase-Cast Iron Cloud-Bungee Connect-Development(Appengine,Azure, openstack etc.)-trouble shooting and application management.

Unit -V

Local clouds and thin clients: Virtualization-server solutions-thin clients. Cloud Migration: cloud services for individuals-enterprise cloud- methods for migration-analyzing cloud services.

Text Book:

1. Anthony T.Velte, Toby Velte ,"Cloud Computing a practical approach" , Mc Graw Hill, 2010.

Reference Books:

1. M.S.V.Janakiram ,"Demystifying the Cloud – An introduction to Cloud Computing", version 1.1, 2010.
2. Mark C. Chu-Carroll , "Code in the Cloud- Programming Google App Engine", The Pragmatic Bookshelf Raleigh, North Carolina Dallas, Texas, 2011.

DISTRIBUTED COMPONENT ARCHITECTURE

Unit–I : Introduction

EVOLUTION from OLE to DCOM – Distributed Computing – Component concepts – Benefits – Requirements – COM Background – COM Interfaces – COM Library – Foundation of COM.

Unit–II : COM/DCOM

Architectural Overview – COM/DCOM issue – Persistence – Sharing – Scalability – Multitier Architectures – Security – Clustering and Message Queues. MDIL Simplification – Automation – Multithreading – Transaction server.

Unit–III : Programming with COM and DCOM

Type Libraries and language integration – Threads – Active Template Library. COM Programming in Visual Basic and Java.

Unit–IV : CORBA

Introduction to CORBA – Overview of CORBA – Minimal CORBA Application – Core CORBA – OMG IDL – IDL to C++ Mappings – Object Adapter – CORBA Mechanisms – GIOP – IIOP – Dynamic CORBA Issues – CORBA Services.

Unit–V : CORBA and DCOM

Comparison of DCOM and CORBA – Interworking Architectures – Basic Mappings – Integrating DCOM and CORBA – Bridges.

Text Books

1. Roger Sessions, "*COM and DCOM"*, John Wiley & Sons Inc., 1998.
2. Guy Eddon and Henry Eddon, "*Inside Distributed COM"*, Microsoft Press, 1998.
3. Michi Henning and Steve Vinoski, "*Advanced CORBA Programming with C++"*, Addison Wesely, 1999.
4. Michael Rosen and David Curtis, "*Integrating CORBA and COM Application"*, Wiley Computer Publishing, 1998.

References

1. Dale Rogerson, "*Inside COM"*, Microsoft Press, 1997.
2. Don Box, "*Essential COM"*, Addison Wesley, 1998.
3. David S. Platt, "*The Essence of COM with ActiveX, A Programmers Workbench"*, Prentice Hall PTR, 1998.

WIRELESS NETWORKING

Unit–I

Introduction: Uses and advantages of Networks – Structure, Topology & Design. Layered Protocols and OSI Model: Need for Layered Protocol – Design of Layers – Communication between layers – Standards organisations – ISO/OSI Layers.

Unit–II

Control & Accountability – Networks – classification – simplex, stop & Wait, Sliding window protocols – Protocol performance, specification and verification – Polling selection system – Multiplexing carrier sense system.

Binary synchronous control (BSC) – High level data link control (HDLC) – Synchronous data link control (SDLC).

Local area Networks: characteristics of LAN – LAN standards (IEEE 802, ISDN), LAN Topologies and protocol switching – Routing, congestion.

Unit–III

Personal Computer Networks: PC Communication Characteristics – Error handling – PC as server – Linking PC with mainframes – File Transfer – PC and LAN.

Upper Level Protocols: Network security – Encryption with Private, public keys – Data Encryption standard – ISO security recommendations – Telematics – Electronic mail – protocols for file management.

Unit–IV

Wireless Network: Security mechanism – holes in wireless network – wireless VPN 802.11 CSMA KA – mobile application.

Unit–V

Wireless application protocol WAP – Arch – WAE – WTA frame work – WAP Push services – WAP – protocol stack overview of wireless in local loop.

Text Book

1. Ulyess Black, "*Computer Networks"*, PHI. 1987. (Chapters 1 to 4,6,7,11 and 13).

References

1. Andrew S. Tannenbaum, "*Computer Networks"*, PHI, 1989.
2. Ulyess Black, "Data Communications & Distributed Networks", PHI, 1987.
3. Ahuja, "Design and Analysis of Computer Communication Networks", McGraw Hill, 1985.
4. Forouzan, "Introduction to Data Communication and Networking", McGraw Hill, 1998.

NEURAL NETWORK & FUZZY SYSTEMS

Unit–I

Introduction – Principles and Promises – Perception – Representation – Linear Seperability – Learning – Training algorithm – Backpropagation Training Algorithm – Applications – Counter propagation networks – Network structure – Applications.

Unit–II

Statistical Methods: Boltzmann's Training – Cauchy Training. Hopfield nets – Associative memory – Applications – Bidirectional Associative Memory(BAM) – Continuous BAM – Adaptive – Competitive.

Unit–III

Adaptive Resonance Theory – Overview – Architecture – Classification – Implementation. Optical Neural Network – Holographic correlators – Cognition and Neocognition – Structure – Training.

Unit–IV : Fuzzy Sets

Classical sets to Fuzzy sets – Fuzzy sets versus CRISP sets – operations on Fuzzy sets – Fuzzy arithmetic and Fuzzy relations – Applications.

Unit–V

Fuzzy logic – Control – Applications – Fuzzy Systems – Pattern Recognition – Fuzzy databases and Information Retrieval Systems.

Text Book

1. Beale R. and Jackson T. "*Neural Computing an Introduction"*, Adam Hilger, 1990.

References

1. Igor Aleksander and Helen Morton, "*An Introduction to Neural Computing"*, Chapman and Hall, 1990.
2. Philip D. Wasserman, "*Neural Computing Theory and Practice"*, Anza Research, Van Nostrand Reinhold, New York, 1989.
3. George J. Klir and Bo Yuan, "*Fuzzy Sets and Fuzzy Logic Theory and Applications*, PHI. 1995. (Chapters – 1,2,3, 4,5,8,12,13 & 14).

NATURAL LANGUAGE PROCESSING

Unit–I : Introduction

Introduction – the issues and difficulties in NLP – study of language – Language understanding – Evaluating Language understanding systems – The different levels of language analysis – Representation and understanding – The organization of natural language understanding systems – Linguistic background – Understanding of spoken, written and textual information.

Unit–II : Grammars and Parsing

Grammars and sentence structures – A top down parser – A bottom up parser – top down chart parsing – Finite state models and morphological analysis and the Lexicon – Grammars and Logic programming – Augmented grammars – A simple grammar with features – Augmented Transition Networks (ATN) – Define clause grammars – Efficient parsers – Shift reduce parsers – A deterministic parsers.

Unit–III : Semantic Interpretation

Semantics and logical forms – Defining semantic structure: Model theory – Semantic interpretation and composability – A simple grammar and lexicon with semantic interpretation – Prepositional phrases and verb phrases – Lexicalized semantic interpretation and semantic roles – Semantic networks – Frames and scripts.

Unit–IV : Discourse Interpretation

Defining Local Discourse context and Discourse entities – The need for discourse structure – Discourse structure and references – Discourse interpretation – discourse analysis – pragmatics – ambiguity and levels of language processing – semantic and pragmatic roles of noun phrases.

Unit–V : Typical Systems

Generation – Strategies for generation – Planning English referencing expressions – KING a natural language generation systems – typical systems – ELIZA – Baseball – GUS – PARRY – LADDER – SOPHIE & POET – Current trends in NLP.

Text Book

1. James Allen, "*Natural Language Understanding"*, Benjamin Cummings, 1995.

References

1. Gerald Gazer and Chris Mellish, "*Natural Language Processing for PROLOG Programmers"*, PHI, 1995.
2. Askhar Bharathi, Vineet chaitanya and Rajeev Sangal, "*Natural Language Processing – a Paining Perspective"*, PHI, 1995.
3. Ralph Grishman, "*Computational Linguistics – An Introduction"*, Cambridge University Press, 1986.
4. Gros, Jones & Webber, "*Readings in Natural Language Processing"*, Morgan Konfman Publishers, 1986.
5. Popov, "*Talking with Computers in Natural Language"*, Springer – Verlag, 1986.

GLOBAL POSITIONING SYSTEM & REMOTE SENSING

Unit–I

Introduction – GPS details – GPS errors and biases – datums – Co – ordinate systems and map projections – GPS positioning modes – Ambiguity resolution techniques.

Unit–II

GPS data and correction services – GPS standard formats – GPS Integration – GPS applications – other satellite navigation systems.

Unit–III

Remote sensing of the environment – Electromagnetic radiation principles – history of aerial photography and aerial platforms – Aerial photography: Vantage point, cameras, filters and film.

Unit–IV

Elements of visual image interpretation – Introduction photogrammetry – multispectral remote sensing – Thermal Infrared remote sensing – Active and passive microwave and LIDAR remote sensing.

Unit–V

Remote sensing vegetation – Remote sensing the urban landscape – remote sensing water – remote sensing soils, minerals and land forms.

Text Books

1. Ahmed EI. Rabbany, "*Introduction to GPS: The Global Positioning System"*, Artech House, 1st Edition, 2002. ISBN – 1 – 58053 – 183 – 0.
2. John R. Jensen, "*Remote Sensing of the Environment: An Earth Resource Perspective"*, Prentice Hall, 2nd Edition, 2000.

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1. Kenichi Okamoto, "*Global Environment Remote Sensing"*, IOS Press, 2000.
2. Thomas M. Lillesand, Ralph W. Kiefer, "*Remote Sensing and Image Interpretation"*, 4th Edition, John Wiley & Sons, 1999.
3. Elliott D. Kaplan, "*Understanding GPS: Principles and Applications"*, Artech House Telecommunications Library, Artech House, 1996.

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