AMRITA
VISHWA VIDYAPEETHAM

Program

BCA (Bachelor of Computer Applications)

Faculty of Science

(Revised with effect from 2018-19 AY onwards)

Table of Contents

Programme Outcomes

PO1 Acquire knowledge of Computing Fundamentals, Basic Mathematics, Computing Specialization, and Domain Knowledge of proper computing models from defined problems.

PO2 Analyse and synthesis computing systems through quantitative and qualitative techniques

PO3 Modern tool usage for Design and Development - Able to analyze and identify the customer requirements in multidisciplinary domains, create high level design and implement robust software applications using latest technological skills.

PO4 Capable of adapting to new technologies and constantly upgrade their skills with an attitude towards independent and lifelong learning.

PO5 Communicate effectively in both verbal and written form.

PO6 Perform professionally with social, cultural and ethical responsibility as an individual as well as in multifaceted teams with positive attitude.

Programme Specific Outcomes

PSO1: To understand the fundamentals of various aspects under CS domain

PSO2: Attain the practical exposures and develop diverse applications. The ability to employ modern computer languages and applications for their successful career, to create platforms to become an entrepreneur and a relish for higher studies.

PSO3: Attain the ability to design and develop computer applications, evaluate and recognize potential risks and provide innovative solutions

CURRICULUM STRUCTURE

for 2018 admissions onwards

GENERAL INFORMATION

Code Numbering:

Each course is assigned an 8-character Code number. The first two digits indicate the year of curriculum revision. The next three letters indicate the Department offering the course. The last three digits are unique to the course – the first digit indicates the level of the course (100, 200, 300, 400 etc.); the second digit indicates the type of the course, viz. 0, 1 and 2 indicate the core courses; 3,4,5,6 and 7 indicate the Elective courses; 8 indicates the Lab. or practical-based courses and 9 indicates Projects**.**

ABBREVIATIONS USED IN THE CURRICULUM:

Cat - Category
Cr - Credits
ES - Exam Slot
L - Lecture
P - Practical
T - Tutorial

DISCIPLINES

AVP - Amrita Values Programmes
BUS - Business Management
CHY - Chemistry
CMJ - Communication and Journalism
COM -Commerce
CSA - Computer Science and Applications
CSN - Computer Systems and Network
CUL - Cultural Education
ECO - Economics
ELL - English Language and Literature
ENG - English
ENV - Environmental Sciences
FNA - Fine Arts
HIN - Hindi
KAN - Kannada
LAW - Law
MAL - Malayalam
MAT - Mathematics

MCJ - Mass Communication and Journalism
OEL - Open Elective
PHY - Physics
SAN - Sanskrit
SSK - Soft Skills
SWK - Social Work
TAM - Tamil

BCA (Bachelor of Computer Applications)-2018

Course Code	Course Title	L T P	Cr	ES	Course Code	Course Title	L T P	Cr	ES
SEMESTER 1					**SEMESTER 2**				
18CUL101	Cultural Education I	2 0 0	2		18CUL111	Cultural Education II	2 0 0	2	
18ENG101	Communicative English	2 0 2	3		18ENG121	Professional Communication	1 0 2	2	
	Language I	2 0 0	2			Language II	1 1 0	2	
18MAT102	Mathematical Foundation	3 1 0	4		18MAT112	Discrete Mathematics	3 1 0	4	
18ENV300	Environmental Science and Sustainability	3 0 0	3		18CSA114	Database Management System	3 1 0	4	
18CSA103	Computer Essentials	3 0 2	4		18CSA113	Programming in C	3 1 0	4	
18CSA101	Computational Thinking and Problem Solving	3 0 0	3		18CSA111	Computer Organization	3 1 0	4	
18CSA182	Computational Thinking and Problem Solving Lab	0 0 2	1		18CSA183	Database Management System Lab	0 0 2	1	
					18CSA184	Programming in C Lab	0 0 2	1	
	TOTAL		**22**			TOTAL		**24**	
SEMESTER 3					**SEMESTER 4**				
18AVP201	Amrita Value Programme I	1 0 0	1		18AVP211	Amrita Value Programme II	1 0 0	1	
18SSK201	Life Skills I	1 0 2	2		18SSK211	Life Skills II	1 0 2	2	
18MAT208	Statistical and Numerical Methods	3 1 0	4		18CSA214	Computer Networks	3 1 0	4	
18CSA209	Data Structures and Algorithms	3 1 0	4		18CSA215	Java Programming	3 1 0	4	
18CSA206	Object Oriented Programming using C++	3 1 0	4		18CSA216	Web Technologies	3 1 0	4	
18CSA201	Operating System	3 1 0	4		18CSA211	Software Engineering	3 0 2	4	
18CSA207	Principles of Management and Accounting	3 0 0	3			Open Elective A	3 0 0	3	
18CSA283	Data Structures and Algorithms Lab	0 0 2	1		18CSA285	Java Programming Lab	0 0 2	1	
18CSA284	Object Oriented Programming using C++ Lab	0 0 2	1		18CSA286	Web Technologies Lab	0 0 2	1	
	TOTAL		**24**			TOTAL		**24**	
SEMESTER 5					**SEMESTER 6**				
18SSK301	Life skills III	1 0 2	2		18CSA317	Computer Graphics	3 0 0	3	
18CSA307	C# and .NET Framework	2 0 2	3		18CSA318	Cryptography and Cyber Security	4 0 0	4	
18CSA306	Advanced Java and J2EE	3 0 0	3		18CSA319	Python Programming	2 0 2	3	
	Elective A	3 0 0	3			Elective B	3 0 0	3	
18CSA390	Live in Labs / Open Elective B	3 0 0	3		18CSA383	Computer Graphics Lab	0 0 2	1	
18CSA389	Mobile Application Development Lab	0 1 2	2		18CSA399	Project		6	
18CSA388	Advanced Java and J2EE Lab	0 0 2	1						
18CSA391	Comprehensive Technical VIVA-Voce		2						
18CSA392	Minor Project		3						
	TOTAL		**22**			TOTAL		**20**	
LANGUAGES									
	Paper I					**Paper II**			
18HIN101	Hindi I	1 0 2	2	B	18HIN111	Hindi II	1 0 2	2	B
18KAN101	Kannada I	1 0 2	2	B	18KAN111	Kannada II	1 0 2	2	B
18MAL101	Malayalam I	1 0 2	2	B	18MAL111	Malayalam II	1 0 2	2	B
18SAN101	Sanskrit I	1 0 2	2	B	18SAN111	Sanskrit II	1 0 2	2	B
18TAM101	Tamil I	1 0 2	2	B	18TAM111	TAMIL II	1 0 2	2	B

Elective A, B				
18CSA311	Artificial Intelligence	3 0 0	3	E
18CSA332	Architecture and Deployment of Secure and Scalable WAN	3 0 0	3	E
18CSA333	Client Server Computing	3 0 0	3	E
18CSA334	Embedded Systems	3 0 0	3	E
18CSA335	Enterprise Resource Planning Management	3 0 0	3	E
18CSA336	Knowledge Management	3 0 0	3	E
18CSA337	LAN Switching and Advanced Routing	3 0 0	3	E
18CSA338	Micro Processor Systems	3 0 0	3	E

	18CSA339	Multimedia and Graphics	3 0 0	3	E
	18CSA340	Social and Professional Issues in Computing	3 0 0	3	E
	18CSA341	Soft Computing	3 0 0	3	E
	18CSA342	Systems and Network Administration	3 0 0	3	E

* Two Open Elective courses are to be taken by each student, one each in the 4th and the 5th semesters, from the list of Open Electives offered by the School.

@ Students undertaking and registering for a Live-in-Lab project, can be exempted from registering for an Open Elective course in the fifth semester.

OPEN ELECTIVES

Course Code	Course Title	L – T – P	Cr.	ES
18OEL231	Advertising	3 0 0	3	J
18OEL232	Basic Statistics	3 0 0	3	J
18OEL233	Citizen Journalismh	3 0 0	3	J
18OEL234	Creative Writing for Beginners	3 0 0	3	J
18OEL235	Desktop Support and Services	3 0 0	3	J
18OEL236	Development Journalism	3 0 0	3	J
18OEL237	Digital Photography	3 0 0	3	J
18OEL238	Emotional Intelligence	3 0 0	3	J
18OEL239	Essence of Spiritual Literature	3 0 0	3	J
18OEL240	Film Theory	3 0 0	3	J
18OEL241	Fundamentals of Network Administration	3 0 0	3	J
18OEL242	Gender Studies	3 0 0	3	J
18OEL243	Glimpses of Indian Economy and Polity	3 0 0	3	J
18OEL244	Graphics and Web-designing Tools	3 0 0	3	J
18OEL245	Green Marketing	3 0 0	3	J
18OEL246	Healthcare and Technology	3 0 0	3	J
18OEL247	History of English Literature	3 0 0	3	J
18OEL248	Indian Writing in English	3 0 0	3	J
18OEL249	Industrial Relations and Labour Welfare	3 0 0	3	J
18OEL250	Introduction to Ancient Indian Yogic and Vedic Wisdom	3 0 0	3	J
18OEL251	Introduction to Computer Hardware	3 0 0	3	J
18OEL252	Introduction to Event Management	3 0 0	3	J
18OEL253	Introduction to Media	3 0 0	3	J
18OEL254	Introduction to Right to Information Act	3 0 0	3	J
18OEL255	Introduction to Translation	3 0 0	3	J
18OEL256	Linguistic Abilities	3 0 0	3	J

18OEL257	Literary Criticism and Theory	3 0 0	3	J
18OEL258	Macro Economics	3 0 0	3	J
18OEL259	Managing Failure	3 0 0	3	J
18OEL260	Media Management	3 0 0	3	J
18OEL261	Micro Economics	3 0 0	3	J
18OEL262	Micro Finance, Small Group Management and Cooperatives	3 0 0	3	J
18OEL263	Negotiation and Counselling	3 0 0	3	J
18OEL264	New Literatures	3 0 0	3	J
18OEL265	Non-Profit Organisation	3 0 0	3	J
18OEL266	Personal Effectiveness	3 0 0	3	J
18OEL267	Perspectives in Astrophysics and Cosmology	3 0 0	3	J
18OEL268	Principles of Marketing	3 0 0	3	J
18OEL269	Principles of Public Relations	3 0 0	3	J
18OEL270	Science, Society and Culture	3 0 0	3	J
18OEL271	Statistical Analysis	3 0 0	3	J
18OEL272	Teamwork and Collaboration	3 0 0	3	J
18OEL273	The Message of Bhagwad Gita	3 0 0	3	J
18OEL274	Understanding Travel and Tourism	3 0 0	3	J
18OEL275	Videography	3 0 0	3	J
18OEL276	Vistas of English Literature	3 0 0	3	J
18OEL277	Web-Designing Techniques	3 0 0	3	J
18OEL278	Organic Farming	3 0 0	3	J
18OEL279	Basic Legal Awareness on Protection of Women and Rights	3 0 0	3	J
18OEL280	Ritual Performances of Kerala	3 0 0	3	J
18OEL281	Documenting Social Issues	3 0 0	3	J
18OEL282	Fabrication of Advanced Solar Cell	3 0 0	3	J
18OEL283	Basic Concepts of X-ray Diffraction	3 0 0	3	J
18OEL284	Introduction to FORTRAN and GNUPLOT	3 0 0	3	J
18OEL285	Introduction to Porous Materials	3 0 0	3	J
18OEL286	Forensic Science	3 0 0	3	J
18OEL287	Introduction to solar Physics	3 0 0	3	J
18OEL288	Recycling Recovery and Treatment Methods for Wastes	3 0 0	3	J
18OEL289	Acting and Dramatic Presentation	2 0 2	3	J
18OEL290	Computerised Accounting	2 0 2	3	J
18OEL291	Kerala Mural Art and Painting	2 0 2	3	J
18OEL292	Painting	2 0 2	3	J
18OEL293	Reporting Rural Issues	3 0 0	3	J

EVALUATION SCHEME AND GRADING SYSTEM

R.13 Assessment Procedure

R.13.1 The academic performance of each student in each course will be assessed on the basis of Internal Assessment (including Continuous Assessment) and an end-semester examination.
Normally, the teachers offering the course will evaluate the; performance of the students at regular intervals and in the end-semester examination.
In theory courses (that are taught primarily in the lecture mode), the weight for the Internal
Assessment and End-semester examination will be 50:50. The Internal assessment in theory courses shall consist of at least two periodical tests, weekly quizzes, assignments, tutorials, viva-voce etc. The weight for these components, for theory-based courses shall be 20 marks for the Continuous assessment, comprising of Quizzes, assignments, tutorials, viva-voce, etc. and 15 marks each for both the Periodical Tests.
At the end of the semester, there will be an end-semester examination of three hours duration, with a weight of 50 marks, in each lecture-based course.

R.13.2 In the case of laboratory courses and practical, the relative weight for Internal assessment and
End-semester examination will be 80:20. The weight for the components of Internal assessment will be decided by the course committee/class committee at the beginning of the course.
Evaluation pattern for course having both Theory and Lab. components:
Courses having only one hour per week for lecture/tutorial, be treated as a Lab. course, for evaluation purposes; and evaluation pattern will be 80 marks for continuous assessment of lab. work and 20 marks for end-semester lab. examination.
Courses having two hours per week for theory and/or tutorials, be given a weight of 60 marks and 40 marks for the Theory and Lab. components, respectively; The Lab. Component evaluation will be based on continuous evaluation, without any end-semester practical evaluation. 10 marks will be for continuous assessment of the theory portion, 10 marks for each of the two periodical tests, 30 marks for the theory end-semester examination and 40 marks for continuous assessment of lab. Work and Courses having three hours per week for theory and/or tutorials, be given a weight of 70 marks and 30 marks for the Theory and Lab. components, respectively; The Lab. component evaluation will be based on continuous evaluation, without any end semester practical evaluation. 15 marks will be for continuous assessment of the theory portion, 10 marks for each of the two periodical tests, 35 marks for the theory end-semester examination and 30 marks for continuous assessment of lab. work.

R.13.3 It is mandatory that the students shall appear for the end-semester examinations in all theory and practical courses, for completion of the requirements of the course. Those who do not appear in the end-semester examinations will be awarded ‘F’ grade, subject to meeting the attendance requirement.

At the end of a semester, examinations shall be held for all the subjects that were taught during that semester and those subjects of the previous semesters for which the students shall apply for supplementary examination, with a prescribed fee.

R.13.4 PROJECT WORK: The continuous assessment of project work will be carried out as decided by the course committee. At the completion of the project work, the student will submit a bound volume of the project report in the prescribed format. The project work will be evaluated by a team of duly appointed examiners.
The final evaluation will be based on the content of the report, presentation by student and a viva-voce examination on the project.
There will be 40% weight for continuous assessment and the remaining 60% for final evaluation. If the project work is not satisfactory he/she will be asked to continue the project work and appear for assessment later.

R.14 PUBLICATION / INTERNSHIP

R.14.1 All students, if they are to be considered for award of Distinction at the time of graduation, are required to have published ONE paper in Scopus-indexed Journal/Conference.
Students with 8.0 and above CGPA from the UG Programme of Visual Media, at the end of the course, producing an output like Video Production / Animation / Portfolio / Graphic
Output / Feature / Documentary / Programme etc. and the same to be judged by a panel which consists of at least ONE industry / Academic External Expert identified by the Department can be considered in lieu of mandatory publication.

R.14.2 Additional 10 marks will be awarded for each Publication, subject to a maximum of ONE paper per semester.
The additional marks shall be awarded in the semester in which the paper is published or presented, if applied for, within 10 days of the publication of results of the concerned semester. The additional marks can be awarded to any course(s) where the student has to improve his/her grade.

R.14.3 All publications shall be in Scopus-indexed Journals/Conferences and shall be as per the guidelines prescribed by the University.

R.14.4 Students who have undergone Internship at reputed organisations or National / International Institutions, with the prior approval of the concerned Departmental Chairperson and the Head of the School, may be considered for waiver of the requirement of publication, for the award of Distinction. However, the decision of the Departmental Chairperson and the Head of the concerned School, in this regard, shall be final.

R.14.5 Co-curricular Activities
The students during their period of study in the University are encouraged to indulge in sports, arts, Social/Community service and Seva activities. Bonus marks (5 to 10 marks) shall be awarded for representing AMRITA University in Sports, Cultural and Seva activities. The procedure for awarding these marks will be published by the University from time to time.

R.15 REMEDIAL PROVISIONS

R.15.1 Supplementary Examinations:

Students failed in a non-semester course (i.e. courses not registered by the student during the current semester), shall apply for appearance in the respective examination by paying a prescribed fee and take the examination.

A student who has secured an 'F' grade in a course may take the supplementary examination for a maximum of three additional attempts (excluding the regular end-semester examinations) carrying the previous Internal marks earned by them. Students failing to pass the course after three additional attempts shall henceforth appear for the supplementary examination for the entire 100 marks and the internal assessment marks earned by them in the regular registration, shall not be considered.

If a student wishes to improve his/her internal marks, he/she can do so, by re-registering for the course by choosing any of the appropriate remedial options. In this case, the internal marks obtained by the student will be valid for the end-semester of the reregistration and three more additional attempts.

R.15.2 Other options:

Certain courses may be offered as run-time-redo or as contact courses, as and when necessary to enable students who have dropped courses or failed in some courses, to register and endeavor to complete them.

a) Re-registration: Students who have failed in a course and opt to re-do the course may do so by re-registering for the course, along with a junior batch of students,

b) Run-time re-do: Certain courses may be offered specially for the benefit of failed students during the semester, on a regular pattern.

The above two modes, enable possible improvement of the Internal assessment marks.

c) Contact courses: Final-semester students and term-out students (students who have completed three-year period) may register for contact mode, to clear the failed courses, if any, subject to the approval of the Head of the School. A maximum of only two courses, can be taken under contact mode, in the entire programme of study.

R.15.3 Supplementary examinations will be evaluated against the most recent grade rule (whenever the course was offered recently in the regular semester).

R.16 Grading

R.16.1 Based on the performance in each course, a student is awarded at the end of the semester, a letter grade in each of the courses registered.

Letter grades will be awarded by the Class Committee in its final sitting, without the student representatives.

The letter grades, the corresponding grade points and the ratings are as follows:

Letter Grade	Grade Points	Ratings
O	10.00	Outstanding
A+	9.50	Excellent
A	9.00	Very Good
B+	8.00	Good
B	7.00	Above Average

C	6.00	Averages
P	5.00	Pass
F	0.00	Fail
FA	0.00	Failed due to insufficient attendance
I	0.00	Incomplete (awarded only for Lab.courses/ Project / Seminar)
W		Withheld

R.16.2 'FA'grade once awarded stays in the record of the student and is replaced with the appropriate grade when he/she completes the course successfully later.
Students who have secured an 'FA' in a course must re-register for the course or register for the course, if offered, under run-time re-do mode.

R.16.3 A student who has been awarded 'I' Grade in a Lab course, due to reasons of not completing the Lab., shall take up additional Lab. whenever offered next and earn a pass grade, which will be reflected in the next semester's grade sheet.
The 'I' grade, awarded in a Project/Seminar course, will be subsequently changed into appropriate grade, when the student completes the requirement during the subsequent semester. If he/she does not complete it in the next semester, it will be converted to 'F' grade.

R.16.4 A student is considered to have successfully completed the course and earned the credit, if he/she scores a letter grade 'P' or better in that course.

R.17 Declaration of Result
After finalization of the grades by the Class Committee and subsequent approval of the Head of the School, the result will be announced by the Controller of Examinations.

BCA (Bachelor of Computer Applications)-2018

COURSE OBJECTIVES, COURSE OUTCOMES, SYLLABUS

SEMESTER I

18CUL101 CULTURAL EDUCATION I 2 0 0 2

Course objective
This course mainly focuses on educating students on values, ethics and culture to be followed for a better living.

Course outcomes

CO1	Get an awareness of culture
CO2	Get a knowledge of universal peace
CO3	Get an idea on fulfilling the purpose of life
CO4	To get an unbiased understanding of traditional social structure

CO5	Develop respect for traditions, customs & rituals

Introduction to Indian Culture
Introduction to Amma's life and Teachings
Symbols of Indian Culture
Science and Technology in Ancient India
Education in Ancient India
Goals of Life – Purusharthas
Introduction to Vedanta and Bhagavad Gita
Introduction to Yoga
Nature and Indian Culture
Values from Indian History
Life and work of Great Seers of India (1)

TEXTBOOKS:

1. *The Glory of India (in- house publication)*
2. *The Mother of Sweet Bliss. (Amma's Life & Teachings)*

18ENG101 Communicative English 2-0-2-3

Objectives:

To help students obtain an ability to communicate fluently in English; to enable and enhance the students skills in reading, writing, listening and speaking; to impart an aesthetic sense and enhance creativity

Course outcomes

CO1	Acquire working knowledge of grammar and syntax;
CO2	Competence in writing descriptive prose
CO3	Attain upper intermediate level vocabulary
CO4	Develop ability to read and comprehend
CO5	Develop ability to speak clearly and fluently on a given topic

Course Contents:

Unit I

Kinds of sentences, usage of preposition, use of adjectives, adverbs for description, Tenses, Determiners- Agreement (Subject – Verb, Pronoun- Antecedent) collocation, Phrasal Verbs, Modifiers, Linkers/ Discourse Markers, Question Tags

Unit II

Paragraph writing – Cohesion - Development: definition, comparison, classification, contrast, cause and effect - Essay writing: Descriptive and Narrative

Unit III

Letter Writing - Personal (congratulation, invitation, felicitation, gratitude, condolence etc.) Official (Principal / Head of the department/ College authorities, Bank Manager, Editors of newspapers and magazines)

Unit IV

Reading Comprehension – Skimming and scanning- inference and deduction – Reading different kinds of material –Speaking**:** Narration of incidents / stories/ anecdotes- Current News Awareness

Unit V

Prose: John Halt's 'Three Kinds of Discipline' [**Detailed**]

Max Beerbohm's 'The Golden Drugget' [**Detailed**]

Poems: Ogden Nash- 'This is Going to Hurt Just a Little Bit' [**Detailed**]

Robert Kroetsch– 'I am Getting Old Now', Langston Hughes-'I, Too'[**Detailed**]

Wole Soyinka- 'Telephone Conversation' **[Non-Detailed**]

Kamala Das- 'The Dance of the Eunuchs'[**Non-Detailed**]

Short Stories:Edgar Allan Poe's 'The Black Cat', Ruskin Bond's 'The Time Stops at Shamili' **[Non-Detailed**]

CORE READING:

1. *Ruskin Bond, Time Stops at Shamli and Other Stories, Penguin Books India Pvt Ltd, 1989*
2. *Syamala, V. Speak English in Four Easy Steps, Improve English Foundation Trivandrum: 2006*
3. *Beerbohm, Max, The Prince of Minor Writers: The Selected Essays of Max Beerbohm (NYRB Classics), Phillip Lopate (Introduction, Editor), The New York Review of Book Publishers.*
4. *Edger Allan Poe. The Selected Works of Edger Allan Poe. A Running Press, 2014.*
5. *Online sources*

References:

6. *Ruskin Bond, Time Stops at Shamli and Other Stories, Penguin Books India Pvt Ltd, 1989*
7. *Martinet, Thomson, A Practical English Grammar, IV Ed. OUP, 1986.*
8. *Murphy, Raymond, Murphy's English Grammar, CUP, 2004*
9. *Online sources*

18MAT102 MATHEMATICAL FOUNDATION 3 1 0 4

Course outcomes

CO1	Study and solve problems related to connectives , predicates and quantifiers under different situations.
CO2	Develop basic knowledge of matrices and to solve equations using Cramer's rule.
CO3	Know the concept of eigen values .
CO4	To develop the knowledge about derivatives and know various applications of differentiation.
CO5	Understand the basic concepts of Mathematical reasoning, set and functions

Unit 1

Basic concepts of set theory - Mathematical logic-introduction-statements-connectives-negation,

conjunction, disjunction- statement formulas and truth tables- conditional and bi-conditional statements-tautology-contradiction-equivalence of formulas-duality law-Predicates and Quantifiers, Arguments.

Unit 2

Operations on sets - power set- venn diagram Cartesian product-relations -functions- types of functions - composition of functions.

Unit 3

Matrix algebra-Introduction-Types of matrices-matrix operations- transpose of a matrix -determinant of matrix - inverse of a matrix- Cramer's rule

Unit 4

Matrix: finding rank of a matrix - normal form-echelon form-Cayley Hamilton theorem-Eigen values

Unit 5

Differential calculus - Functions and limits - Simple Differentiation of Algebraic Functions — Evaluation of First and Second Order Derivatives – Maxima and Minima

TEXT BOOKS:

P.R.Vittal-Business Mathematics and Statistics,MarghamPublications,Chennai,

REFERENCE:

B.S.Vatsa-Discrete Mathematics –New Age International Limited Publishers,New Delhi

18ENV300 ENVIRONMENTAL SCIENCE AND SUSTAINABILITY 3 0 0 3

Objectives:

Encouraging students to develop a fundamental knowledge of Environmental Education; To make them understand how local, regional, state, national & international laws and regulations influence environmental decisions; Telling the importance of developing an environmentally literate populace

Course outcomes

CO1	Understanding sustainable developements, need for environmental education, Contribution of famous personalities in Environment.
CO2	Make out the abiotic and biotic factors of environment, Understanding the importance of different types of ecosystems
CO3	Study of biodiversity , different types of diversity in nature giving importance to

	India as a mega diversity nation.
CO4	Understanding linear and cyclic resource management with more emphasis to air, water, soil resources.
CO5	Be familiar with Environment Impact Assessment & Environment Management Plan
CO6	Understanding sustainable developments, need for environmental education, Contribution of famous personalities in Environment.

Unit 1

State of Environment and Unsustainability, Need for Sustainable Development, Traditional conservation systems in India, People in Environment, Need for an attitudinal change and ethics, Need for Environmental Education, Overview of International Treaties and Conventions, Overview of Legal and Regulatory Frameworks.

Environment: Abiotic and biotic factors, Segments of the Environment, Biogeochemical Cycles, Ecosystems (associations, community adaptations, ecological succession, Food webs, Food chain, ecological pyramids), Types of Ecosystems – Terrestrial ecosystems, Ecosystem Services, Economic value of ecosystem services, Threats to ecosystems and conservation strategies.

Biodiversity: Species, Genetic & Ecosystem Diversity, Origin of life and significance of biodiversity, Value of Biodiversity, Biodiversity at Global, National and Local Levels, India as a Mega-Diversity Nation (Hotspots) & Protected Area Network, Community Biodiversity Registers. Threats to Biodiversity, Red Data book, Rare, Endangered and Endemic Species of India. Conservation of Biodiversity. People's action.

Impacts, causes, effects, control measures, international, legal and regulatory frameworks of: Climate Change, Ozone depletion, Air pollution, Water pollution, Noise pollution, Soil/ land degradation/ pollution

Unit 2

Linear vs. cyclical resource management systems, need for systems thinking and design of cyclical systems, circular economy, industrial ecology, green technology. Specifically apply these concepts to: Water Resources, Energy Resources, Food Resources, Land & Forests, Waste management.

Discuss the interrelation of environmental issues with social issues such as:
Population, Illiteracy, Poverty, Gender equality, Class discrimination, Social impacts of development on the poor and tribal communities, Conservation movements: people's movements and activism, Indigenous knowledge systems and traditions of conservation.

Unit 3

Common goods and public goods, natural capital/ tragedy of commons, Cost benefit analysis of development projects, Environment Impact Assessment (EIA), Environment Management Plan (EMP), Green business, Eco-labeling, Problems and solutions with case studies.

Global and national state of housing and shelter, Urbanization, Effects of unplanned development case studies, Impacts of the building and road construction industry on the environment, Eco-homes/ Green buildings, Sustainable communities, Sustainable Cities.

Ethical issues related to resource consumption, Intergenerational ethics, Need for investigation and resolution of the root cause of unsustainability, Traditional value systems of India, Significance of holistic value-based education for true sustainability.

TEXTBOOKS/ REFERENCES:

1. *R. Rajagopalan, Environmental Studies: From Crisis to Cure. Oxford University Press, 2011, 358 pages. ISBN: 9780198072089.*
2. *Daniel D. Chiras, Environmental Science. Jones & Bartlett Publishers, 01-Feb-2012, 669 pages. ISBN: 9781449645311.*
3. *Andy Jones, Michel Pimbert and Janice Jiggins, 2011. Virtuous Circles: Values, Systems, Sustainability. IIED and IUCN CEESP, London. URL:http://pubs.iied.org/pdfs/G03177.pdf*
4. *Annenberg Learner, The Habitable Planet, Annenberg Foundation 2015. URL: http://www.learner.org/courses/envsci/unit/pdfs/textbook.pdf*.

18CSA103 COMPUTER ESSENTIALS 3 0 2 4

Course outcomes

CO1	Introduction to computers, classification of computers, anatomy of computer, constituents and architecture, microcontrollers.
CO2	operating systems, functions of o/s, classification of operating systems, kernel, shell, basics of unix, shell programming, booting
CO3	databases, why databases are used, users, sql, datatypes in sql, introduction of queries - select, alter, udate, delete, truncate, using where, and or in not in
CO4	internet basics, features, applications, services, internet service providers, domain name system, browsing, email, searching
CO5	web programming basics, introduction of html and css programming
CO6	Introduction fo computers, classification of computers, anatomy of computer, constituents and architecture, microcontrollers.

Unit-1

Introduction to computers: Characteristics of computers, Classification of Digital Computer Systems: Microcomputers, Minicomputers, Mainframes, Supercomputers. Anatomy of Computer: Introduction, Functions & Components of a Computer, Central Processing Unit, Microprocessor, Storage units, Input and output Devices. How CPU and memory works. Program execution with illustrative examples. Introduction to microcontrollers.

Lab Component- PC Assembly,

Unit-2

Operating System Fundamentals

Operating Systems: Introduction, Functions of an operating System, Classification of Operating Systems, System programs, Application programs, Utilities,The Unix Operating System, Basic Unix commands, Microkernel Based Operating System, Booting,

Lab Component- OS installation, Basic Unix commands

Unit-3

Introduction to Database Management Systems

Database, DBMS, Why Database -File system vs DBMS, Database applications, Database users, Introduction to SQL, Data types, Classification of SQL-DDL with constraints, DML, DCL, TCL

Lab Component

Create: Table and column level constraints- Primary key, Foreign key, Null/ Not null, Unique, Default. Check, Alter, Drop, Insert, Update, Delete, Truncate, Select: using WHERE, AND, OR, IN, NOT IN

Unit-4

Internet Basics

Introduction, Features of Internet, Internet application, Services of Internet, Logical and physical addresses, Internet Service Providers, Domain Name System.

Lab Component: Web Browsing, Emails, Searching

Unit-5

Web Basics

Introduction to web,web browsers, http/https, URL, HTML5,CSS

Lab Component -HTML5 & CSS

TextBook

J. Glenn Brookshear,"Computer Science: An Overview", Addision-Wesley, Twelfth Edition, 2014

18CSA101 COMPUTATIONAL THINKING AND PROBLEM SOLVING 3 0 0 3

Course outcomes

CO1	Understand the basic concepts of NUmber System like binary, decimal, octal, Hexa-decimal including coversions, Boolean expresions etc
CO2	Understand the basic concepts of computational thinking, including sequential logic, abstractions, problem-solving and some basic algorithms like divide and conquer, greedy method etc
CO3	Possess the ability to design and develop programs to solve basic computational problems, develop algorithms and flowcharts
CO4	Possess the ability to extend their knowledge towards learning programming concepts like arrays, recurion & factorization etc
CO5	To get the idea of various searching and sorting techniques, text and pattern matching techniques
CO6	Understand the basic concepts of NUmber System like binary, decimal, octal, Hexa-decimal including coversions, Boolean expresions etc

Unit 1

Basics

Introduction, Information and data, Number Systems-Binary, Hexadecimal, Octal, Conversion, BCD, Data encoding. Boolean Algebra, Simplification of Boolean expression.

Unit 2

Problem Solving

Problem definition, Problem decomposition, Abstraction, Greedy Method, Divide and Conquer.

Unit-3

Algorithmic Thinking

Algorithm and Flowcharting, Name binding, Selection, Repetition.

Unit 4

Data organization: List and Arrays, Modularization, Problem Solving: Factoring and Recursion Techniques,

Unit-5

Searching and Sorting Techniques, Text processing and Pattern matching.

TEXT BOOKS:

1. David Riley and Kenny Hunt , Computational thinking for modern solver, Chapman & Hall/CRC, 2014
2. R.G. Dromey , "How to solve it by Computer", PHI, 2008

18CSA182 COMPUTATIONAL THINKING AND PROBLEM SOLVING LAB 0 0 2 1

Course outcomes

CO1	Understand the various conditional structures, Logical operations using Excel
CO2	Understand the working of various excel functions that operate on numeric, text, date data types
CO3	Develop flowcharts using flowgarithms
CO4	Implement the concept of arrays and recursion using flowgarithms
CO5	implement various searching and sorting techniques, text and pattern matching techniques using flowgarithms
CO6	Understand the various conditional structures, Logical operations using Excel

Unit-1 Excel

Unit-2 Excel

Unit3-Flowgarithm

Unit-4-Scratch

SEMESTER II

18CUL111 CULTURAL EDUCATION II 2 0 0 2

Course Objective:

To give students an idea on India's rich cultural, spiritual & academic progress

Course outcomes

CO1	idea of India's rich heritage
CO2	basic knowledge of elements for this universe
CO3	brief understanding of Bhagavadgita
CO4	inculcation of discipline & selflessness
CO5	brief idea of classification of Vedas

Bhagavad Gita and Life Management
Historicity of Ramayana and Mahabharata
Overview of Patanjali's Yoga Sutras
Highlights of Indian Mythology
Indian Society: Its Strengths and Weaknesses
Role & Position of Women in Indian Society
Indian Models of Economy, Business and Management
Health and Lifestyle related issues
Conservation of cultural heritage
Life and work of Great Seers of India (2)

TEXTBOOKS:

1. *The Glory of India (in- house publication)*
2. *Sanatana Dharma (A Compilation of Amma's teachings on Indian Culture)*

18ENG121 Professional Communication 1- 0-2-2

Objectives:

To convey and document information in a formal environment; to acquire the skill of self projection in professional circles; to inculcate critical and analytical thinking.

Course outcomes

CO1	Develop Speaking skills
CO2	Develop pattern of communication as required for different professional context
CO3	Use language with lots nuances and paying attention to tone and diction
CO4	Develop analytical & argumentative writing
CO5	Acquire upper Intermediate level vocabulary
CO6	Acquire critical and analytical thinking ability

Unit I

Vocabulary Building: Prefixes and Suffixes; One word substitutes, Modal auxiliaries,Error Analysis: Position of Adverbs, Redundancy, misplaced modifiers**,**Dangling modifiers – Reported Speech

Unit II

Instruction, Suggestion & Recommendation - Sounds of English: Stress, Intonation

- Essay writing: Analytical and Argumentative

Unit III

Circulars, Memos – Business Letters - e - mails

Unit IV

Reports: Trip report, incident report, event report - Situational Dialogue - Group Discussion

Unit V

Listening and Reading Practice - Book Review

References

1. *FelixaEskey. Tech Talk, University of Michigan. 2005*
2. *Michael Swan. Practical English Usage, Oxford University Press. 2005*
3. *Anderson, Paul. Technical Communication: A Reader Centered Approach, V Edition, Hercourt, 2003.*
4. *Raymond V. Lesikar and Marie E. Flatley. Basic Business Communication, Tata Mc Graw Hill Pub. Co. New Delhi. 2005. Tenth Edition.*
5. *Thampi, G. Balamohan. Meeting the World: Writings on Contemporary Issues. Pearson, 2013.*
6. *Lynch, Tony. Study Listening. New Delhi: CUP, 2008.*
7. *Kenneth, Anderson, Tony Lynch, Joan Mac Lean. Study Speaking. New Delhi: CUP, 2008.*
8. *Marks, Jonathan. English Pronunciation in Use. New Delhi: CUP, 2007.*
9. *Syamala, V. Effective English Communication For You (Functional Grammar, Oral and Written Communication): Emerald, 2002.*

18MAT112DISCRETE MATHEMATICS 3 1 0 4

Course outcomes

CO1	To understand the basic concepts of Mathematical reasoning, set and functions.
CO2	To understand various counting techniques and principle of inclusion and exclusions.
CO3	Understand the concepts of various types of relations, partial ordering and equivalence relations.
CO4	Apply the concepts of generating functions to solve the recurrence relations.
CO5	Familiarise the fundamental concepts of graph theory and shortest path algorithm.

Unit 1

Binary operations, group, semi group,monoid, abelian group, subgroup(simple theorems without proof)

Boolean algebra-definition-principle of duality-theorems.

Unit 2

Basic Counting Principles, Generating Functions, Euler's phi-function and its Application to Cryptography.

Unit 3

Relations and their properties - relation matrix, graph of a relation - types of relations -equivalence relation - n-ary relations

Unit 4

Advanced Counting Techniques: Recurrence Relations, Solving Linear Recurrence relations, Divide and Conquer Algorithms and Recurrence relations, Generating Functions, Inclusion Exclusionprinciplesand their Applications.

Unit 5

Introduction to Graph Theory: Graphs, Bipartite Graphs, Eulerian and Hamiltonian Graphs, Graph Connectivity.

TEXTBOOK:

Kenneth H. Rosen, Discrete Mathematics and its Applications, McGraw Hill.

REFERENCES

1. R. P. Grimaldi, "Discrete and Combinatorial Mathematics", Pearson Education, Fifth Edition, 2007.

2. Thomas Koshy, "Discrete Mathematics with Applications", Academic Press, 2005.

18CSA114 DATABASE MANAGEMENT SYSTEM 3 1 0 4

Course outcomes

CO1	Master the basic concepts of DBMS like data independence and three schema architecture.
CO2	Be familiar with the CODD's rules and E-R Model and also have clear picture about the structure of the relational databases.
CO3	Master the concept of normalization and different types of normalization.
CO4	Be familiar with the basics of query evaluation techiniques and query optimization and also to get a clear picture about transaction processing.
CO5	Master the basics of SQL and construct queries using SQL and also write programs using PL/SQL.

UNIT 1

Introduction - Data Independence - The Three Levels Of Architecture - The External Level - Conceptual Level

- Internal Level - Client/Server Architecture- System Structure , Instance and schema, Data Models, Types of DBMS

UNIT 2

Keys - CODD's Rules, Design Issues -ER – Model –Attribute types- Weak Entity Sets - Extended ER Features – ER to Relational Mapping, Structure Of Relational Databases

UNIT 3

Normalization –Anomalies- Functional Dependency: Armstrong's axioms- closure of a relation and closure of attribute– Lossless decomposition-1NF, 2NF, 3NF, Boyce - Codd Normal Form

UNIT 4

The Relational Algebra -- Query Processing and Optimization: Evaluation of Relational algebra expressions-Query Equivalence-Transaction Processing: ACID properties, states of a transaction-Introduction to concurrency control-Deadlock-Recovery.

UNIT 5

Built in SQL functions- Set operations, Sub Queries-Joins-DCL – TCL- Views – Sequences – Index – Locks

PL/SQL Basics – Exceptions – Cursors - Stored Functions – Triggers

TEXTBOOKS:

1. Silberschatz. Korth. Sudarshan: Database System Concepts - 6thEdition Mcgraw-Hill International Edition
2. Ivan Bayross: Sql- PL/SQL The Programming Language Of Oracle- 4rd Edition- Bpb Publications

REFERENCE:

1. C.J. Date: An Introduction To Database Systems - Eighth Edition - Pearson Education Asia
2. Kevin Loney - George Koch: Oracle 9i The Complete Reference Mcgraw-Hill International Edition
3. "Fundamentals of Database Systems" by Elmasri and Navathe

18CSA113 PROGRAMMING IN C 3 1 0 4

Course outcomes

CO1	Be familiar with the C Programming language which includes the structure of a C program, Tokens, Expressions, Operators etc.

CO2	Develop conditional and iterative statements to write C programs.
CO3	Inscribe C programs that uses pointers to access arrays and strings.
CO4	Exercise user defined functions to solve real time problems.
CO5	Be familiar with the user defined data type including structures and unions and also access files in C.

Unit1

Introduction to C language - structure of 'C' program, Programming elements(tokens) –Classes of data types –Declaration of variables, assigning values to variables, defining symbolic constants, escape sequences (backslash character constants), Operators–operator precedence and associativity, Expressions – Evaluation of expressions, type conversions(type casting).

Unit 2

Input and Output operations – formatted and unformatted input and output–Conversion specifiers-Conditional and Control structures

Unit 3

Arrays – single dimensional arrays - declaration –memory representation– initialization and access. 2D arrays and multidimensional arrays.

Strings – defining strings, initializing, accessing, character handling functions, arithmetic operations on characters, character by character input and output, string handling functions, array of strings and its features.

Pointers –Introduction, declaring and initializing pointer variables, pointer expressions, pointers and arrays, pointers and strings, array of pointers.

Unit 4

Functions – definition-declaration-prototypes and function call- actual and formal arguments-types of functions- call by value-call by reference-nesting of functions-recursive functions-pointers to functions-storage class specifiers.

Enumerated data types- Preprocessor directives – Macros - File inclusion, Command line arguments.

Unit 5

Structures – definition-declaration-initialization-accessing structures- array of structures, array within structures, structures within structures, self-referential structures, pointers to structures, uses of structures.

Union- definition- union of structures.

Files – Reading and writing files - file handling functions – file opening modes – file operations

TEXTBOOKS:

1. "Let us C", YashavantKanetkar, 13th Edition, BPB Publications.
2. "Programming in ANSI C", E. Balagurusamy, Sixth Edition, Tata McGraw-Hill Publishing Company Limited.

REFERENCES:

1. "Test your C skills", YashavantKanetkar,
2. "Exploring C", YashavantKanetkar,

18CSA111 COMPUTER ORGANIZATION 3 1 0 4

Course outcomes

CO1	Understand the general concepts in digital logic design, including logic elements, and their use in combinational and sequential logic circuit design.
CO2	Be familiar with the functional units of the processor such as the register file and arithmetic-logical unit
CO3	Be familiar with the representation of data, addressing modes, instructions sets
CO4	Understand ways to take advantage of instruction level parallelism for high performance processor design
CO5	Categorize memory organization and explain the function of each element of a memory hierarchy

Unit1

SOP and POS Expressions, Karnaugh Map Simplification - Universal gates, Sequential circuits and combinational circuits, Flip Flops, Registers, Counters, Decoder, Encoder, Multiplexer, De-multiplexer, Arithmetic circuits,

Unit 2

Computer Organization and Design - Instruction Codes- Computer Registers- Computer Instructions - Instruction Cycle - Memory Reference Instructions - Input Output configuration

Unit 3

Central Processing Unit: Introduction- General Register Organization - Stack Organization - Instruction Formats - Addressing Modes - Data Transfer and Manipulation - Conditional Branch Instructions - Program Interrupts

Unit 4

Pipeline and Vector Processing

Parallel Processing - Pipelining - Arithmetic Pipeline - Instruction Pipeline - Vector Processing - Array Processors

Unit 5

Memory Organization

Memory Hierarchy - Types of Memory - Main Memory - Auxiliary Memory - Associative Memory - Cache Memory

Computer Arithmetic – Introduction - Multiplication Algorithm - Booth's Algorithm.

TEXTBOOKS:

1. M Morris Mano - Computer System Architecture - PHI - Third Edition
2. Gideon Langholz, Abraha& Joe L Mott - Digital Logic Design - World Scientific Publishing Co Ltd

REFRENCES:

1. P Pal Chaudhuri - Computer Organization and Design - PHI - Second Edition
2. Thomas C Bartee - Digital Computer Fundamentals - Tata Mc Graw Hill - Sixth Edition
3. Carl V Hamcher - Computer Organization 5th Edition – Mc Graw Hill

18CSA183 DATABASE MANAGEMENT SYSTEM LAB 0 0 2 1

Course outcomes

CO1	Design and implement a database schema for a given problem domain.
CO2	Populate and query a database using SQL DDL and DML commands.
CO3	Be familiar with creating various database objects like view,sequence, synonym, index etc.
CO4	Inscribe PL/SQL programs using exception handling and cursors.
CO5	Exercise creatiing stored procedures, functions and database triggers.

Built in SQL functions- Set operations, Sub Queries-Joins-DCL – TCL- Views – Sequences – Index – Locks

PL/SQL – Exceptions – Cursors - Stored Functions – Triggers

18CSA184 PROGRAMMING IN C LAB 0 0 2 1

Course outcomes

CO1	Develop C programs that uses conditional and iterative statements.
CO2	Inscribe C programs that handles various types of arrays and strings.
CO3	Develop C programs that used pointers to access arrays.
CO4	Create user defined functions to solve the real time problems.
CO5	Develop C programs to execute file handling and to create user defined data types in C,

Operators- Arithmetic, Relational, Ternary, Logical, Bitwise
Control Statements-if, if-else, nested if, if-else if, switch, goto
Looping Control-while, for, do-while
Arrays-one-dimensional- creating, displaying merging, searching, sorting, reversing
Arrays-Two-dimensional- creating, displaying, Operations on 2D arrays
Strings-String functions, manipulation of strings, multi strings
Pointers – Pointer arithmetic, Array of pointers, pointer to array
Functions – passing arguments, returning values, recursive functions, pointers as arguments
Structures-Initializing, members as array, variables as array, passing structures to functions, pointers to structures
Union-Enum types, preprocessors-macros, macro with arguments, nested macro, file inclusion, command line arguments
File Handling

SEMESTER III

18AVP201/AMRITA VALUES PROGRAMME I /1 0 0 1
18AVP211 AMRITA VALUES PROGRAMME II 1 0 0 1

Amrita University's Amrita Values Programme (AVP) is a new initiative to give exposure to students about richness and beauty of Indian way of life. India is a country where history, culture, art, aesthetics, cuisine and nature exhibit more diversity than nearly anywhere else in the world.

Amrita Values Programmes emphasize on making students familiar with the rich tapestry of Indian life, culture, arts, science and heritage which has historically drawn people from all over the world.

Students shall have to register for any two of the following courses, one each in the third and the fourth semesters, which may be offered by the respective school during the concerned semester.

Course outcomes

CO1	Understand various attributes which make a person complete
CO2	Pay obedience to elders
CO3	Respect women
CO4	Valuing good even in enemies.

Insights into Indian Classical Music

The course introduces the students into the various terminologies used in Indian musicology and their explanations, like Nadam, Sruti, Svaram – svara nomenclature, Stayi, Graha, Nyasa, Amsa, Thala,- Saptatalas and their angas, Shadangas, Vadi, Samavadi, Anuvadi. The course takes the students through Carnatic as well as Hindustani classical styles.

Insights into Traditional Indian Painting

The course introduces traditional Indian paintings in the light of ancient Indian wisdom in the fields of aesthetics, the Shadanga (Sixs limbs of Indian paintings) and the contextual stories from ancient texts from where the paintings originated. The course introduces the painting styles such as Madhubani, Kerala Mural, Pahari, Cheriyal, Rajput, Tanjore etc.

Insights into Indian Classical Dance

The course takes the students through the ancient Indian text on aesthetics the Natyasastra and its commentary the AbhinavaBharati. The course introduces various styles of Indian classical dance such as Bharatanatyan, Mohiniyatton, Kuchipudi, Odissy, Katak etc. The course takes the students through both contextual theory as well as practice time.

Indian Martial Arts and Self Defense

The course introduces the students to the ancient Indian system of self-defense and the combat through various martial art forms and focuses more on traditional Kerala's traditional KalariPayattu. The course introduces the various exercise technique to make the body supple and flexible before going into the steps and techniques of the martial art. The advanced level of this course introduces the technique of weaponry.

Social Awareness Campaign

The course introduces the students into the concept of public social awareness and how to transmit the messages of social awareness through various media, both traditional and modern. The course goes through the theoretical aspects of campaign planning and execution.

Temple Mural Arts in Kerala

The traditional percussion ensembles in the Temples of Kerala have enthralled millions over the years. The splendor of our temples makes art enthusiast spellbound, warmth and grandeur of color combination sumptuousness of the outline, crowding of space by divine or heroic figures often with in vigorous movement are the characteristics of murals.

The mural painting specially area visual counterpart of myth, legend, gods, dirties, and demons of the theatrical world, Identical myths are popular the birth of Rama, the story of Bhīma and Hanuman, Shiva, as Kirata, and the Jealousy of Uma and ganga the mural painting in Kerala appear to be closely related to, and influenced by this theatrical activity the art historians on temple planes, wood carving and painting the architectural plane of the Kerala temples are built largely on the pan-Indians almost universal model of the vasthupurusha.

Organic Farming in Practice

Organic agriculture is the application of a set of cultural, biological, and mechanical practices that support the cycling of farm resources, promote ecological balance, and conserve biodiversity. These include maintaining and enhancing soil and water quality; conserving wetlands, woodlands, and wildlife; and avoiding use of synthetic fertilizers, sewage sludge, irradiation, and genetic engineering. This factsheet provides an overview of some common farming practices that ensure organic integrity and operation sustainability.

Ayurveda for Lifestyle Modification:

Ayurveda aims to integrate and balance the body, mind, and spirit which will ultimately leads to human happiness and health. Ayurveda offers methods for finding out early stages of diseases that are still undetectable by modern medical investigation. Ayurveda understands that health is a reflection of when a person is living in harmony with nature and disease arises when a person is out of harmony with the cycles of nature. All things in the universe (both living and non-living) are joined together in Ayurveda. This leaflet endow with some practical knowledge to rediscover our pre- industrial herbal heritage.

Life Style and Therapy using Yoga

Yoga therapy is the adaptation of yogic principles, methods, and techniques to specific human ailments. In its ideal application, Yoga therapy is preventive in nature, as is Yoga itself, but it is also restorative in many instances, palliative in others, and curative in many others. The therapeutic effect comes to force when we practice daily and the body starts removing toxins and the rest is done by nature.

Course Objective

To build soft skills and an awareness for its importance.

Course outcomes

CO1	Smooth transition from an academic environment to work environment;
CO2	Adapt to their new workplace
CO3	Learn to cope with fear, stress and competition in professional world
CO4	Develop positive attitude, self-motivating ability and willingness for continuous knowledge up gradation

Soft skills and its importance: Pleasure and pains of transition from an academic environment to work-environment. Need for change. Fears, stress and competition in the professional world. Importance of positive attitude, self-motivation and continuous knowledge upgradation.

Self Confidence: Characteristics of the person perceived, characteristics of the situation, Characteristics of the Perceiver. Attitude, Values, Motivation, Emotion Management, Steps to like yourself, Positive Mental Attitude, Assertiveness.

Presentations: Preparations, Outlining, Hints for efficient practice, Last minute tasks, means of effective presentation, language, Gestures, Posture, Facial expressions, Professional attire.

Vocabulary building: A brief introduction into the methods and practices of learning vocabulary. Learning how to face questions on antonyms, synonyms, spelling error, analogy etc. Faulty comparison, wrong form of words and confused words like understanding the nuances of spelling changes and wrong use of words.

Listening Skills: The importance of listening in communication and how to listen actively.

Prepositions and Articles: A experiential method of learning the uses of articles and prepositions in sentences is provided.

Problem solving; Number System; LCM &HCF; Divisibility Test; Surds and Indices; Logarithms; Ratio, Proportions and Variations; Partnership; Time speed and distance; work time problems;

Data Interpretation: Numerical Data Tables; Line Graphs; Bar Charts and Pie charts; Caselet Forms; Mix Diagrams; Geometrical Diagrams and other forms of Data Representation.

Logical Reasoning: Family Tree; Linear Arrangements; Circular and Complex Arrangement; Conditionalities and Grouping; Sequencing and Scheduling; Selections; Networks; Codes; Cubes; Venn Diagram in Logical Reasoning.

TEXTBOOKS:

1. *A Communicative Grammar of English: Geoffrey Leech and Jan Svartvik. Longman, London.*
2. *Adair J (1986) - "Effective Team Building: How to make a winning team", London, U.K: Pan Books.*
3. *Gulati S (2006) - "Corporate Soft Skills", New Delhi, India: Rupa& Co.*
4. *The Hard Truth about Soft Skills, by Amazone Publication.*

REFERENCES:

1. *Quantitative Aptitude, by R S Aggarwal, S Chand Publ.*
2. *Verbal and Non-verbal Reasoning, R S Aggarwal, S Chand Publ.*
3. *Data Interpretation, R S Aggarwal, S Chand Publ.*
4. *Nova GRE, KAPAL GRE, Barrons GRE books;*
5. *Quantitative Aptitude, The Institute of Chartered Accountants of India.*
6. *More Games Teams Play, by Leslie Bendaly, McGraw-Hill Ryerson.*
7. *The BBC and British Council online resources*
8. *Owl Purdue University online teaching resources*
9. *www.thegrammarbook.com online teaching resources*
10. *www.englishpage.com online teaching resources and other useful websites.*

18MAT208 STATISTICAL AND NUMERICAL METHODS 3 1 0 4

Course outcomes

CO1	Study the relationship of a dependent variable on an independent variable.
CO2	Understand the various types of probability distributions and its applications
CO3	To understand the meaning and process of differentiation
CO4	Provide numerical answers to complex problems of scientific and engineering nature.
CO5	Develop an idea of numbers,its divisibility and properties

Unit 1

Statistics-Introduction -Measures of average-AM-Median-Mode, Measures of dispersion and its coefficients – Range – QD – SD-MD

Unit 2

Correlation- Karl Pearson's and Spearman's rank correlation, Regression- regression equations, regression coefficients

Unit 3

Permutations – combinations – Probability-addition theorem, multiplication theorem, independent events,conditionalprobability,Baye'stheorem,Probability distribution-Binomial,Poisson, Normal.

Unit 4

Interpolation- Newton's forward &backward method- Lagrange's Method,Curvefitting-fitting a straight line

Unit 5

Solutions of Numerical, Algebraic and transcendental methods- bisection method, Newton Raphsonmethod,Simultaneous linear equations -Gauss elimination

TEXT BOOKS:

P.R.Vittal-Business Mathematics and Statistics,MarghamPublications,Chennai,

REFERENCE:

1. H.S.Hall and S.R.Knight: Higher Algebra –AITBS Publishers India.

2. M.K.Venkataraman: Numerical methods in Science and Engineering-National Publishing Company,Chennai

18CSA209 DATA STRUCTURES AND ALGORITHMS 3 1 0 4

OBJECTIVES: This course is intended to introduce abstract concepts and shows how those concepts are useful in problem solving, and then shows how the abstractions can be made concrete by using a programming language. Equal emphasis is placed on both the abstract and the concrete versions of a concept. The only prerequisite for students is an understanding in programming.

Course outcomes

CO1	Student will be able to understand the memory organization and use of various data structures
CO2	Learn the working of various searching and sorting algorithms
CO3	Able to develop applications using suitable data structures
CO4	Understand the tree and tree traversal concepts
CO5	Gives an idea about graphs and finding shortest path

Unit 1. Algorithm Analysis

Basic mathematical review, RAM model of computation, Pseudocode conventions, Worst case, Average case and Best case analysis, Asymptotic Analysis, Back Substitution Method, masters method, Euclid's algorithm, Exponentiation.

Unit 2: Searching and Sorting

Linear Search, Binary Search – Analysis, Bubble Sort, Insertion Sort, Merge sort, Quick Sort

Unit 3. Linear Data Structures

Abstract Data Type, List ADT: Singly linked lists, Doubly linked lists, Circular Linked Lists, Stack ADT implementation and applications, Queue ADT: Implementation and Application. Circular Queue, Priority Queue

Unit 4. Non-Linear Data Structures.

Basic concepts of trees, Implementation of trees, Traversal, Binary tree, Expression tree, Binary search tree, AVL tree, Heap

Unit 5. Graphs

Adjacency matrix, Adjacency list, bfs, dfs, MST Prims and Kruskals, Dijkstras algorithm

Text Book: Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", Second Edition, Pearson Education

References: 1. Samanta, Debasis. Classic data structures. PHI Learning Pvt. Ltd., 2004.

2. Cormen, Thomas H. Introduction to algorithms. MIT press, 2009.

18CSA206 OBJECT ORIENTED PROGRAMMING USING C++ 3 1 0 4

Course outcomes

CO1	Provides basic concepts of OOPS
CO2	Learn to use programming constructs in C++
CO3	Understand how abstraction is implemented using C++
CO4	Demonstrate the pinter concepts
CO5	Able to develop applications using templates and files

UNIT 1

Introduction to C++, Object Oriented Concepts, Basics of C++ environment, Classes & Object, Data members, Access specifiers, Defining member functions, inline member functions, nesting of member functions, Array within a class, Static data members, Constant members , Arrays of objects, Objects as arguments, Returning objects, Constructors, Default Constructors, Parameterized constructors, Copy constructors, Destructors, friend functions, friend classes.

UNIT 2

Compile time polymorphism, function overloading, Overloading operators, Overloading unary, Overloading binary, Overloading using friends, Overloading constructor Manipulation of strings using operators, overloading constructors, Inheritance, Base classes and derived classes, Protected members, Types, constructors in base derived classes,

UNIT 3

Run time Polymorphism, function overriding, virtual base class, Virtual functions, pure virtual function, Abstract classes, class containership. Exception handling- basics of exception handling, exception handling mechanism, throw , catch, rethrow exceptions.

UNIT 4

Fundamentals of pointers, New, Delete operators, pointer declarations, operations on pointers, passing pointers to function, passing an entire array to a function, pointers and two-dimensional arrays, array of

pointers, passing functions to other functions, pointers to structures, this pointer.

UNIT 5

class templates, class templates with multiple parameters, function templates, function templates with multiple parameters, Data files -C++ stream classes, unformatted and formatted I/O operations, Opening and closing of files, File modes, File pointers and manipulation, Sequential input and output operations , Updating a file, Error handling during file operations.

TEXT / REFERENCES:

1. E. Balagurusamy "Object-Oriented Programming With C++", Fifth Edition, Tata Mcgraw-Hill Publishing Company Ltd

2. H.M. Deitel and P.E. Deital,"C++ How to Program", Eighth Edition Prentice Hall of India,1998.

18CSA201 OPERATING SYSTEM 3 1 0 4

Objectives: Fundamental concepts and designs will be covered along with the practical aspects that pertain to the most popular operating systems such as Unix/Linux and Windows, and some instructional operating systems will be studied as well.

Course outcomes

CO1	Understand the basic concepts of OS with different types of OS, different services along with the various system calls
CO2	Get the knowledge of process management, various operations on process and Inter process communication
CO3	Understand the various process scheduling algorithms
CO4	Learn about deadlocks, methods of handling deadlocks, preventing deadlocks etc
CO5	Get a knowledge of memory management -paging and segmentation etc

UNIT 1

Introduction to Operating Systems: Mainframe systems-Desktop systems-Multiprocessor systems-

Distributed systems-Clustered systems-Real-time systems-Handheld systems

Operating System Structures: System components-Operating System services-System calls-System Programs-

System Structures-System Design and Implementation-System Generation.

UNIT 2

Process Management: Process Concept-Process Scheduling-Operations on processes-Cooperating processes-Inter Process Communication

CPU Scheduling: Basic concepts-Scheduling criteria-Scheduling Algorithms-First Come Firstserved Scheduling, Shortest job First Scheduling, Round Robin Scheduling, Multilevel Queue Scheduling, Multilevel Feedback Queue Scheduling.

Process synchronisation:Background,critical section problem, semaphores, monitors,producer consumer problem, dining philosophers problem, readers and writers problem.

UNIT 3

Deadlocks: System Model-Deadlock Characterization-Methods for handling Deadlocks-Deadlock Prevention-Deadlock Avoidance-Deadlock detection-Recovery from deadlock.

UNIT 4

Memory Management: Background-Swapping-Contiguous Memory allocation-Paging-Segmentation-Segmentation with Paging. Virtual Memory: Background-Demand paging-Process creation-Page replacement-Allocation of Frames-Thrashing.

UNIT 5

I/O Systems: Overview, I/O Hardware

Mass storage structure- Disk structure, disk scheduling, disk management.

Case Study:- Unix System

TEXT BOOK:

Abraham SilberSchartz- peter B Galvin-Greg Gagne, Operating system Concepts. Eighth Edition, Addison-Wesley(2003)

REFERENCES:

1. S.Godbole - Operating Systems - Tata McGraw Hill Publications
2. H.M Deitel - Operating Systems - Second Edition - Pearson Edition Asia

18CSA207 PRINCIPLES OF MANAGEMENT AND ACCOUNTING 3 0 0 3

OBJECTIVES: *The objective of this course to enable the students to have a basic knowledge of principles of management and to provide theoretical and practical aspects of various systems of accounting.*

Course outcomes

CO1	Observe and evaluate the influence of historical forces on the current practice of management.

CO2	Explain how organizations adapt to an uncertain environment and identify techniques managers use to influence and control the internal environment.
CO3	Practice the process of management's four functions: planning, organizing, leading, and controlling.
CO4	Identify and properly use vocabularies within the field of management to articulate one's own position on a specific management issue and communicate effectively with varied audiences.
CO5	Evaluate leadership styles to anticipate the consequences of each leadership style.

Unit 1

Management: meaning and definition, importance of management, administration and management, functional management, functions of management, levels of management

Unit 2

Financial Accounting: Meaning and important terms, accounting concepts, double entry book keeping, types of accounts, journal, ledger, trial balance.

Unit 3

Final Accounts: Preparation of Trading and Profit and Loss Accounts and Balance Sheet, adjustments relating to outstanding expenses, prepaid expenses, accrued income unearned income, depreciation and bad and doubtful debts.

Unit 4

Financial Statement Analysis, Trend Analysis

Unit 5

Cost Accounting: Meaning and Definition, difference between cost accounting and financial accounting, elements of cost, Cost sheet, Expenses excluded from cost.

Reference Books:

1. DinkarPagare – Principles of Management, Sultan Chand and Sons
2. Vineeth, Shabu – Principles of Management and Accounting, Kalyani Publishers
3. S.P. Jain, K.L. Narang – Financial Accounting, Kalyani Publishers
4. S.P. Jain, K.L. Narang – Cost Accounting, Kalyani Publishers

18CSA283 DATA STRUCTURES AND ALGORITHMS LAB 0 0 2 1

Course outcomes

CO1	Student will be able to implement various sorting algorithms
CO2	Learn to apply array, stack and queue concepts to solve real world problems
CO3	Able to use the concepts of link list to solve various problems
CO4	Learn to implement the trees and binary search trees
CO5	Understand tree traversal algorithms

Topic 1: ***Sorting – Searching***

1. Write a program to implement Bubble Sort.
2. Write a program to implement selection sort.
3. Write a program to implement Quick Sort.
4. Write a program to implement Insertion Sort.
5. Write a program to implement Merge Sort.
6. Write a program to implement Binary Search.

Topic 2: ***Arrays –Stacks-Recursion***

7. Write and test a function that transposes a square matrix.
8. Write and test a recursive function that prints all the permutations of the first n characters of a string.
9. Write and test a recursive function that returns the power x^n
10. Write a program to implement a stack of strings (illustrate the operations push (), pop(), size(), empty() and top()).
11. Write a program to show the linked implementation of the ***Stack*** class.
12. Write a program to covert infix to postfix.
13. Write a program to implement Towers of Hanoi using Stack.

Queues-Linked-Lists

14. Write a program to implement a linear list and perform the operation such as insert(), search() and delete().
15. Write a program to implement a queue by adding the functions such as
    (i) Determine the size
    (ii) input queue
    (iii) output a queue
    (iv) split a queue into two queues
16. Write a program to search a circular linked list with a header node.

Topic 3: ***Binary Trees - Binary Tree Traversal***

17. Write a program to implement Binary Search Tree.
18. Priority queue implementation.
19. Write a program to create a binary tree and find the height of a binary tree.
20. Write a program to perform the binary tree traversals.
21. Write a program to perform a deletion from a Binary Tree (using a delete () function).

Topic 4: ***Graphs***

20. Matrix representation of graphs
21. DFS traversal
22. BFS traversal

18CSA284 OBJECT ORIENTED PROGRAMMING USING C++ LAB 0 0 2 1

Course outcomes

CO1	Develop programs using OOPS concepts
CO2	Implement the concepts of pointers using c++
CO3	Able to develop application using files.
CO4	Familiarize the students with the concepts of templates
CO5	Learn to implement exception handling in C++

Class and objects- creating class, objects, private, public data members, member functions, object as array, arguments, returning objects
Constructors & destructors- Default Constructors, Parameterized constructors, Copy constructors, friend functions, friend classes.
Polymorphism- function overloading, operator overloading, overloading unary and binary

Pointers -operations on pointers, passing pointers to function, passing an entire array to a function, pointers and two-dimensional arrays, array of pointers, pointers to objects.

Inheritance, Single, multiple, hierarchical, multi-level, hybrid

Function overriding, virtual base class, Creation of pure virtual function

Using new and delete operator, pointer arithmetic

Data files - unformatted and formatted I/O operations, Opening and closing of files, File modes, File pointers and manipulation, Sequential input and output operations, Updating a file, Error handling

Templates - class templates, class templates with multiple parameters, function templates, function templates with multiple parameters

Exception handling- basics of exception handling, throw, catch, rethrow exceptions.

SEMESTER IV

18SSK211 LIFE SKILLS II 1 0 2 2

Course Objective
To groom the student for professional environment and making him aware of the corporate culture and basic business etiquette
Course outcomes

CO1	Knowledge of socially acceptable ways of behaviour
CO2	Knowledge of personal hygiene and attire
CO3	Development of cultural adaptability
CO4	Convert Passive vocabulary into active vocabulary
CO5	Solve problems in QA & logical reasoning

Professional Grooming and Practices: Basics of Corporate culture, Key pillars of Business Etiquette. Basics of Etiquette: Etiquette – Socially acceptable ways of behaviour, Personal hygiene, Professional attire, Cultural Adaptability. Introductions and Greetings: Rules of the handshake, Earning respect, Business manners. Telephone Etiquette: activities during the conversation, Conclude the call, To take a message. Body Language: Components, Undesirable body language, Desirable body language. Adapting to Corporate life: Dealing with people.

Group Discussions: Advantages of Group Discussions, Structured GD – Roles, Negative roles to be avoided, Personality traits to do well in a GD, Initiation techniques, How to perform in a group discussion, Summarization techniques.
Listening Comprehension advanced: Exercise on improving listening skills, Grammar basics: Topics like clauses, punctuation, capitalization, number agreement, pronouns, tenses etc.

Reading Comprehension advanced: A course on how to approach middle level reading comprehension passages.
Problem solving – Money Related problems; Mixtures; Symbol Based problems; Clocks and Calendars; Simple, Linear, Quadratic and Polynomial Equations; Special Equations; Inequalities; Functions and Graphs; Sequence and Series; Set Theory; Permutations and Combinations; Probability; Statistics.
Data Sufficiency: Concepts and Problem Solving.
Non-Verbal Reasoning and Simple Engineering Aptitude: Mirror Image; Water Image; Paper Folding; Paper Cutting; Grouping Of Figures; Figure Formation and Analysis; Completion of Incomplete Pattern; Figure Matrix; Miscellaneous.
Special Aptitude: Cloth, Leather, 2D and 3D Objects, Coin, Match Sticks, Stubs, Chalk, Chess Board, Land and geodesic problems etc., Related Problems

TEXTBOOKS:

1. *A Communicative Grammar of English: Geoffrey Leech and Jan Svartvik. Longman, London.*
2. *Adair J (1986) - "Effective Team Building: How to make a winning team", London, U.K: Pan Books.*
3. *Gulati S (2006) - "Corporate Soft Skills", New Delhi, India: Rupa& Co.*
4. *The Hard Truth about Soft Skills, by Amazone Publication.*

REFERENCES:

1. *Quantitative Aptitude, by R S Aggarwal, S Chand Publ.*
2. *Verbal and Non-verbal Reasoning, R S Aggarwal, S Chand Publ.*
3. *Quantitative Aptitude by AbjithGuha, Tata McGraw hill Publ.*
4. *More Games Teams Play, by Leslie Bendaly, McGraw-Hill Ryerson.*
5. *The BBC and British Council online resources*
6. *Owl Purdue University online teaching resources*
7. *www.thegrammarbook.com online teaching resources*
8. *www.englishpage.com online teaching resources and other useful websites.*

18CSA214 COMPUTER NETWORKS 3 1 0 4

Objectives: *This course presents an in-depth discussion of the most important networking protocols comprising the TCP/IP protocol suite. Students will be able to understand state of the art in network protocols, architectures, and applications.*

Course outcomes

CO1	Get aware about the architecture of network topology and need for reference

	model
CO2	Understand the error correction and detection methods used in DLL and goodness of frame structure
CO3	An awareness about routing, IP addresses and subnetting
CO4	Provides information regarding congestion control mechanism at transport layer
CO5	Provides deep knowledge about the working of HTTP and DNS at application layer

Unit 1

Evolution of Computer Networking-Types of Network- networks topologies-Protocols & standards-Network Devices-The OSI reference model- TCP/IP Reference Model.

Physical Layer: transmission media- Analog Transmission- Digital transmission

Unit 2

Data Link Layer Design Issues-Services provided to the Network Layer-Framing-Error Control-Flow Control-Error Detection and Correction- Elementary Data Link Protocols- Sliding Window Protocols- Multiple Access Protocols-An overview of IEEE Standard for LANs, MAC Address.

Unit 3

Introduction to Network Layer – Services - Circuit Switching Vs Packet Switching-Packet Switched Networks-Types of Routing-routing algorithms- congestion control algorithms-Network Protocols-IP- IPV4, IPV6, Subnets, Gateways- Congestion Avoidance in Network Layer.

Unit 4

The Transport Services – Services provided to the upper layers –Elements of transport Protocols –Internet Transport Protocols- Congestion Controls in Transport Layer

Unit 5

Principles of Network Applications-Web and HTTP-Electronic mail-DNS

TEXTBOOK

Computer Networks (Fifth Edition) – Andrew S. Tanenbaum (Prentice Hall of India)

REFERENCES:

1. Computer Networking A Top-Down Approach(Fifth Edition)-James F. Kurose-Keith W. Ross (Pearson)
2. Computer Networks - Protocols, Standards and Interfaces (Second Edition) – UylessBlack(Prentice Hall of India Pvt. Ltd.)
3. Data communication and Networking(Fourth Edition)- Behrouz A Forouzan(Tata Mcgraw Hill)

18CSA215 JAVA PROGRAMMING 3 1 0 4

Objectives: *The main objective of this course is to understand the basic concepts and techniques which form the object oriented programming paradigm using Java Language.*

Course outcomes

CO1	Understand the features of Java and the architecture of JVM
CO2	Write, compile, and execute Java programs that may include basic data types and control flow constructs and how type casting is done
CO3	Identify classes, objects, members of a class and relationships among them needed for a specific problem and demonstrate the concepts of polymorphism and inheritance
CO4	The students will be able to demonstrate programs based on interfaces and threads and explain the benefits of JAVA's Exceptional handling mechanism compared to other Programming Language
CO5	Write, compile, execute Java programs that include GUIs and event driven programming and also programs based on files

Unit 1

Introduction and Features of Java - Byte Code, Program Translation, JVM.

Unit 2

Program Structure, Data types, Java Statements, Type casting in Java programs - Types of Operators.

Unit 3

Decision Making statements, Looping statements-Arrays, Strings, Vectors, Wrapper classes - Class, methods, Inheritance, Visibility control, Final Classes, methods and Variables.

Unit 4

Interfaces - Interfaces in Java Library - Packages - System Packages, User defined packages – Multithreading - Threads, Runnable Interface, Thread Priorities - Exception Handling - try, catch, throw, throws, finally.

Unit 5

File handling and I/O in java - Stream Classes, Random access Files. Event handling - GUI Programming - AWT, Windows Fundamentals - Applets - Life cycle of an applet.

TEXTBOOK:

E Balagurusamy, Programming with Java – A Primer, Fourth Edition, Tata McGraw Hill Education Private Limited.

REFERENCE:

Java 2 - The Complete Reference – McGraw Hill publication.

18CSA216 WEB TECHNOLOGIES 3 1 0 4

Course outcomes

CO1	Students are able to develop a dynamic webpage by the use of java script and DHTML.
CO2	Students will be able to write a well formed / valid XML document.
CO3	Students will be able to connect a java program to a DBMS and perform insert, update and delete operations on DBMS table.
CO4	Students will be able to write a server side java application called JSP to catch form data sent from client and store it on database.
CO5	Students will be able to write a server side java application called Servlet to catch

	form data sent from client, process it and store it on database.

Unit -1

HTML5 and CSS3

HTML5- Basic Tags, Tables,Forms.HTML5 Tags,HTML Graphics, HTML media, HTML Graphics,HTML APIs.

CSS - Background, Borders,margin, Box model. Styling text, fonts,list,links,tables. CSS overflow,float,inline blocks, pseudoclasses,pseudoelements.CSS border images,rounded corners

Unit-2

Java Script

Client side scripting using java script, Introduction to java script, internal and external Java script files, variables, control statements, loops, Arrays , string handling , How to write functions in JavaScript, inputting and outputting from form elements to JavaScript. DOM concept, creating html elements using java script. Drawing 2D shapes, handling events. Introduction to AJAX

Unit-3

Building Single page applications with Angular JS

Single page application – introduction , two way data binding, MVC in angular JS, controllers, getting user inputs , loops , Client side routing – accessing URL data , various ways to provide data in angular JS.

Unit -4

Server Side Programming

Server side scripting, Difference between client side and server side scripting languages. Introduction to PHP, variables, control statements, loops, Arrays, string handling, PHP forms, Global variables in PHP, Regular expression and pattern matching, Database programming: inputting and outputting data from MySQL using PHP, insertion , deletion and updating data.

State management in web applications, cookies, Application and session state.

Unit-5

Introduction to Xml, usage of XML, XML tags, elements and attributes, attribute type, XML validation: DTD and XSD, XML DOM

Case study:-Application Development using Laravel framework

Textbook/Reference:

The Complete Reference, HTML and CSS by Thomas A Powell latest edition

XML Bible by Horold, Ellotte Rusty

Web Reference:- W3Schools.com

18CSA211 SOFTWARE ENGINEERING 3 0 2 4

Objectives: Software Engineering presents a broad perspective on software systems engineering, concentrating on widely used techniques for developing large-scale software systems. This course covers a wide spectrum of software processes from initial requirements elicitation through design and development to system evolution.

Course outcomes

CO1	Students get an idea on the software crisis, myths, basics of software engineering, its phases of development etc.
CO2	Students get an overall idea about SRS and differnt Process Models.
CO3	Students are provided with a good idea of ERD, DFD, Design Methods and architectural views
CO4	An overall idea about Testing startegies, differnt methods and Testability concept is provided to the students.
CO5	All maintainance concepts, types of changes, maintainance side effects are given to students along with the idea of software re-engineering.

Unit 1
Introduction – Software - Software Crisis - Software Myths – Process and Product - Software characteristics- SDLC Introduction
Unit 2
Software requirements specification – Approaches – Paradigms – Build and Fix - Waterfall – Prototyping – Spiral – Concurrent – RAD – Incremental – Agile Introduction.

Unit 3
Analysis Modelling - Elements of Analysis Model - Data Modelling - ERD – DFD - Data Dictionary. Introduction to Design concepts - Design Architecture, Design characteristics, Description, Principles. Object oriented diagrams - Class diagrams - Use Case Diagrams – State-transition diagrams – Object diagrams – Interaction diagrams – UML Modelling .
Unit 4
Software Testing Fundamentals - Objectives of Testing - Testing Principles – Testability -Testing Process and Methods – Introduction to Testing Strategies.
Unit 5
Software Maintenance - Reverse Engineering and Reengineering

TEXTBOOK:

Roger S. Pressman, "Software Engineering", Tata McGraw-Hill Publishing Company Pvt. Ltd, Sixth Edition.
REFERENCE:
Shooman, "Software Engineering", Tata McGraw-Hill Publishing Company, Pvt. Ltd, 1987

18CSA285 JAVA PROGRAMMING LAB 0 0 2 1

Course outcomes

CO1	Implement Object Oriented programming concept using basic syntaxes of control Structures
CO2	Identify classes, objects, members of a class and the relationships among them needed for a finding the solution to specific problem
CO3	Demonstrates how to achieve reusability using inheritance
CO4	Demonstrate understanding and use of interfaces, packages, different exception handling mechanisms and concept of multithreading for robust faster and efficient application development.
CO5	Identify and describe common user interface components to design GUI in Java using Applet & AWT along with response to events

Unit 1 Java Fundamentals

1. Write a program to print the following triangle of numbers

   1
   1 2
   1 2 3
   1 2 3 4
   1 2 3 4 5
2. Write a simple java application, to print the message , "Welcome to java"
3. Write a program to display the month of a year. Months of the year should be held in an array.
4. Write a program to assign two integer values to X and Y. Using the 'if' statement the output of the program should display a message whether X is greater than Y.
5. Write a program to find the area of rectangle.
6. Write a program to list the factorial of the numbers 1 to 10. To calculate the factorial value, use while loop. (Hint Fact of 4 = 4*3*2*1)

Unit 2 OOPs in Java

7. Write a java program to add two integers and two float numbers. When no arguments are supplied, give a default value to calculate the sum. Use function overloading.
8. Write a program to perform mathematical operations. Create a class called AddSub with methods to add and subtract. Create another class called MulDiv that extends from AddSub class to use the member data of the super class. MulDiv should have methods to multiply and divide A main function should access the methods and perform the mathematical operations.
9. Write a program with class variable that is available for all instances of a class .Use static variable declaration. Observe the changes that occur in the object's member variable values.
10. Write a java program
    a. To find the area and circumference of the circle by accepting the radius from the user.

b. To accept a number and find whether the number is Prime or not

11. Write a java program to create a Student class with following attributes
    Enrollment No:, Name, Mark of sub1, Mark of sub2, mark of sub3, Total Marks. Total of the three marks must be calculated only when the student passes in all three subjects. The pass mark for each subject is 50. If a candidate fails in any one of the subjects his total mark must be declared as zero. Using this condition write a constructor for this class. Write separate functions for accepting and displaying student details. In the main method create an array of three student objects and display the details.
12. In a college first year class are having the following attributes
    Name of the class (BCA, BCom, MHA), Name of the staff
    No of the students in the class, Array of students in the class
    Define a class called first year with above attributes and define a suitable constructor. Also write a method called best Student() which process a first year object and return the student with the highest total mark. In the main method define a first year object and find the best student of this class
13. Write a Java program to define a class called employee with the name and date of appointment. Create ten employee objects as an array and sort them as per their date of appointment. ie, print them as per their seniority.
14. Create a package 'student.fulltime .BCA' in your current working directory
    a. Create a default class student in the above package with the following attributes: Name, age, sex.
    b. Have methods for storing as well as displaying

Unit 3 Exception Handling

15. Write a program to demonstrate a division by zero exception
16. Write a program to create an user defined exception say Pay Out Of Bounds.
17. Write a small program to catch Negative Array Size Exception. This exception is caused when the array is initialized to negative values.
18. Write a program to handle Null Pointer Exception and use the "finally" method to display a message to the user.

Units 4 and 5 GUI Programming I and II

19. Write a program which create and displays a message on the window
20. Write a program to draw several shapes in the created window
21. Write a program to create an applet and draw grid lines
22. Write a Java program which creates a frame with two buttons father and mother. When we click the father button the name of the father, his age and designation must appear. When we click mother similar details of mother also appear.
23. Create a frame which displays your personal details with respect to a button click
24. Create a simple applet which reveals the personal information of yours.
25. Write a program to move different shapes according to the arrow key pressed.
26. Write a java Program to create a window when we press
    M or m the window displays Good Morning
    A or a the window displays Good After Noon
    E or e the window displays Good Evening
    N or n the window displays Good Night
27. Demonstrate the various mouse handling events using suitable example.
28. Write a program to create menu bar and pull down menus.

29. Write a program to explain the multithreading with the use of multiplication table. Three threads must be defined. Each one must create one multiplication table.
30. Write a program to illustrate thread priority.
31. Create a GUI program in java with the following components.
    a. A frame with flow layout.
    b. Add the following components on to the frame.
        i. Two Text Field ii. A button with the label display
    c. Allow the user to enter data into the textfield
    d. When the button is clicked paint the frame by displaying the data entered in the textfield
    e. Allow the user to properly close the frame

18CSA286 WEB TECHNOLOGIES LAB 0 0 2 1

Course outcomes

CO1	Design and implement dynamic websites with good aesthetic sense of designing and latest technical know-how's.
CO2	Have a Good grounding of Web Application Terminologies, Internet Tools, E – Commerce and other web services.
CO3	Learn to use cookies and session in PHP programs
CO4	Learn to imnplement Anjular JS services
CO5	Learn to use XML and DTD to store and retrieve data

1. Create a web page with advanced layouts and positioning with CSS and HTML.
2. Design a website with different methods of embedding CSS in a web page.
3. Create a static web page which displays your personal details. (Hint: CSS3 and HTML5)
4. Create a web page through which the user can enter his / her details to become an authenticated user of that page.
5. Create a web site for a Computer Hardware shop. (Hint: CSS3 and HTML5)
6. Create a web site for Amrita School of Arts and Sciences. (Hint: CSS3 and HTML5)
7. Create a web page that shows different methods of embedding JavaScript.
8. Create a web page with rollover menus. Rollover menus should be created using JavaScript.
9. Create a simple calculator, which can perform the basic arithmetic operations.
10. Validate the registration for with the following criteria:
    a. Name and Age should be Mandatory Fields.
    b. Password and Re-enter Password fields should contain same value.
    c. Name field should accept only character values.
11. Write a PHP program to store current date-time in a COOKIE and display the 'Last visited on' date-time on the web page upon reopening of the same page.
12. Write a PHP program to store page views count in SESSION, to increment the count on each refresh, and to show the count on web page.
13. Using PHP and MySQL, develop a program to accept book information viz. Accession number, title, authors, edition and publisher from a web page and store the information in a database and to search for a book with the title specified by the user and to display the search results with proper

headings.

14. Create a registration form using Angular JS.
15. Create a simple **AngularJS** calculator application using Angular Services.
16. Create an application Searching for a character and displaying its position using AngularJS.
17. Create an application using angular JS filters.
18. Create single page web applications using the MVC pattern of *AngularJS.*
19. Design an XML document to store information about a student in an engineering college affiliated to Amrita. The information must include USN, Name, Name of the College, Branch, Year of Joining, and e-mail id. Make up sample data for 3 students. Create a CSS style sheet and use it to display the document.
20. Create an XML document with the following sample real estate data
    - Root element real-estate will contain a sequence of sub-elements agencies, owners, properties and flats, all with an empty content
    - Ensure well-formedness
21. Create an internal DTD for the previous XML document
    - Ensure its validity
    - Then try to break it
22. Move the previous DTD to an external file and validate the XML document again
23. Create an application that loads a text string into an XML DOM object, and extracts the info from it with JavaScript.
24. Create an application which reads data from an XML file into XMLDOM object and retrieves the text value of the first element in the xml file.

SEMESTER V

18SSK301 LIFE SKILLS III 1 0 2 2

Course Objectives

To prepare the student for working in a team and develop proper attitude for teamwork

Course outcomes

CO1	Knowledge of team, teamwork, team building and leadership
CO2	Develop leadership quality and problem solving ability
CO3	Knowledge of group development activities: growth, productivity, evaluation and control
CO4	Learn how to communicate ideas within and to a group
CO5	Learn the skills of Lateral thinking for problem solving

Team Work: Value of Team work in organisations, Definition of a Team, Why Team, Elements of leadership, Disadvantages of a team, Stages of Team formation. Group Development Activities: Orientation, Internal Problem Solving, Growth and Productivity, Evaluation and Control. Effective Team Building: Basics of Team Building, Teamwork Parameters, Roles, Empowerment, Communication, Effective Team working, Team Effectiveness Criteria, Common characteristics of Effective Teams, Factors affecting Team Effectiveness, Personal characteristics of members, Team Structure, Team Process, Team Outcomes.

Facing an Interview: Foundation in core subject, Industry Orientation/ Knowledge about the company, Professional Personality, Communication Skills, activities before interview, upon entering interview room, during the interview and at the end. Mock interviews.

Advanced Grammar: Topics like parallel construction, dangling modifiers, active and passive voices, etc.

Syllogisms, Critical reasoning: A course on verbal reasoning. Listening Comprehension advanced: An exercise on improving listening skills.

Reading Comprehension advanced: A course on how to approach advanced level of reading, comprehension passages. Exercises on competitive exam questions.

Specific Training: Solving campus recruitment papers, National level and state level competitive examination papers; Speed mathematics; Tackling aptitude problems asked in interview; Techniques to remember (In Mathematics). Lateral Thinking problems. Quick checking of answers techniques; Techniques on elimination of options, Estimating and predicting correct answer; Time management in aptitude tests; Test taking strategies.

TEXTBOOKS:

1. *A Communicative Grammar of English: Geoffrey Leech and Jan Svartvik. Longman, London.*
2. *Adair J (1986) - "Effective Team Building: How to make a winning team", London, U.K: Pan Books.*
3. *Gulati S (2006) - "Corporate Soft Skills", New Delhi, India: Rupa& Co.*
4. *The Hard Truth about Soft Skills, by Amazon Publication.*

REFERENCES:

1. *Speed Mathematics, Secrets of Lightning Mental Calculations, by Bill Handley, Master Mind books;*
2. *The Trachtenberg Speed System of Basic Mathematics, Rupa& Co., Publishers;*
3. *Vedic Mathematics, by Jagadguru Swami Sri BharatiKrsnaTirthayi Maharaja, MotilalBanarsidass Publ.;*
4. *How to Ace the Brainteaser Interview, by John Kador, Mc Graw Hill Publishers.*
5. *Quick Arithmetics, by Ashish Agarwal, S Chand Publ.;*
6. *Quicker Maths, by M tyra& K Kundan, BSC Publishing Co. Pvt. Ltd., Delhi;*
7. *More Games Teams Play, by Leslie Bendaly, McGraw-Hill Ryerson.*
8. *The BBC and British Council online resources*
9. *Owl Purdue University online teaching resources*
10. *www.thegrammarbook.com online teaching resources*
11. *www.englishpage.com online teaching resources and other useful websites.*

18CSA307 C# AND .NET FRAMEWORK 2 0 2 3

Course outcomes

CO1	Learn to use .NET frame work and basic programming concepts in C#
CO2	Students will be able to develop programs to solve real world problems using OOPS concepts in C#
CO3	Understand the Window Programming and event driven programming
CO4	Learn to use ADO.net to store and retrieve data from database
CO5	Learn to use files using C#

Unit 1

.Net Framework Overview- Architecture-.Net Framework class Libraries-CLR-Metadata-Interoperability-Assemblies-the .net Packaging system-CLR-MSIL , Introduction to Visual Studio.Net-C# Programming Concepts-Predefined Types- Value types and reference type, Classes and Objects, Constructors and methods , Conditional statements, loops, arrays , Collection classes: ArrayList , HashTable, Stack ,Queue, indexers and properties.

Unit 2

String class: methods and properties of string class, enumerations, boxing and unboxing, OOPS concepts: Encapsulation, data hiding, inheritance, interfaces, polymorphism, operator overloading, overriding Methods, Static Class members, Delegates and events. Exception Handling, garbage collector, generics and collection

Unit 3

Basics of Windows Programming- Event Driven Programming, Windows Forms, Using common controls-Labels, textboxes, buttons, check boxes, radio button, progress bar, combo box, list box. Components-timer, imagelist, Menus, Modal and Modeless Dialog Boxes, MDI, Mouse and keyboard event handling.

Unit 4

Introduction to ADO.Net-Object Model- System. Data Namespace- Data Bound controls- Connected Mechanism-Disconnected mechanism-.Net Data Providers.

Unit 5:

Files: System.IO, directory and file types, Stream readers and stream writers, working with binary data.

Textbook/Reference:

1. C# 4.0 the Complete Reference by Herbert Schildt
2. Latest version of Andrew Trolsens C# text from Apress(Pro C# 5.0 and the .NET Framework 4.5)
3. Robert Powel, Richard Weeks, C# and the .NET Framework, Techmedia

18CSA306 ADVANCED JAVA AND J2EE 3 0 0 3

Objectives:*The main Objective of the course is to enable students to understand the concepts underlying technologies in JAVA Enterprise edition with Swings and multithreading, configuring Apache tomcat server, Java beans and Enterprise Java Beans.*

Course outcomes

CO1	Create a full set of UI widgets using Swing controls and demonstrate socket

	programming and learn to access database through Java programs, using Java Data Base Connectivity (JDBC)
CO2	Understand the concept of Servlets and create dynamic web pages, using Servlets
CO3	Understand the concept of JSP and create dynamic web pages, using JSP
CO4	Understand how session tracking is done using cookies
CO5	Understand the multi-tier architecture of web-based enterprise applications using Enterprise javabeans (EJB) and know to work in Hibernate and Spring frameworks

Unit 1

Networking: Classes to be covered Socket, ServerSocket, IPAddress, URL connections – Swing controls – JDBC - Writing JDBC applications using select, insert, delete, update.

Unit 2

SERVLETS: Introduction to Servlets (Life cycle of servlets, Java Servlets Development Kit, creating, Compiling and running servlet). The servlet API: javax. servlet package. Reading the servlet Parameters, Reading Initialization parameter. The javax.servlet.http.

Unit 3

JAVA SERVER PAGES: Configuring Tomcat JSP/Servlet server. Brief Introduction to J2EE Architecture. Advantage of JSP technology. JSP Architecture, JSP Access Model. JSP Syntax Basic (Directions, Declarations, Expression, Scriplets, Comments) JSP Implicit Object (Out, HttpServlet Request, Http Servlet Respose, Exception Handling, Session Management.

Unit 4

Package Handling HTTP Request and Response (GET/ POST Request), Using Cookies, Session Tracking. Exception Handling.

Unit 5

Introduction to EJB – Understanding MVC – Building Controllers, models and views – Integrating hibernate with spring.

TEXTBOOKS:

1. *Deitel&Deitel, "Java How to program", Prentice Hall, 4 th Edition, 2000.*
2. *Gary Cornell and Cay S. Horstmann, "Core Java Vol 1 and Vol 2", Sun Microsystems Press, 1999.*
3. *Stephen Asbury, Scott R. Weiner, Wiley, "Developing Java Enterprise Applications", 1998.*

18CSA389 MOBILE APPLICATION DEVELOPMENT LAB 0 1 2 2

Course outcomes

CO1	Understand the different API levels and working of Dalvik Vitual Machine
CO2	Get an idea about different 'views', layouts and resource files
CO3	Learn more about UI components - GridView and ListView, Action bar, Adapters, Menus: Option menu, context menu, sub menu, Pickers - Date and Time, Spinners.
CO4	Learn about Android Notifications
CO5	Provide knowledge for developing SQLite applications

Introduction: About Android, Pre-requisites to learn Android, Dalvik Virtual Machine & .apk file extension, Android API levels (versions & version names)

Android Java Basics: Getting started with Android development, project folder structure, simple programming, running project, generating build/APK of the app from Android Studio

First application: Creating Android Project, Android Virtual Device Creation, Set up debugging environment, Workspace set up for development, Launching emulator, debugging on mobile devices.

Basic UI design: Basics about Views, Layouts, Drawable Resources, Input controls, Input Events, Toasts.

More UI Components: Layouts - GridView and ListView, Action bar, Adapters, Menus: Option menu, context menu, sub menu, Pickers - Date and Time, Spinners.

Activity and Fragment: Activity, Fragment, Activity Lifecycle and Fragment Lifecycle.

Intents: Implicit Intents, Explicit intents, communicating data among Activities.

Navigation Drawer: Panel that displays the app's main navigation screens on the left edge of the screen

Android Notifications – Toast, Dialogs (TimePicker, DatePicker, Progress, Alert), Notification Manager and Push Notification

Introducing SQLite - SQLiteOpenHelper and creating a database - Opening and closing a database, Working with cursors Inserts, updates, and deletes

As a term project students should implement a mobile app with the following:

• Understand the app idea and design user interface/wireframes of mobile app • Set up the mobile app development environment

TEXTBOOKS/ REFERENCES:

Head first Android Development.

Android Programming: Pushing the Limits, Wiley By Erik Hellman

Android Application Development Black Book, Dreamtech Press, Pradeep Kothari, KLSI

18CSA388 ADVANCED JAVA AND J2EE LAB 0 0 2 1

Course outcomes

CO1	Identify, Design & develop complex Graphical user interfaces using Java Swing

	classes and develop Java client/server applications
CO2	Understand integrated development environment to create, debug and run Servlets
CO3	Understand integrated development environment to create, debug and run JSP
CO4	Design/Develop session tracking programs using Cookies
CO5	Create enterprise applications using Enterprise javabeans (EJB) and work in frameworks Hibernate and Spring

1. Program to demonstrate Swing components.
2. Program to implement Address Book using Swing components.
3. Program to demonstrate loading of file in an Swing Component.
4. Multithreading program, one of the threads print a….z and other thread print 1…26.
5. Example: 1a2b3c…. 26z.
6. Multithreading program to schedule two jobs.
7. Client Server Socket Programming.
8. Server Socket which receives data from a java client program using JSON
9. Program to fetch a particular Website tags when an URL is specified.
10. Implement stack, queue, hashmap, hashtable, enumeration, ArrayList.
11. Create a table from a java program.
12. Update a table from a java program.
13. Load a table data in Swing components.
14. Delete a record from a table, drop table from a java file.
15. Program which shows use of Statement, Prepared Statement and Callable Statement.
16. Configure Apache Tomcat and write a hello world jsp page.
17. Configure Apache Tomcat server to deploy Servlets.
18. Exceptional handling in a JSP page.
19. Create a login page and authenticate a user in a JSP page using database.
20. Write a program to implement a simple servlet which writes a Welcome HTML page in the web browser.
21. A servlet should receive a parameter from JSP page and process it.
22. Servlet program to implement parameter handling.
23. Servlet program to handle GET and POST request.
24. A website hit counter data which has to be saved in a cookie.
25. Implement a Java Beans to set and get values.
26. Program to illustrate the procedure of handling session and print a Hello world using Java Bean.
27. Enterprise Session Beans, deploy, and run a simple Java EE application which does add, subtract, multiply and division using stateless session bean.
28. An application named account using stateful session bean. The purpose of account is to perform transaction operations (deposit and withdraw) for the customer.
29. The account application consists of an enterprise bean, which performs the transactions, and two types of clients: an application client and a web client.

18CSA391 COMPREHENSIVE TECHNICAL VIVA-VOCE 2 cr

Course Objective

The objective of comprehensive viva-voce is to assess the overall knowledge of the student in the relevant field of computer science acquired over 3 years of study in the undergraduate program.

Course outcomes

CO1	Prepare comprehensively to answer questions from all the courses of five semesters.
CO2	Attain Oral Presentation skills by answering questions in precise and concise manner
CO3	Gain confidence and inter-personal skills.

The viva may be done based on every course covered till the sixth semester. The objective of this is to enable the students to attend placements and be better performers in their future.

18CSA392 MINOR PROJECT (OPTIONAL – leading to Paper Publication)3cr

Course outcomes

CO1	Acquire practical knowledge within the chosen area of technology for project development
CO2	Identify, analyse, formulate and handle programming projects with a comprehensive and systematic approach
CO3	Contribute as an individual or in a team in development of technical projects
CO4	Develop effective communication skills for presentation of project related activities

To expose the student to the industry-standard project practices, under time and deliverable constraints, applying the knowledge acquired through various courses done in the programme.

SEMESTER V1

18CSA317 COMPUTER GRAPHICS 3 0 0 3

Objectives: *The primary objective of this course is to give the basic principles of 2D and 3D computer graphics, to study the elementary mathematical techniques that allow us to position objects in three dimensional spaces and techniques necessary to produce basic 2D/3D dimensional illustrations.*

Course outcomes

CO1	Get an overview on Graphics applications
CO2	Learn the working of CRT, Flat Panel Displays, Three Dimensional Viewing Devices, Virtual Reality systems, Raster-Scan Systems, Random-Scan Systems.
CO3	Familiarized with Bresenham's Line Algorithm, Midpoint Circle Algorithm; Filled Area Primitives: Boundary-Fill Algorithm, Flood-Fill Algorithm
CO4	Understand the basic two dimensional transformations
CO5	Learn the graphics programming using openGL

Unit 1

Applications of Graphics: CAD, Presentation Graphics, Computer Art, Entertainment, Education and Training, Visualization, Image Processing,

Unit 2

Graphical User Interfaces - Overview of Graphics Systems: CRT, Flat Panel Displays, Three Dimensional Viewing Devices, Virtual Reality systems, Raster-Scan Systems, Random-Scan Systems.

Unit 3

Input Devices: Keyboards, Mouse, Data Glove, Digitizers, Touch Panels; Hard Copy Devices: Printers, Plotters. Output Primitives: Bresenham's Line Algorithm, Midpoint Circle Algorithm; Filled Area Primitives: Boundary-Fill Algorithm, Flood-Fill Algorithm; Character Generation; Homogeneous Coordinates.

Unit 4

Two Dimensional Geometric Transformations; Translation, Rotation, Scaling, Reflection, Shear; Two Dimensional Viewing: Cohen Sutherland Line Clipping Three Dimensional Geometric Transformations; Translation, Rotation, Scaling, Reflection, Shear; Three Dimensional Viewing: Projections, Parallel Projections, Perspective Projections, View Volumes and General Projection Transformations.

Unit 5

Graphics Programming: OpenGL Introduction: Command Syntax, Drawing and filling images, patterns, Filling regular and irregular shapes, Outputting Text, Justifying Text, Animation. Drawing with mouse, Building mouse cursors, freehand drawing using mouse, menus using mouse.

T**EXTBOOKS:**

1. Computer Graphics, C Version, D. Hearn, M.P. Baker, 2nd Edition, Pearson Education
2. OpenGL Programming Guide, M. Woo, J. Neider, T. Davis, D. Shreiner, 3rd edition, Pearson Education

18CSA318 CRYPTOGRAPHY AND CYBER SECURITY 4 0 0 4

Objectives: *The main objective of this course is to introduce the working of various cryptographic methods and how to apply this knowledge to real-world applications. This course will also present an overview of Cyber Security.*

Course outcomes

CO1	Introduces the need of security and various encryption techniques
CO2	Understand the use of public key crypto system
CO3	Able to provide authentication and integrity to the messages
CO4	Understand the digital signature standards and its application in real world
CO5	Have an idea about cyber crimes and digital forencics

Unit 1

Introduction to Cyber Security - Types of Attacks, Goals for Security, Security threat and vulnerability, Cyber security models (the CIA triad, the star model).

Classical encryption techniques substitution ciphers and transposition ciphers, cryptanalysis, steganography, Stream and block ciphers - Modern Block Ciphers: Block ciphers principles, Shannon's theory of confusion and diffusion. Data encryption standard (DES), Strength of DES, Idea of differential cryptanalysis, block cipher modes of operations.

Unit 2

Principals of public key crypto systems, RSA algorithm, security of RSA. Key Management and distribution: Symmetric key distribution, Diffie-Hellman Key Exchange, Public key distribution, Introduction to SSL.

Unit 3

Message Authentication Codes: Authentication requirements, authentication functions, message authentication code, hash functions, birthday attacks, security of hash functions,

Unit 4

Digital Signatures: Digital Signatures, Elgamal Digital Signature Techniques, Digital signature standards (DSS), proof of digital signature algorithm.

Unit 5

Introduction to Cyber Crime and security: Cyber Crimes, types of Cyber Crime, hacking, attack vectors, Cross Site Scripting (XSS), XSS Consequences. Cyber Space and criminal behaviour, traditional problems associated with Cyber Crime, Introduction to Incident Response, Digital Forensics - Phishing.

TEXTBOOK:

William Stallings, "Cryptography and Network Security: Principals and Practice", Pearson Education, Sixth Edition.

REFERENCE:

Nina Godbole and SunitBelpure, Cyber Security: Understanding Cyber crimes, ComputerForeinsics and Legal Perspectives, Willey India Pvt.Ltd.

Dr T R Padmanabhan N Harini,"Cryptography and Security Paperback", Wiley India

18CSA319 PYTHON PROGRAMMING 2 0 2 3

Course outcomes

CO1	Understand python variables, operators and data types
CO2	Get an idea about python control structures
CO3	Understand python complex data types

CO4	Work on Python flies and databases
CO5	Get an idea about python packages and GUI programming

Unit 1

Introduction to Python: Python variables, Python basic Operators, Understanding python blocks. Python Data Types, Declaring and using Numeric data types: int, float etc.

Unit 2

Python Program Flow Control Conditional blocks: if, else and else if, Simple for loops in python, For loop using ranges, string, list and dictionaries. Use of while loops in python, Loop manipulation using pass, continue, break and else. Programming using Python conditional and loop blocks.

Unit 3

Python Complex data types: Using string data type and string operations, Defining list and list slicing, Use of Tuple data type. String, List and Dictionary, Manipulations Building blocks of python programs, string manipulation methods, List manipulation. Dictionary manipulation, Programming using string, list and dictionary in-built functions. Python Functions, Organizing python codes using functions.

Unit 4

Python File Operations: Reading files, Writing files in python, Understanding read functions, read(), readline(), readlines(). Understanding write functions, write() and writelines() Manipulating file pointer using seek Programming, using file operations.

Database Programming: Connecting to a database, Creating Tables,INSERT, UPDATE, DELETE and READ operations, Transaction Control,Disconnecting from a database, Exception Handling in Databases.

Unit 5

Python packages: Simple programs using the built-in functions of packages matplotlib, numpy, pandas etc.
GUI Programming: Tkinter introduction, Tkinter and PythonProgramming, Tk Widgets, Tkinter examples.
Python programming with IDE.

Text Book/References

1. Wesley J. Chun, “Core Python Applications Programming”, 3rd Edition , Pearson Education, 2016
2. Charles Dierbach, “Introduction to Computer Science using Python”, Wiley, 2015
3. Jeeva Jose &P.SojanLal, “Introduction to Computing and Problem Solving with PYTHON”, Khanna Publishers, New Delhi, 2016
4. Downey, A. et al., "How to think like a Computer Scientist: Learning with Python", John Wiley, 2015
5. Mark Lutz, “Learning Python”, 5th edition, Orelly Publication, 2013, ISBN 978- 1449355739
6. John Zelle, “Python Programming: An Introduction to Computer Science”, Second edition, Course Technology Cengage Learning Publications, 2013, ISBN 978- 1590282410
7. Michel Dawson, “Python Programming for Absolute Beginers” , Third Edition, Course Technology Cengage Learning Publications, 2013, ISBN 978-1435455009
8. David Beazley, Brian Jones., “Python Cookbook”, Third Edition, Orelly Publication, 2013, ISBN 978-1449340377

18CSA383 COMPUTER GRAPHICS LAB 0 0 2 1

Course outcomes

CO1	Able to draw primitive shapes
CO2	Learn to transform different geometrical shapes
CO3	Able to do rotation with different algorithms

CO4	Develop knowledge about midpoint rotation
CO5	Able to do polygon clipping and line clipping

1. Write a program for 2D line drawing as Raster Graphics Display.
2. Write a program for display basic 2D geometric primitives.
3. Write a program to display a filled square.
4. Write a program to display a series of concentric circles of varying radius.
5. Write a program for line drawing as Raster Graphics Display.
6. Write a program for circle drawing as Raster Graphics Display.
7. Write a program to draw a line using Bresenham line drawing algorithm
8. Write a program to draw a circle using Midpoint algorithm. Modify the same for drawing an arc and sector.
9. Write a program to rotate a point about origin.
10. Write a program to rotate a triangle about origin.
11. Write a program to scale the triangle using 2D transformation.
12. Write a program to translate a triangle using 2D transformation.
13. Write a program to reflect a triangle 2D transformation.
14. Write a program for polygon filling as Raster Graphics Display
15. Write a program for line clipping.
16. Write a program for polygon clipping.
17. Write a program for displaying 3D objects as 2D display using perspective transformation.
18. Write a program for rotation of a 3D object about arbitrary axis.
19. Write a program in openGL for building mouse cursors.
20. Write a program in openGL for freehand drawing using mouse.

18CSA399 PROJECT 6 cr

Course outcomes

CO1	Acquire practical knowledge within the chosen area of technology for project development
CO2	Identify, analyze, formulate and handle programming projects with a comprehensive and systematic approach
CO3	Contribute as an individual or in a team in development of technical projects
CO4	Develop effective communication skills for presentation of project related activities

To allow students to develop their own ideas and get experienced in industrial and research projects. It provides an opportunity in solving a real life problem by applying the knowledge gained through various courses of study and an exposure on different phases of software /system development life cycle.

ELECTIVES

18CSA331 ARTIFICIAL INTELLIGENCE 3 0 0 3

Course outcomes

CO1	Understand the need of AI and issues in designing search problems
CO2	Know various AI search algorithms (uninformed, informed, heuristic, constraint satisfaction, genetic algorithms)
CO3	Understand the fundamentals of knowledge representation (logic-based, frame-based, semantic nets), inference and theorem proving
CO4	Demonstrate working knowledge of reasoning in the presence of incomplete and/or uncertain information
CO5	Ability to apply knowledge representation and reasoning to real-world problems, to develop expert systems

Unit 1

What is Artificial Intelligence? – The AI Problems – The Underlying Assumption – What is an AI technique – Criteria for Success.

Problems, Problem Spaces and Search – Defining Problem as a State Space Search – Production Systems – Problem Characteristics – Production System Characteristics – Issues in the design of Search Programs.

Unit 2

Heuristic Search Techniques - Generate – and – Test – Hill Climbing – Best-First Search – Problem Reduction – Constraint Satisfaction - Means - Ends Analysis. Knowledge Representation issues – Representations and Mapping - Approaches to knowledge Representation – Issues in knowledge Representation – The Frame Problem. Using Predicate Logic – Representing simple facts in Logic – Representing Instance and Isa

Relationship – Computable Functions and Predicates – Resolution – Natural Deduction.

Unit 3

Representing Knowledge Using Rules – Procedural versus Declarative knowledge – Logic Programming – Forward versus Backward Reasoning – Matching – Control Knowledge.

Symbolic Reasoning under Uncertainty – Introduction to Non-monotonic Reasoning – Augmenting a Problem Solver – Implementation: Depth - First Search.

Statistical Reasoning – Probability and Baye's Theorem – Bayesian Networks – Fuzzy Logic.

Unit 4

Game Playing - The Minimax Search Procedure – Adding Alpha-Beta Cutoffs.

Understanding – What is Understanding? What makes Understanding hard?

Unit 5

Common Sense – Qualitative Physics – Commonsense ontology – Memory Organization - Expert Systems – Representing and Using Domain knowledge – Expert System Shells – knowledge Acquisition - Components of an AI program.

TEXTBOOKS:

1. *Artificial Intelligence (Second Edition) – Elaine Rich, Kevin knight (Tata McGraw-Hill)*
2. *A Guide to Expert Systems – Donald A. Waterman (Addison-Wesley)*

REFERENCES:

1. *Principles of Artificial Intelligence – Nils J. Nilsson (Narosa Publishing House)*
2. *Introduction to Artificial Intelligence – Eugene Charnaik, Drew McDermott (Pearson Education Asia)*

18CSA332 ARCHITECTURE AND DEPLOYMENT OF SECURE AND SCALABLE WAN
3 0 0 3

Course outcomes

CO1	Understand what are the design considerations for the enterprise network.
CO2	Learn to configure and troubleshoot WLAN
CO3	Understand the operation and confioguration of WAN technologies
CO4	Learn datalink protocol like PPP, HDLC and and NAT concepts
CO5	Understand VPNs and IPSec ; Students will be able to troubleshoot and monitor the network using various tools

Unit 1

Introduction to Scaling Networks, Implementing a Network Design, LAN Redundancy, Spanning Tree Concepts and protocols.

Unit 2

Link Aggregation Concepts and Configuration, Wireless LAN Concepts, operations and Security, Wireless LAN Configuration, Troubleshoot Single-Area OSPF, Multiarea OSPF

Unit 3

Operation and configuration. Hierarchical Network Design, WAN Technologies, Spanning Tree Configuration, First-Hop Redundancy Protocols, Point-to-Point Connections.

Unit 4

PPP Operation and Configuration, HDLC protocol, Troubleshoot WAN Connectivity, Frame Relay concepts and Configurations, NAT Operation & Configuration, Troubleshooting NAT

.

Unit 5

Tele working, Broadband Solutions, Configuring xDSL Connectivity, Securing Site-to-Site Connectivity, VPNs, Site-to-Site GRE Tunnels, IPsec, Monitoring the Network – Syslog, SNMP, Netflow, Network Troubleshooting with a Systematic Approach.

TEXTBOOKS:

1. *Youlu Zheng and ShakilAkhtar,"Networks for Computer Scientists and Engineers".*
2. *Peterson & Davie, "Computer Networks, A Systems Approach", 5th Edition, Morgan Kaufmann, 2011.*

REFERENCES:

1. *"Scaling Networks - Course Booklet ", Cisco Press.*
2. *"Switched Networks - Course Booklet", Cisco Press.*

18CSA333 CLIENT SERVER COMPUTING 3 0 0 3

Objectives*: Client Server Computing Model defines the way successful organizations will use technology during the next decade. As a result knowledge of client server architecture has become an essential part of computer science. The main objective is to provide the basic concepts of client server computing and the new technologies involved in it.*

Course outcomes

CO1	Be familiar with the concepts of client server systems,its architecture,different client server models,types of clients and servers.
CO2	To get an idea about the role and services of client and server.
CO3	To get an idea abot client server system architecture,types of middleware and ODBC architecture.
CO4	To familiarise the concept of server architecture,C/S transaction processing models,datawarehoue and data mining.
CO5	To get an idea about client server protocols and CORBA architecture.

Unit 1

Client Server System Concepts – Introduction – Concepts - Client Server Architecture - Two-Tier Architecture – Three-Tier Architecture - N-Tier Architecture - N-Tier vs 2-Tier Architecture - Case Study of N-Tier Architecture - Client Server Models - Gartner Classification – Middleware - Characteristics and types of Server - File Server - Database Server - Communication Server - Object Server - Groupware Server - Transaction Server - Characteristics and types of Clients - Thin Client - Fat Client.

Unit 2

Components of Client Server Computing – Client - Role of the Client - Client Services - Request for Service - Components of Client Server Computing – Server - Role of the Server - Server Functionality in detail - Components of Client Server Applications – Connectivity – OSI - Communications Interface Technology.

Unit 3

Client Server System Architecture - Client Server Building Blocks – Hardware - Client Hardware - Server Hardware - Client Server Building Blocks – Software - Client Server Systems Development Methodology - Project Management - Architecture Definition - Systems Development Environment – Middleware - Types of Middleware - DCE, MOM, TP – Monitors – ODBC - Design Overview of ODBC - ODBC Architecture – Components – Applications - Driver Managers - Database Drivers - ODBC Data Sources - Network Operating System - Base Services - External Services.

Unit 4

SQL Database Servers - Server Architecture - Multithread Architecture - Hybrid Architecture - Stored Procedures – Triggers - Client Server Transaction Processing - Rules of Client Server Transaction Processing - Transaction Models - Chained and Nested Transactions - Transaction Management Standards - Data Warehousing - Warehousing Techniques - Data Mining.

Unit 5

Client Server Protocols – RPC – IPC - Recent Trends – Intranet – Extranet – Internet - CORBA.

TEXTBOOK:

Robert Orfali, Dan Harkey and Jerri Edwards: Essential Client/Server Survival Guide, John Wiley &Sons Inc 1996

REFERENCES:

1. Alex Berson: Client Server Architecture

2. Patrick Smith, Steve Guengerich: Client Server Computing, Second Edition, Prentice Hall of India Pvt Ltd.

18CSA334 EMBEDDED SYSTEMS 3 0 0 3

Course outcomes

CO1	Provides an overview, categories, challenges and issues of embedded sysems.
CO2	Understand the hardware support and chip level features to develop embedded systems
CO3	To create awareness about the Hardware Design, Software Development & RTOS for the Embedded Systems.
CO4	Design embedded systems using real time operating systems
CO5	Learn to use tools, simulators for embedded systems and security issues

Unit 1

An Overview of Embedded System - What is an Embedded System? – Categories of Embedded Systems – Requirements of Embedded Systems - Challenges and issues in Embedded Software Development – Trends in Embedded Software Development - Applications of Embedded Systems.

Unit 2

Hardware Fundamentals for the Software Engineer - Gates – Timing Diagrams – memory – Microprocessors – Buses – DMA – Interrupts - Other Common Parts – Built-ins on the microprocessor – Interrupts - Microprocessor Architecture – Interrupt Basics – The Shared Data Problem – Interrupt Latency.

Unit 3

Survey of Software Architectures - Round Robin – Round Robin with Interrupts – Function Queue Scheduling Architecture – Use of real time operating system. RTOS, Tasks, Scheduler, Shared data reentrancy - priority inversion, mutex binary semaphore and counting semaphore – Selecting an Architecture - Introduction to Real Time Operating Systems - Tasks and Task states – Tasks and Data – Semaphores and Shared Data – Message Queues mailboxes and pipes – Timer functions – Events – Memory management – interrupt routines in an RTOS environment.

Unit 4

Basic Design Using a Real Time Operating System - Overview – Principles – Encapsulating Semaphores and Queues – Hard Real - Time Scheduling Considerations – Saving memory space – saving power - Embedded Software Development Tools - Host and Target Machines – inker/Locators for Embedded Software – Getting Embedded software into the target systems.

Unit 5

Debugging Techniques - Testing on Host Machine – Instruction Set simulators – The assert Macro – Using Library Tools - Future Trends in Embedded Systems - System on a chip (SOC) – Smart Cards and the cashless society – Security in Embedded System.

TEXTBOOKS:

1. *Dr.K.V.K.K. Prasad &Vikas Gupta – Programming for Embedded Systems – Wiley 1st edition 2002*
2. *David E. Simon – An Embedded Software Primer- Pearson Education Asia – 1999*

REFERENCES:

1. *Caroline Yao &Quing Li – Real Time Concepts for Embedded Systems*
2. *Kirk Zureli - C Programming for Embedded Systems*

18CSA335 ENTERPRISE RESOURCE PLANNING MANAGEMENT 3 0 0 3

Course outcomes

CO1	To get an idea about integrated management information,resource management , ERP benefits and the significance and principles of BE
CO2	Be familiar with the Business modelling for ERP and its implementation.
CO3	To famliarise the concept of ERP and the competitive strategy and different ERP domains.
CO4	To get an idea about market dynamics and competitive strategy of ERP using case studies.
CO5	To get an idea about ERP and client server architecture,open source ERP and commercial ERP.

Unit 1

Introduction to ERP

Accommodating Variety – Integrated Management Information – Seamless Integration – Supply Chain Management – Resource Management – Integrated Data Model – Scope – Technology – Benefits of ERP.

Business Engineering and ERP

What is BE? – Significance and Principles of BE – BPR, ERP and IT – BE with IT – ERP and Management Concerns.

Unit 2

Business Modelling for ERP

Building the Business Model.

ERP Implementation

Role of Consultants, Vendors and Users – Customization – Precautions – ERP: Post-implementation Options – ERP Implementation Methodology – Guidelines for ERP Implementation.

Unit 3

ERP and the Competitive Advantage

ERP and the Competitive Strategy.

The ERP Domain

MFG/PRO, IFS/Avalon - Industrial and Financial systems – Baan IV – SAP – SAP R/3 Applications – Example of an Indian ERP Package – The Arrival of ERP III.

Unit 4

Marketing of ERP

Market Dynamics and Competitive Strategy.

Sample Case Studies

Unit 5

Client Server and ERP Architecture

Introduction to Client Server – Advantages and Disadvantages – N tier Architecture – ERP Architecture.

http://ebuild.imtindia.com/erp_software_architecture.html

Open Technology

Background of Open Technology – Introduction – Proprietary v/s Open source – Need for Open Source Solutions – Open Source ERP.

http://elearning.nic.in/mdp/2-open-technology/opentechnology-mdp.pdf

Commercial ERP

Commercial ERP – Open Source ERP v/s Commercial ERP.

http://www.erpwire.com/erp-articles/commercial-and-open-source-erp.htm

TEXTBOOK:

"Enterprise Resource Planning – Concepts and Practice", Vinod Kumar Garg, N.K. Venkitakrishnan, Second Edition, Eastern Economy Edition, Prentice-Hall of India Pvt., Ltd., 2008.

18CSA336 KNOWLEDGE MANAGEMENT 3 0 0 3

Course outcomes

CO1	Define and discuss the key components of information and knowledge management infrastructure
CO2	Understand the use of web warehouse and GIS
CO3	Learn to use different text mining techniques
CO4	Gives an idea of knowledge management principles
CO5	Provides an overview of Intenet and Internet Services.

Unit 1

Introduction – Applied Knowledge Management – Web Warehousing and Knowledge Management – Value Chains and Killer Applications.

Unit 2

Web Warehousing in Action – Traditional Warehousing – Web Based Graphical Geographic Information System.

Unit 3

An Introduction to Text Information Management System – Architecture of Text Information Management System – Text Mining Systems.

Unit 4

Knowledge Management Principles – Knowledge Management at work in Organization.

Unit 5

Technology Foundations – The Internet and Internet Services – Web Components and Communications.

TEXTBOOKS:

Web Warehousing and Knowledge Management: Mattison 1999, Tata McGraw-Hill

Measuring and Managing Knowledge: Tom Housel and Arthur Bell 2001, International Edition, Tata McGraw-Hill

REFERENCE:

Knowledge Management: Ganesh Natarajan, President & CEO Aptech

18CSA337 LAN SWITCHING AND ADVANCED ROUTING 3 0 0 3

Course outcomes

CO1	understand the use of IPV4 and IPV6 and the working of switched networks and LAN
CO2	Student will be able to configure a VLAN
CO3	Understand the routing and to configure routing protocols in routers
CO4	Able to configure RIP and OSPF routing protocols
CO5	Learn to implement ACL for implementing security accoring to the requirements of an organization

Unit 1

IPv4 4 & IP V6 Network Addresses, IPv6 Network Addresses, Subnetting IP Networks, Network Design & trouble shooting for IPv4 & IPv6. Introduction to Switched Networks, LAN Design.

Unit 2

Basic Switching Concepts and Configuration, Switch Security: Management and Implementation, VLANs.

Unit 3

Routing Concepts & operations, Configuration of a Router, Media Access Control, Inter-VLAN Routing, Layer

3 Switching, Static Routing Implementation, Configure Static and Default Routes, CIDR and VLSM.

Unit 4

Network security, Dynamic Routing Protocols, Distance Vector Routing Protocols, RIP(IPv4) and RIPng(IPv6) Routing, Link-State Dynamic Routing, The Routing Table, Single-Area OSPF, Configuring Single-Area OSPFv2 (IPv4) & v3(IPv6).

Unit 5

Access Control Lists and operations, Configuring and Troubleshooting Standard & extended IPv4 ACLs, IPv6 ACLs, DHCPv4 (IPV4) DHCPv6(IPv6).

TEXTBOOKS:

1. James F. Kurose and Keith W. Ross "Computer Networking: A Top-Down Approach", 4th Edition, Addison-Wesley, 2008.

2. Andrew S.Tanenbaum, "Computer Networks", 3rd Edition, PHI, 2004.

REFERENCES:

1. Introduction to Networks-Course Booklet ",Cisco Press

2. Routing and Switching Essentials – Course Booklet", Cisco Press

18CSA338 MICROPROCESSOR SYSTEM 3 0 0 3

Course outcomes

CO1	Learn the basic concepts of combinational and sequential logic circuits
CO2	Identify a detailed h/w structure of the Microprocessor 8086/8088.
CO3	To learn 8086/88 Microprocessor programming
CO4	Understand 8086/88 microprocessor and their memory interfaces
CO5	analyze the data transfer information through serial & parallel ports

Unit 1

Combinational circuit implementations – Introduction – NAND & NOR implementations – Arithmetic circuits – Flip-flops - counters – Ripple counters – Synchronous counters.

Unit 2

Introduction to Microprocessor and microcomputers – General architecture of a micro computer system – 8086/88 microprocessor - Architecture – software model of 8086/88 – Memory address space – Data organization – Data types – Registers in 8086/88 – Addressing modes – instruction formats – I/O Address space.

Unit 3

8086/88 Microprocessor programming – Instruction set – Data transfer instructions – arithmetic – Logic – shift – rotate – Flag control – compare – jump – subroutines – loops – string handling instructions.

Unit 4

8086/88 microprocessor and their memory interfaces – Introduction – system clock – bus cycle – Hardware organization of the memory address space – read/write bus cycles – memory interface circuits.

Unit 5

I/O interfacing with 8086/88 microprocessor – Types of I/O – I/O data transfer – I/OP instructions – bus cycles – 8255 PPI – 8237A DMA controller Interrupt handling – types – Interrupt address pointer table – Interrupt instructions – enabling and disabling interrupts – 8259A Programmable Interrupt Controller.

TEXTBOOK:

The 8086 and 8088 microprocessors – Programming, Interfacing, Software, Hardware and Applications – Walter A tribbel, AvtarShing – PHI

REFERENCE BOOKS:

1. *Digital Logic Design – Langholz, Kandel, Mott - 1988 Wm C. Brown publishers*
2. *Microcomputer systems: 8086/88 family architecture, programming and design – Yu-ching Liu, Glenn A Gibson – PHI*
3. *The 8086/88 family – John Uffenbeck – PHI*

18CSA339 MULTIMEDIA AND GRAPHICS 3 0 0 3

Course outcomes

CO1	Developed understanding of technical aspect of Multimedia Systems.
CO2	Develop various Multimedia Systems applicable in real time.
CO3	Design interactive multimedia software.
CO4	Apply various networking protocols for multimedia applications.
CO5	To evaluate multimedia application for its optimum performance.

Unit 1

Introduction: What is Multimedia? – Introduction to making Multimedia - Media Skills – Macintosh and Windows Platforms – Basic software tools.

Unit 2

Making instant Multimedia – Multimedia Authoring tools.

Unit 3

Multimedia Building Blocks: Text – Sound – Images.

Unit 4

Multimedia Building Blocks: Animation – Video.

Unit 5

Multimedia and the Internet: The Internet and how it works – Tools for World Wide Web – Designing for the World Wide Web.

TEXTBOOK:

Tay Vaughan – Multimedia (Making it work) - Tata McGraw Hill – ISBN-0-07-047276-9

REFERENCES:

Nigel Chapman – Digital Multimedia – Wiley – ISBN – 81-265-0489-7

John F. Koegel Buford – Multimedia Systems – PEARSON – ISBN – 81-78-08-162-8

18CSA340 SOCIAL AND PROFESSIONAL ISSUES IN COMPUTING 3 0 0 3

Course outcomes

CO1	Able to identifiy social and ethical issues that arise in the development and application of computing technology in modern society
CO2	Understand the responsibilities of computer professionals as defined by the Software Engineering Code of Ethics and Professional Practice
CO3	Understand risks and security operations in an organization
CO4	Able to formulate viewpoints concerning the current legal and ethical status of intellectual property rights – specifically trade secrets, trademarks, copyrights, patents, and licensing – as they relate to computer software
CO5	Able to handle some legal issues related to computer crime and hacking

Unit 1

Social Context: Introduction to the social implications of computing, Social implications of networked communication, Growth of, Control of, and access to the Internet, Gender – Related issues, Cultural issues, International Issues, Accessibility Issues (e.g. underrepresentation of minorities, Women and disabled in the computing profession), Public policy issues (e.g. electronic voting).

Unit 2

Analytical Tools: Making and evaluating ethical arguments, Identifying and evaluating ethical choices, Understanding the social context of design, Identifying assumptions and values.

Professional Ethics: Community values and the laws by which we live, The nature of professionalism (Including care, attention and discipline, fiduciary responsibility, and mentoring).

Keeping up-to-date as a professional (in terms of knowledge, tools, skills, legal and professional framework as well as the ability to self-assess and computer fluency), Various forms of professional credentialing and the advantages and disadvantages, The role of the professional in public policy, Maintaining awareness of consequences, Ethical dissent and whistle-blowing.

Codes of ethics, conduct, and practice(IEEE, ACM, SE, AITP, and so forth), Dealing with harassment and

discrimination, “Acceptable use” policies for computing in the work place.

Healthy Computing environment (ergonomics)

Unit 3

Risks: Historical examples of software risks (such as the Therac-25 case), Implications of software complexity, Risk assessment and Risk Management; Risk removal, risk reduction and risk control.

Security Operations: Physical security, Physical access controls, Personnel access controls, Operational security, Security polices for systems/networks, Recovery and Response, Dealing with problems (both technical and human)

Unit 4

Intellectual Property: Foundations of Intellectual Property, Copyrights, patents, and trade secrets, Software Piracy, Software Patents, Transactional issues concerning Intellectual Property.

Privacy and Civil Liberties: Ethical and legal basis for privacy protection, Ethical and legal framework for freedom of information, Privacy implications of database systems (e.g. Data gathering, storage and sharing, massive data collecting, computer surveillance systems)

Technological strategies for privacy protection, Freedom of expression in cyberspace, International and intercultural implications.

Unit 5

Computer Crime: History and examples of computer crime, “Cracking” (“Hacking”) and its effects, Viruses, Worms, and Trojan Horses, Identity Theft, Crime Prevention strategies.

TEXTBOOK:

Ethics for Information Age, 3rd Edition, Michael J. Quinn, Pearson/Addison Wesley, 2009

18CSA341 SOFT COMPUTING 3 0 0 3

Course outcomes

CO1	Understand the concepts of neural networks
CO2	To have an understanding of the concepts of fuzzy sets, knowledge representation using fuzzy rules, and applications
CO3	Basic understanding of supervised learning algorithms
CO4	Comprehend the concept of hybrid systems
CO5	Understand the basics of Evolutionary Computation

Unit 1

Basic Concepts - Single Layer Perception - Multilayer Perception - Supervised and Unsupervised Learning - Back Propagation networks - Kohnen's self-organizing networks - Hop field networks - Distance measures.

Unit 2

FUZZY sets, properties, Membership functions Fuzzy operations, Applications.

Unit 3

Classification and Regression Trees - Data Clustering Algorithms - Rule based Structure identification.

Unit 4

Neuro-Fuzzy Systems.

Unit 5

Evolutionary Computation - Survival of the Fittest - Fitness Computation – Crossover – Mutation – Reproduction - Rank space Method. Case Studies: Applications of soft computing.

TEXTBOOK/ REFERENCES:

1. Laurence Fausett,"Fundamentals of Neural Networks", Seventh Edition, Dorling Kindersley (India) P. Ltd 2006.

2. Satish Kumar - "Neural Networks – A Classroom Approach", Tata McGraw-Hill, 2004.

3. Timothy J.Rose, "Fuzzy Logic with Engineering Applications", Third Edition, John Wiley, 2010.

4. J.S.R Jang,C.T Sun and E.Mizutani, "Neuro-Fuzzy and Soft Computing", Second Edition, Prentice Hall of India, 2002.

5. D.E.Goldberg "Genetic Algorithms in search, optimization and Machine learning", Second Edition, Addison Wesley, 2007.

18CSA342 SYSTEMS AND NETWORK ADMINISTRATION 3 0 0 3

Course outcomes

CO1	Understand the need of system and network administration
CO2	Learn about Diskquotas
CO3	Students get an idea about network topologies, network devices, TCP/IP configuration..etc.
CO4	Learn to configure a SAMBA SERVER
CO5	Understand Active Directory concepts, network monitoring using Wire Shark, and importance of port numbers

Unit 1

Understanding System Administration – Network Operating System - Network File System – Admin User - Administration Tools – Commands - Configuration Files – Log Files - Backup and Restore Files.

Unit 2

User Management - Issues - Registration – Account Policy – Login environment – Setting up and Supporting Users – Disk Quotas.

Unit 3

Network Administration – Topologies – Network Devices - Understanding TCP/IP – Administering TCP/IP - Network Configuration – Static and Dynamic.

Unit 4

Introduction to File Server – Setting Up a File Server – Network File Systems - SAMBA – Web Server.

Unit 5

Understanding Directory Services – Active Directory – Network Security – Importance of Port Number – Tracking Services – Monitoring your System – Network Security Tools.

TEXTBOOKS:

1. *Red Hat Linux - System Administration*
2. *Introducing Microsoft Windows Server 2003 – Jerry Homeycutt – PHI*

REFERENCE:

Mark Burgess – Principles of Network and System Administration - Second Edition - John Wiley & Sons