



Bachelor of Computer Application (BCA)

Curriculum and Syllabus Regulation 2021

Based on Choice Based Credit System (CBCS)

and

Learning Outcomes based Curriculum Framework (LOCF)

**Effective from the Academic year
2021-2022**

**Department of Information Technology
School of Computing Sciences**

DEPARTMENT OF INFORMATION TECHNOLOGY SCHOOL OF COMPUTING SCIENCES

VISION

- The Department of Information Technology aims to produce globally competent graduates, skilled intellectual professionals and a successful entrepreneur in the field of computer science and Information Technology to meet the current challenges in the fast growing IT industry.

MISSION

- Provide a strong theoretical and practical knowledge to the students in computer science discipline.
- To equip our Students to attain skill set Imperative to harness the opportunities present in this dynamic Environment.
- Provide technical & skill based quality training to the students in the field of Information technology
- Empowering the Youth in rural communities with computer knowledge
- Inculcate knowledge about Socio-economic duties & responsibilities, Human & ethical values to become an optimistic global citizen and a life-long learner.
- Provide environmental education to build knowledge on environmental issues and also to take necessary actions to keep our environment healthy and sustainable for the future.

PROGRAM EDUCATIONAL OBJECTIVES (PEO)

- PEO1:** Emerge as globally competent computer professionals in multidisciplinary domains.
- PEO2:** Excel as socially committed individual having an ethical values and empathy for the need of society
- PEO3:** Become an entrepreneur possessing a leadership skill that can provide solutions and develop software products.
- PEO4:** Involve in lifelong learning to adapt the latest technologies and advancements in the emerging areas of computer applications.
- PEO5 :** Provide technical & skill based quality training to the students in the field of Information technology

PROGRAM OUTCOME (PO)

PO1:Critical Thinking: Apply knowledge of Computer Science to identify, analyze, problems and to provide effective solution in the area of Computing.

PO2:Computing Skills and Ethics: Analyze a problem, and identify and define the computing requirements appropriate to its solution.

PO3: Analytical skill: Ability to design, develop algorithms and provide software solutions to cater the industrial needs.

PO4:Modern Tool Usage: Use current techniques, skills, and tools necessary for computing practices

PO5: Employability Skills: Inculcate skills to excel in the fields of Information Technology and its Enabled services, Government and Private sectors, Teaching and Research.

PO6: Ethics: Insists ethical responsibilities, human and professional values and make their contribution to the society.

PO7: Self Directed and Life-long Learning: Engaged in lifelong learning to equip them to the changing environment and be prepared to take-up mastering programmes.

PO8: Individual and team work: Function effectively as an individual, and as a member or a leader in diverse team and multidisciplinary settings.

PO9: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO10:Project management and finance: Demonstrate knowledge and understanding of the problem and management principles and apply

PO11:Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data

PO12: Design/development of solutions: Design solutions for complex problems to meet the specified needs, considering the public health and safety cultural, societal, and environment.

PROGRAMME SPECIFIC OUTCOME (PSO)

PSO1: Understand the basic concepts in computer.

PSO2: An ability to apply knowledge of mathematics, computer science and management in practice.

PSO3: An ability to enhance not only comprehensive understanding of the theory but its application too in diverse field

PSO4: Analyze and apply the latest technologies to solve problems in the areas of computer applications.

PSO5: Apply technical and professional skills to excel in business.

PSO6: Able to build software applications and tools through quantitative and qualitative techniques

PSO7: Able to design a computing system to meet desired needs within realistic constraints such as safety, security and applicability in multidisciplinary teams with positive attitude.

PSO8: Develop practical skills to provide solutions to industry, society and business

PSO9: Able to communicate effectively in both verbal and written form.

Vels Institute of Science Technology & Advanced Studies
School of Computing Sciences
Department of Information Technology
Board of Studies Members

S.No	Name & Designation	Address	Role
1	Dr.P.Mayilvahanan Professor & Head	Department of Computer Science, School of Computing Sciences, VISTAS, Chennai.	Chairman
2	Dr. T. Velmurugan Associate Professor & Head	Department of Computer Science, DG Vaishnav College, Chennai.	Industry Expert (External Member)
3	Dr. P. Magesh Kumar Managing Director	Calibsoft Technologies Pvt Ltd., Chennai.	Academic Expert (External Member)
4	Mr.R. Balamurugan Software Engineer	SCOPUS Technologies Ltd., Chennai	Alumni Member
5	Dr.S.Prasanna Professor & Head	Department of Computer Applications, School of Computing Sciences, VISTAS, Chennai	Internal Member
6	Dr. T. Kamalakannan Professor & Head	Department of Information Technology, School of Computing Sciences, VISTAS, Chennai	Internal Member

**VELS INSTITUTE OF SCIENCE, TECHNOLOGY AND ADVANCED
STUDIES (VISTAS), CHENNAI
CHOICE BASED CREDIT SYSTEM (CBCS)
and
LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (LOCF)
UG REGULATIONS 2021
BCA DEGREE**

(Applicable to all the candidates admitted from the academic year 2021-22 onwards)

1. DURATION OF THE PROGRAMME

1.1. Three years (six semesters)

1.2. Each academic year shall be divided into two semesters. The odd semesters shall consist of the period from July to November of each year and the even semesters from January to May of each year.

1.3 There shall be not less than 90 working days for each semester.

2. ELIGIBILITY FOR ADMISSION

Students should have passed the Higher Secondary Examinations of (10+2) stream with **Computer Science** or **Mathematics/Business Maths** as one of the subjects or any examination of any other authority accepted by the Board of Management of VISTAS.

3. MEDIUM OF INSTRUCTION

The medium of instruction for all UG programmes is English excluding Tamil, Hindi and French Language Papers

4. CREDIT REQUIRMENTS AND ELIGIBILITY FOR AWARD OF DEGREE

A Candidate shall be eligible for the award of Degree only if he/she has undergone the prescribed course of study in VISTAS for a period of not less than three academic years and passed the examinations of all the prescribed courses of Six Semesters earning a minimum of 140 credits as per the distribution given in for Part I, II, III and also fulfilled such other conditions as have been prescribed thereof.

5. COURSE

Each course / subject is to be designed under lectures / tutorials / laboratory or field work /

seminar / practical training / Assignments / Term paper or Report writing etc., to meet effective teaching and learning needs.

6. COURSE OF STUDY AND CREDITS

The Course Components and Credit Distribution shall consist Part I, II & III:

The UG programme consists of a number of courses. The term ‘course’ is applied to indicate a logical part of the subject matter of the programme and is invariably equivalent to the subject matter of a ‘paper’ in the conventional sense. The following are the various categories of courses suggested for the UG programmes.

Part I – Language Courses (LC) (any one of Tamil, Hindi, French or special subject designed in lieu of the above).

Part II – English Language courses (ELC) or special subject designed in lieu of.

The Language courses and English Language Courses are 4 each / 2 each in number and the LC and ELC are meant to develop the students communicative skill at the UG level.

Part III – Core courses i.e. major courses that compulsorily required for each of the programme of study (CC), Ability Enhancement Course (AHC), Discipline Specific Elective Course (DSE) and Skill Enhancement Course (SEC).

For each course, credit is assigned based on the following:

Contact hour per week CREDITS

1 Lecture hour - 1 Credit

1 Tutorial hour - 1 Credit

2 Practical hours - 1 Credit

(Laboratory / Seminar / Project Work / etc.)

7. REQUIREMENTS FOR PROCEEDING TO SUBSEQUENT SEMESTER

7.1. **Eligibility:** Students shall be eligible to go to subsequent semester only if they earn sufficient attendance as prescribed therefor by the Board of Management from time to time.

7.2. **Attendance:** All Students must earn 75% and above of attendance for appearing for the University Examination. (Theory/Practical)

7.3. **Condonation of shortage of attendance:** If a Student fails to earn the minimum attendance (Percentage stipulated), the HODs shall condone the shortage of attendance on medical grounds up to a maximum limit of 10% (i.e. between 65% and above and less than 75%) after paying the prescribed fee towards the condonation of shortage of attendance. The students with attendance of less than 65 and more than 50% shall be condoned by VC on the recommendation of HODs on genuine grounds, will be permitted to appear for the

regular examination on payment of the prescribed condonation fee.

7.4. Detained students for want of attendance: Students who have earned less than 50% of attendance shall be permitted to proceed to the next semester and to complete the Program of study. Such Students shall have to repeat the semester, which they have missed by rejoining after completion of final semester of the course, by paying the fee for the break of study as prescribed by the University from time to time.

7.5. Transfer of Students and Credits: The strength of the credits system is that it permits inter Institutional transfer of students. By providing mobility, it enables individual students to develop their capabilities fully by permitting them to move from one Institution to another in accordance with their aptitude and abilities.

7.5.1. Transfer of Students is permitted from one Institution to another Institution for the same program with same nomenclature, provided, there is a vacancy in the respective program of Study in the Institution where the transfer is requested.

7.5.2. The marks obtained in the courses will be converted into appropriate grades as per the University norms.

7.5.3. The transfer students are not eligible for Ranking, Prizes and Medals.

7.5.4. Students who want to go to foreign Universities upto two semesters or Project Work with the prior approval of the Departmental / University Committee are allowed to transfer of their credits. Marks obtain in the courses will be converted into Grades as per the University norms and the students are eligible to get CGPA and Classification.

8. EXAMINATION AND EVALUATION

8.1. Examination:

8.1.1 There shall be examinations at the end of each semester, for odd semesters in the month of October / November, for even semesters in April / May. A candidate who does not pass the examination in any course(s) shall be permitted to appear in such failed courses in the subsequent examinations to be held in October / November or April / May.

8.1.2 A candidate should get registered for the first semester examination. If registration is not possible owing to shortage of attendance beyond condonation limit / regulations prescribed OR belated joining OR on medical grounds, the candidates are permitted to move to the next semester. Such candidates shall re-do the missed semester after completion of the programme.

8.1.3 The results of all the examinations will be published through University Website. In the case of passed out candidates, their arrear results, will be published through University Website.

8.2 To Register For All Subjects:

Students shall be permitted to proceed from the First Semester up to Final Semester irrespective of their failure in any of the Semester Examination, except for the shortage of

attendance programs. For this purpose, Students shall register for all the arrear subjects of earlier semesters along with the current (subsequent) Semester Subjects.

8.3. Marks for Continuous Internal Assessment (CIA) Examinations and End Semester

Examinations (ESE) for PART I, II, III

8.3.1 There shall be no passing minimum for Continuous Internal Assessment (CIA) Examinations.

8.3.2 For End Semester examination, passing minimum shall be 40% (Forty Percentage) of the maximum marks prescribed for the Course/Practical/Project and Viva-Voce.

8.3.3 In the aggregate (CIA and ESE) the passing minimum shall be of 40%.

8.3.4. He/She shall be declared to have passed the whole examination, if he/she passes in all the courses wherever prescribed in the curriculum by earning 140 CREDITS in Part I, II, III.

9. QUESTION PAPER PATTERN FOR END SEMESTER EXAMINATION

SECTION – A 10 questions 10 X 2 = 20 Marks

SECTION – B 5 questions either or pattern X 16 = 80 Marks

Total 100 Marks

10. SUPPLEMENTARY EXAMINATION: Supplementary Examinations are conducted for the students who appeared in the final semester examinations. Eligible criteria for appearing in the Supplementary Examinations are as follows:

10.1. Eligibility: A Student who is having a maximum of two arrear papers is eligible to appear for the Supplementary Examination.

10.2. Non-eligibility for those completed the program: Students who have completed their Program duration but having arrears are not eligible to appear for Supplementary Examinations.

11. RETOTALLING, REVALUATION AND PHOTOCOPY OF THE ANSWER SCRIPTS:

11.1. Re-totalling: All UG Students who appeared for their Semester Examinations are eligible for applying for re-totalling of their answer scripts.

11.2. Revaluation: All current batch Students who have appeared for their Semester Examinations are eligible for Revaluation of their answer scripts. Passed out candidates are not eligible for Revaluation.

11.3. Photocopy of the answer scripts: Students who have applied for revaluation can download their answer scripts from the University Website after fifteen days from the date of publication of the results.

12. THE EXAMINATION AND EVALUATION FOR MOOCS will be as per the requirements of the regulatory bodies and will be specified at the beginning of the Semester and notified by the university NPTEL-SWAYAM Coordinator (SPOC).

13. CLASSIFICATION OF SUCCESSFUL STUDENTS

13.1. Part I Tamil / Other Languages; Part II English And Part III Core Subjects, Allied, Electives Courses And Project: Successful Students passing the Examinations for the Part I, Part II and Part III courses and securing the marks

- a) CGPA 9.00 to 10.00 shall be declared to have passed the examination in **First class with Outstanding**.
- b) CGPA 7.50 to 8.99 shall be declared to have passed the examination in **First class with distinction**.
- c) CGPA 6.00 to 7.49 shall be declared to have passed the examination in **First Class**.
- d) CGPA 5.00 to 5.99 in the aggregate shall be declared to have passed the examination in the **SECOND** Class.
- e) CGPA 4.00 to 4.99 shall be declared to have passed the examination in the **THIRD** Class.

14. MARKS AND GRADES: The following table shows the marks, grade points, letter grades and classification to indicate the performance of the Student:

14.1. Computation of Grade Point Average (GPA) in a Semester, Cumulative Grade Point Average (CGPA) and Classification

GPA for a Semester: = $\sum_i C_i G_i \div \sum_i C_i$ That is, GPA is the sum of the multiplication of grade points by the credits of the courses divided by the sum of the credits of the courses in a semester.

Where, C_i = Credits earned for course i in any semester,

G_i = Grade Points obtained for course i in any semester

n = Semester in which such courses were credited.

CGPA for the entire programme: = $\sum_n \sum_i C_{ni} G_{ni} \div \sum_n \sum_i C_{ni}$ That is, CGPA is the sum of the multiplication of grade points by the credits of the entire programme divided by the sum of the credits of the courses of the entire programme

Grade Conversion Table – UG			
Range of Marks	Grade Points	Letter Grade	Description
90 – 100	10	O	Outstanding
82 – 89	9	A+	Excellent
75 – 81	8	A	Very Good
67 – 74	7	B+	Good
60 – 66	6	B	Above Average
50 – 59	5	C	Average
40 – 49	4	D	Minimum for pass
0 – 39	0	RA	Reappear
		AAA	Absent

14.2. Letter Grade and Class CGPA

Overall Performance – UG		
CGPA	GRADE	CLASS
4.00 - 4.99	D	Third Class
5.00 - 5.99	C	Second Class
6.00 - 6.69	B	First Class
6.70 - 7.49	B+	
7.50 - 8.19	A	First Class with Distinction*

8.20 - 8.99	A+	
9.00 - 10.00	O	First Class - Outstanding*

- The Students who have passed in the first appearance and within the prescribed semester of the UG Programme (Major, Allied and Elective courses only) are eligible.

15.RANKING

- 15.1 Students who pass all the examinations prescribed for the Program in the **FIRST APPEARANCE ITSELF ALONE** are eligible for Ranking / Distinction.
- 15.2 In the case of Students who pass all the examinations prescribed for the Program with a break in the First Appearance are only eligible for Classification.
- 15.3 Students qualifying during the extended period shall not be eligible for RANKING.

16. MAXIMUM PERIOD FOR COMPLETION OF THE PROGRAMS TO QUALIFY FOR A DEGREE

- 16.1. A Student who for whatever reasons is not able to complete the programs within the normal period (N) or the Minimum duration prescribed for the programme, may be allowed two years period beyond the normal period to clear the backlog to be qualified for the degree. (Time Span = N + 2 years for the completion of programme)
- 16.2. In exceptional cases like major accidents and child birth an extension of one year considered beyond maximum span of time (Time Span=N + 2 + 1 years for the completion of programme).

17. REVISION OF REGULATIONS, CURRICULUM AND SYLLABI

The University may from time to time revise, amend or change the Regulations, Curriculum, Syllabus and Scheme of examinations through the Academic Council with the approval of the Board of Management.

Vels Institute of Science and Technology and Advanced studies (VISTAS)

BCA DEGREE

Courses of Study and Scheme of Assessment

Total No of Credits: 140

BCA Course Components

Component	I Sem	II Sem	III Sem	IV Sem	V Sem	VI Sem	Total Credits
Core Courses & Languages	17 +6	17+6	21	18	5	-	90
Ability Enhancement Courses (AEC)	2	-	2	-	-	-	4
Discipline Specific Elective(DSE)&Generic Elective(GEC)	-	-	-	-	16	10+3	29

Skill enhancement Course(SEC)	-	2	2	3	2	5(DE)+3	17
Total Credits	25	25	25	21	23	21	140

**Learning Outcomes-Based Curriculum Framework
Undergraduate Education
B.C.A**

1. Introduction

The Learning Outcomes-Based Curriculum Framework (LOCF) for the undergraduate programs like B.C.A is intended to provide a broad framework to create an academic base that responds to the need of the students to understand the basics of B.C.A.

The IT industry is growing rapidly and hence the demand for BCA graduates is increasing every passing day. The Bachelor of Computer Applications (BCA) is an undergraduate program which is three-year program that span six semesters. It is designed to bridge the gap between the studies of computers and its applications. This program aims to shape computer professionals with the right moral and ethical values and can prepare students to face the challenges and opportunities in IT industries by building strong foundations. The syllabus focuses on the core fundamentals of computer science, but generally undergoes revision according to the industry requirement with the aim of increasing employment opportunities for students. After obtaining a BCA degree, students can find well-paid job opportunities in leading IT companies. The roles that one can bag after completing a BCA programme is that of a System engineer, software tester,

junior programmer, web developer, system administrator, software developer, etc. BCA graduates are not only recruited by the private sector but also by public sector. Government organizations like Indian Air Force(IAF), Indian Army, and India Navy hire a large bunch of computer professionals for their IT department.

2. Learning Outcomes Based Approach To Curriculum Planning

2.1 Nature and extent of UG program in B.C.A:

The UG programs in B.C.A builds on the basic Computer Science taught at the +2 level in all the schools in the country. Ideally, the +2 senior secondary school education should aim and achieve a sound knowledge of computer and with sufficient programming knowledge. The curriculum and syllabus should be framed in such way to ignite the young minds of the students to have the urge to innovate and create new approaches for succeeding in IT industry.

2.2 Aims of UG program in B.C.A

The mission is to emerge as a worldwide Conglomerate of premier educational establishment for B.C.A, all taking pride in having nurtured data that may result in fulfil the aspirations of IT industries and therefore the Individual.

The primary objective of this program is to produce a foundation of computing principles and business practices for effectively managing information systems and enterprise software package. It helps students to analyze the necessities for system development and exposes students to business software package and information systems. This course provides students with choices to concentrate on application software, system software or mobile applications.

Commit our-self to a mission to stand out in analysis and to form an environment of effective learning, generate a spirit of questioning, enquiry, induce healthy challenges and aggressiveness, feel of complete accomplishment and instinct authority.

3. Graduate attributes in B.C.A

Some of the characteristic attributes of a graduate in B.C.A

- ❖ Communication Skills
- ❖ Disciplinary knowledge

- ❖ Critical thinking
- ❖ Analytical reasoning
- ❖ Problem solving
- ❖ Reflective thinking
- ❖ Leadership qualities
- ❖ Scientific reasoning
- ❖ digital literacy
- ❖ Team work
- ❖ Skilled project manager
- ❖ Ethical awareness / reasoning
- ❖ Lifelong learners
- ❖ Self-directed learning

4. Programme learning outcomes relating to B.C.A

4.1 Programme Outcome

PO1: Critical Thinking: Apply knowledge of Computer Science to identify, analyze, problems and to provide effective solution in the area of Computing.

PO2: Computing Skills and Ethics: Analyze a problem, and identify and define the computing requirements appropriate to its solution.

PO3: Analytical skill: Ability to design, develop algorithms and provide software solutions to cater the industrial needs.

PO4: Modern Tool Usage: Use current techniques, skills, and tools necessary for computing practices

PO5: Employability Skills: Inculcate skills to excel in the fields of Information Technology and its Enabled services, Government and Private sectors, Teaching and Research.

PO6: Ethics: Insists ethical responsibilities, human and professional values and make their contribution to the society.

PO7: Self Directed and Life-long Learning: Engaged in lifelong learning to equip them to the changing environment and be prepared to take-up mastering programmes.

4.2 Programme Specific Outcome

PSO1: Understand the basic concepts in computer.

PSO2: An ability to apply knowledge of mathematics, computer science and management in practice.

PSO3: An ability to enhance not only comprehensive understanding of the theory but its application too in diverse field

PSO4: Analyze and apply the latest technologies to solve problems in the areas of computer applications.

PSO5: Apply technical and professional skills to excel in business.

PSO6: Able to build software applications and tools through quantitative and qualitative techniques.

PSO7: Able to design a computing system to meet desired needs within realistic constraints such as safety, security and applicability in multidisciplinary teams with positive attitude.

PSO8: Develop practical skills to provide solutions to industry, society and business

PSO9: Able to communicate effectively in both verbal and written form.

5. Degree of Bachelor Of Computer Applications

5.1 Duration Of the Programme

- ❖ Three years (six semesters)
- ❖ Each academic year shall be divided into two semesters. The odd semesters includes the period from July to November and the even semesters from January to May of each year.
- ❖ There shall not be less than 90 working days for each semester.

5.2. Eligibility for Admission

Students should have passed the Higher Secondary Examinations of (10+2) stream with **Computer Science/Mathematics/Business Maths** as one of the subjects or any examination of any other authority accepted by the Board of Management of VISTAS.

5.3. Credit Requirments And Eligibility For Award Of Degree

A Candidate shall be eligible for the award of the Degree only if he/she has undergone the prescribed course of study in a College affiliated to the University for a period of not less than three academic years and passed the examinations of all the Six Semesters prescribed earning a minimum of 140 credits as per the distribution given in for Part I, II, III, IV & V and also fulfilled such other conditions as have been prescribed thereof.

5.4. Course Of Study, Credits And Scheme Of Examination

The Course Components and Credit Distribution shall consist Part I, II & III:

(Minimum number of Credits to be obtained)

Credit Assignment Each course is assigned certain number of credits based on the following:

Contact period per week CREDITS

1 Lecture Period - 1 Credit

1 Tutorial Period - 1 Credit

2 Practical Periods - 1 Credit

(Laboratory / Seminar / Project Work / etc.)

5.5. Requirements For Proceeding To Subsequent Semester

- ❖ **Eligibility:** Students shall be eligible to go to subsequent semester only if they earn sufficient attendance as prescribed by the Board of Management from time to time.
- ❖ **Attendance:** All Students must earn 75% and above of attendance for appearing for the University Examination. (Theory/Practical)
- ❖ **Condonation of shortage of attendance:** If a Student fails to earn the minimum attendance (Percentage stipulated), the HODs shall condone the shortage of attendance up to a maximum limit of 10% (i.e. between 65% and above and less than 75%) after collecting the prescribed fee towards the condonation of shortage of attendance. Such fees collected and should be remitted to the University.
- ❖ **Non-eligibility for condonation of shortage of attendance:** Students who have secured less than 65 % but more than 50 % of attendance are NOT ELIGIBLE for condonation of shortage of attendance and such Students will not be permitted to appear for the regular examination, but will be allowed to proceed to the next year/next semester of the program
- ❖ **Detained students for want of attendance:** Students who have earned less than 50% of attendance shall be permitted to proceed to the next semester and to complete the Program of study. Such Students shall have to repeat the semester, which they have missed by rejoining after completion of final semester of the course, by paying the fee for the break of study as prescribed by the University from time to time.
- ❖ **Condonation of shortage of attendance for married women students:** In respect of married women students undergoing UG programs, the minimum attendance for condonation (Theory/Practical) shall be relaxed and prescribed as 55% instead of 65% if they conceive during their academic career. Medical certificate from the Doctor together

with the attendance details shall be forwarded to the university to consider the condonation of attendance mentioning the category.

- ❖ **Zero Percent (0%) Attendance:** The Students, who have earned 0% of attendance, have to repeat the program (by rejoining) without proceeding to succeeding semester and they have to obtain prior permission from the University immediately to rejoin the program.
- ❖ **Transfer of Students and Credits:** The strength of the credits system is that it permits inter Institutional transfer of students. By providing mobility, it enables individual students to develop their capabilities fully by permitting them to move from one Institution to another in accordance with their aptitude and abilities.
- ❖ Transfer of Students is permitted from one Institution to another Institution for the same program with same nomenclature. Provided, there is a vacancy in the respective program of Study in the Institution where the transfer is requested. Provided the Student should have passed all the courses in the Institution from where the transfer is requested.
- ❖ The marks obtained in the courses will be converted and grades will be assigned as per the University norms.
- ❖ The transfer students are not eligible for classification.
- ❖ The transfer students are not eligible for Ranking, Prizes and Medals.
- ❖ Students who want to go to foreign Universities up to two semesters or Project Work with the prior approval of the Departmental/College Committee are allowed to get transfer of credits and marks which will be converted into Grades as per the University norms and are eligible to get CGPA and Classification; they are not eligible for Ranking, Prizes and Medals.

5.6.Examination and Evaluation

- ❖ Register for all subjects: Students shall be permitted to proceed from the First Semester up to Final Semester irrespective of their failure in any of the Semester Examination. For this purpose, Students shall register for all the arrear subjects of earlier semesters along with the current (subsequent) Semester Subjects.
- ❖ Marks for Internal and End Semester Examinations for PART I, II, III
- ❖ There shall be no passing minimum for Internal.

- ❖ For external examination, passing minimum shall be 40% [Forty Percentage] of the maximum marks prescribed for the paper for each Paper/Practical/Project and Viva-Voce.
- ❖ In the aggregate [External/Internal] the passing minimum shall be of 40%.
- ❖ He / She shall be declared to have passed the whole examination, if he/she passes in all the papers and practical wherever prescribed as per the scheme of the examinations by earning 140 CREDITS in Part I, II, III.

5.7. Maximum Period For Completion Of The Programs To Qualify For A Degree

- ❖ A Student who for whatever reasons is not able to complete the programs within the normal period (N) or the Minimum duration prescribed for the programme, may be allowed two years period beyond the normal period to clear the backlog to be qualified for the degree. (Time Span = N + 2 years for the completion of programme)

5.8. Revision Of Regulations, Curriculum And Syllabi

- ❖ The University may from time to time revise, amend or change the Regulations, Curriculum, Syllabus and Scheme of examinations through the Academic Council with the approval of the Board of Management.

VELS INSTITUTE OF SCIENCE, TECHNOLOGY AND ADVANCED STUDIES (VISTAS)

BCA DEGREE COURSE

COURSES OF STUDY AND SCHEME OF ASSESSMENT

TOTAL NO OF CREDITS: 140

Code No.	Course	Hours/Week			Credits	Maximum Marks		
		Lecture	Tutorial	Practical		CA	SEE	Total
SEMESTER 1								
LANG	Tamil I/ Hindi / French	3	0	0	3	40	60	100
ENG	English I	3	0	0	3	40	60	100
CORE1	Programming in C	4	1	0	5	40	60	100
CORE2	Web Technology	4	0	0	4	40	60	100
CORE3	Mathematics I	4	0	0	4	40	60	100
CORE PRAC	Programming in C Lab	0	0	4	2	40	60	100
CORE PRAC	Web Technology Lab	0	0	4	2	40	60	100

AECC	Communication Skills	1	0	2	2	40	60	100
SEC	Orientation/Induction programme / Life skills	-	-	-	-	-	-	-
		19	1	10	25			

SEMESTER 2

LANG	Tamil II / Hindi / French	3	0	0	3	40	60	100
ENG	English II	3	0	0	3	40	60	100
CORE4	Programming in C++	4	1	0	5	40	60	100
CORE5	RDBMS	4	0	0	4	40	60	100
CORE6	Mathematics – II	4	0	0	4	40	60	100
CORE PRAC	Programming in C++ Lab	0	0	4	2	40	60	100
CORE	RDBMS Lab	0	0	4	2	40	60	100
SEC	Soft Skills – I/ Sector Skill Council Course	2	0	0	2	40	60	100
SEC	NSS / NCC / Swachh Bharat / Inplant Training	-	-	-	-	-	-	-
		20	1	8	25			

CA - Continuous Assessment

SEE - Semester End Examination

VELS INSTITUTE OF SCIENCE, TECHNOLOGY AND ADVANCED STUDIES

BCA DEGREE COURSE

Code No.	Course	Hours/Week		Maximum Marks		CA	SEE	Total
		Lecture	Tutorial	Practical	Credits			
CORE7	Programming in JAVA	4	1	0	5	40	60	100
CORE 8	Open Source Technologies	4	0	0	4	40	60	100
CORE 9	Data Structures	4	0	0	4	40	60	100
CORE 10	Financial Accounting	4	0	0	4	40	60	100
AECC	Environmental Studies	2	0	0	2	40	60	100
CORE PRAC	Programming in Java Lab	0	0	4	2	40	60	100
CORE PRAC	Open Source Technologies Lab	0	0	4	2	40	60	100
SEC	Soft Skills - II / Sector Skill Council Course	2	0	0	2	40	60	100

SEC	Swayam / NPTEL / Value Added Course	-	-	-	-	-	-	-
		20	1	8	25			

SEMESTER 4

CORE 11	Python Programming	4	1	0	5	40	60	100
CORE 12	Operating System	4	0	0	4	40	60	100
CORE 13	Statistical & Numerical Methods	5	0	0	5	40	60	100
CORE PRAC	Python Programming lab	0	0	4	2	40	60	100
CORE PRAC	Unix Lab	0	0	4	2	40	60	100
SEC	Soft Skills III / Sector Skill Council Course	2	0	0	2	40	60	100
SEC	Internship / Capability Enhancement Programme	0	0	2	1	-	-	-
		15	1	10	21			

CA - Continuous Assessment

SEE - Semester End Examination

VELS INSTITUTE OF SCIENCE, TECHNOLOGY AND ADVANCED STUDIES

BCA DEGREE COURSE

Code No.	Course	Hour / Week		Maximum Marks			Total			
		Lecture	Tutorial	Practical	Credits	CA		SEE		
CORE14	Data Communication & Networks 4			1	0	5	40	60	100	
DSE 1	Discipline Specific Elective - I			3	0	0	3	40	60	100
DSE 2	Discipline Specific Elective – II			3	0	0	3	40	60	100
DSE 3	Discipline Specific Elective - III			3	0	0	3	40	60	100
DSE 4	Discipline Specific Elective – IV			3	0	0	3	40	60	100
DSELAB	Software Testing Lab			0	0	4	2	40	60	100
DSE LAB	Mobile App Lab			0	0	4	2	40	60	100
SEC	Internship / Mini Project / Sector Skill Council Course			0	0	4	2	40	60	100

SEC	Skill Enhancement Training / Student Club Activities	-	-	-	-	-	-	-
		16	1	12	23			
SEMESTER 6								
DSE 5	Discipline Specific Elective – V	3	0	0	3	40	60	100
DSE 6	Discipline Specific Elective - VI	3	0	0	3	40	60	100
DSE 7	Discipline Specific Elective - VII	3	0	2	4	40	60	100
DSE/ GE	Generic Elective - I	3	0	0	3	40	60	100
SEC	Entrepreneurship Development	2	0	0	2	40	60	100
DE	Project Work	0	0	10	5	40	60	100
SEC	Technical Seminar / Innovation Council / Start up Initiative	0	0	2	1	40	60	100
		14	0	14	21			

CA - Continuous Assessment

SEE - Semester End Examination

UGC Recommended Generic Electives

1. Consumer Affairs 2. Disaster Management 3. Universal Human Values

LIST OF DISCIPLINE SPECIFIC ELECTIVE COURSES

DSE – 1	Digital Logic Fundamentals Introduction to Information technology Computer Architecture
DSE – 2	Data Mining Introduction to Data Science Mobile App Development
DSE -3	Operations Research Compiler Design Machine Learning
DSE – 4	Block Chain Technology Software testing

	Introduction to Cloud Computing
DSE – 5	Big Data Analytics Microprocessor & its Applications E-Commerce
DSE – 6	Software Engineering Artificial Intelligence IOT & its Application
DSE –7	DOT NET Programming Natural Language Processing Digital Image Processing

LIST OF GENERIC ELECTIVE COURSES

GE	Web designing
	Internet Basics
	MYSQL

LIST OF SKILL ENHANCEMENT COURSES

SEC	Soft skill-I
	Soft skill-II
	NSS
	Ethics and Values
	Ethical Hacking
	Matlab Programming

**LIST OF ABILITY ENHANCEMENT COMPULSORY
COURSE**

AECC	Communication Skill
	Environmental Studies

CORE COURSES

I SEMESTER

I SEM LANG

HINDI – I

3 0 0 3

COURSE OBJECTIVE: Skill Development

- To enable the students to develop communication skills
- To train students in official language
- To enrich their knowledge in Hindi literature

Unit I	- 'Ek atuut kadi', letter writing, Technical words.	9
Unit II	'Devi singh' , letter writing, Technical words.	9
Unit III	' kabiraa ki kaashi ', letter writing, Technical words.	9
Unit IV	' kabiraa ki kaashi ', letter writing, Technical words.	9
Unit V	' bharathiya vigyan ki kahaani '- 'hamne diyaa ,hamne liyaa' , letter writing	9

Total No of Hours :45

COURSE OUTCOME

At the end of this course

- CO 1 Students will be familiar with official letter writing
CO 2 will be trained in writing various letters.
CO 3 students will be moulded with good character understand human values
CO 4 students will gain knowledge about ancient India
CO 5 will know the equivalent hindi words for scientific terms

TEXT BOOK

Gadya Khosh , Prashasanik shabdavali, Patra lekhan

I SEM 21LFR001

FRENCH I

3 0 0 3

COURSE OBJECTIVE: Skill Development

To introduce French language.

To enable the students to understand and to acquire the basic knowledge of French language with elementary grammar.

UNIT:I INTRODUCTION

09

Introduction-Alphabet-comment prononcer, écrire et lire les mots-base: les prénoms personnel de 1er , 2eme et 3eme personnes-conjugaisons les verbes être et avoir en forme affirmative, négative

Et interrogative.

UNIT II- LECON 1-3

09

Leçon 1 :Premiers mots en français- 2.Les hommes sont difficiles 3.Vive la liberté-Réponses aux questions tires de la leçon-Grammaire: Les adjectives masculines ou féminines-Les article définies et indéfinis-Singuliers et pluriels.

UNIT III-LECON 4-6

09

Leçons 4. L'heure c'est l'heure 5.Elle va revoir sa Normandie 6.Mettez-vous d'accord groupe de nom-Réponses aux questions tires de la leçon-Grammaire :A placer et accorder l'adjectif en groupe de nom-Préposition de lieu-A écrire les nombres et l'heure en français

UNIT :IV-LECON 7-9

09

Leçon 7.Trois visage de l'aventure , 8. A moi Auvergne 9.Recit de voyage-Réponses aux questions tires de la leçon- Grammaire : Adjectif processif- Les phrases au présent de l'indicatif-Les phrases avec les verbes pronominaux au présent.

UNIT :V- COMPOSITION :

09

A écrire une lettre a un ami l'invitant a une célébration différente ex :mariage-A faire le dialogue- A lire le passage et répondre aux questions.

Total No of Hours : 45

TEXTBOOK :

Jack GIRARDER & Jean Marie GRIDLIG, <<Méthode de Français PANORAMA>>, Clé Internationale, Goyal Publication ,New Delhi Edition 2014.

REFERENCE BOOKS:

DONDO Mathurin, “Modern French Course”, Oxford University Press, New Delhi Edition 2014.

Nithya Vijayakumar get ready French grammar-Elementary Goyal publications ,New Delhi Edition 2014.

I SEM LANG ENGLISH I–PROSE

3 0 0 3

COURSE OBJECTIVE:

- To enable students to develop their **communication skills** effectively. To make students familiar with **usage skills** in English Language.
- To enrich their vocabulary in English
- To develop communicative competency.

Credit Hours

UNIT I	09
1. Dangers of Drug Abuse - Hardin B Jones	
2. Tight Corners - E. V. Lucas	
UNIT II	09
3. Futurology - Aldous Huxley	
4. If You are Wrong, Admit it - Dale Breckenridge Carnegie	
UNIT III	09
5. Industry - Dr.M.Narayana Rao & Dr.B.G.Barki	
6. Turning Point of My Life - A.J Cronin	
UNIT IV	09
7. Excitement - Mack R. Douglas	
8. The Kanda Man Eater - Jim Corbett	
UNIT V	09
9. Vocabulary and Exercises under the Lessons	

Total No of Hours:45Hours

COURSE OUTCOME

- At the end of this course students will be able to,
- CO1 Examine the language of prose.
 - CO2 Utilize instructions on fundamentals of grammar
 - CO3 Develop their own style of writing after studying diverse prose essays.
 - CO4 Classify different essays on the basis of their types.
 - CO5 Critically comment on the textual content of prose.

TEXT BOOKS

- English for Communication Enrichment: by Jeya Santhi June 2015.
- Dr. M. Narayana Rao and Dr. B. G. Barki – Anu’s Current English for Communication (AnuChitra). June 2012.
- Dr. Ananthan , R. Effective Communication. Ed. Chennai : Anu Chithra Pub.2010.

WEB SOURCES:

- <https://www.gradesaver.com/>
- <https://www.enotes.com/>
- <https://www.jstor.org/>
- <https://www.sparknotes.com/>
- <https://www.cliffsnotes.com/>

COURSE OBJECTIVE employability

- To introduces the basic concepts of programming in C.
- To understand the logic of a problem and write structured C programs.
- To deal the concept of functions in C languages.
- To demonstrate an understanding of primitive data types, values, operators and expressions in C.
- To improve the students with quality of employability.

UNIT I INTRODUCTION**15**

Fundamental character set – Identifier and keywords – data types – Constants –variables – Declarations – Expressions – Statements – Arithmetic, Unary, Relational andlogical, Assignment and conditional Operators – Library Functions.

UNIT II INPUT, OUTPUT FUNCTIONS AND CONTROL STRUCTURES**15**

Data input output functions – Simple C programs – Flow of control – if, if-else, while,do-while, for loop, Nested control structures – Switch, Break and continue, go-tostatements – Comma operator.

UNIT III FUNCTIONS AND STORAGE CLASSES**15**

Functions – Definition – Proto-types – Passing arguments – Recursions – storage Classes– Automatic, External, Static, Register Variable – Multi-file programs.

UNIT IV ARRAYS, STRINGS, STRUCTURE AND UNION**15**

Arrays – defining and Processing – Passing arrays to functions – Multi-DimensionalArrays – Arrays and String. Structures – User defined data types – Passing structures tofunctions – self-referential structures – Unions – Bit wise operations.

UNIT V POINTERS AND FILES**15**

Pointers – Declarations – Passing pointers to functions – Operation in Pointers –Pointer and Arrays – Arrays and Pointers - Structures and Pointers – Files – Creating,Processing, Opening and Closing a data file.

Total No of Hrs: 75

COURSE OUTCOMES

On completion of this course,Students can able to,

CO1: Design simple applications using File, Pointers & Structures.

CO2: Create simple programs using Functions & Control Structures

CO3: Analyze the basic structure of C Language.

CO4: Apply the Concept of Input, Output Statements, Operators & expressions in C programs

CO5: Understand the basic tokens in C language.

CO6: Able to employ the concept with logical thinking.

TEXT BOOK

1.E. Balaguruswamy, Programming in ANSI C, TMH publishing CompanyLTD,2008.

REFERENCE BOOKS

1. H. Schildt, The Complete Reference, 4th Edition, TMH,2004.

2. Gottfried, B.S, Programming with C, fourth edition, TMH Pub.Co.Ltd, 2004.

3. Kanetkar Y, Let us C, BPB publications with ANSI & Turbo C, First edition, Pearson Education,New Delhi, 2008.

WEBSITES

1. www.w3schools.com
2. www.tutorialspoint.com
3. www.javapoint.com
4. www.geeksforgeeks.org

WEB SOURCES

1. https://www.vssut.ac.in/lecture_notes/lecture1424354156.pdf
2. https://www.unf.edu/~wkloster/2220/ppts/cprogramming_tutorial.pdf

COURSE OBJECTIVE employability

- To impart the knowledge of basic concepts and coding of HTML, Java script and CSS. This course elaborates internet related technologies to design a creative and dynamic website in a systematic way. To improve the quality of students with employability which is needed for internet society.

UNIT I HTML 12

Internet Basic – Introduction to HTML – PRE- List: Ordered and unordered- Creating Table – Linking document – How to work efficiently with images in web pages, image maps, GIF animation, adding multimedia -Frames -Graphics to HTML Doc – -Forms.

UNIT II STYLE SHEET 12

Sheet basics – Adding style to document – Creating style sheet rules – Why we use CSS- adding CSS to your web pages- Grouping styles – Style Sheet Types :Inline Style sheet – External Style Sheet-Import Style Sheet – Style Sheet Properties: Font , Text , Background & Color , Margin , Padding , Border & Box , Display.

UNIT III XML & DHTML 12

XML & DHTML: -extensible markup language (XML). Dynamic HTML: Document object model (DCOM)-Accessing HTML & CSS through DCOM Dynamic content styles & positioning-Event bubbling-data binding..

UNIT IV JAVASCRIPT 12

Introduction to JavaScript –Advantage of JavaScript – JavaScript syntax – Data type – Variable –Array – Operator and Expression – Looping Constructor – Function – Dialog box.- JavaScript document object model – Introduction – object in HTML – Event Handling – Window object – Document object – Browser Object – Form Object – Navigator object – Screen object –Build in object – User defined object – Cookies

UNIT V AJAX 12

Ajax: Introduction, advantages &disadvantages, Purpose of it, Ajax based web application, alternatives of Ajax Java Script & AJAX: Introduction to array-operators, making statements-date & time-mathematics-strings-Event handling-form properties. AJAX. Introduction to jQuery and AngularJS.

Total No of Hrs: 60

COURSE OUTCOME

On completion of this course, the students can able to,

- CO1: Create Static web sites using HTML & CSS.
- CO2: Design dynamic and interactive web pages by embedding Java Script.
- CO3: Analyze the usage different technologies such as XML & AJAX.
- CO4: Understand the concept of Cookies.
- CO5: Remember basic tags and Properties in HTML, CSS,Java Script,and XML&Ajax.
- CO6: Improve the design of web pages for employable skills

TEXT BOOKS

1. Bayross, Web Enable Commercial Application Development Using HTML, DHTML,JavaScript, Perl CGI, BPB Publications.
2. HTML Complete Reference.

REFERENCE BOOKS

1. Jaworski, Mastering JavaScript, BPB Publications, 2006
2. DT Editorial Services (Author), “HTML 5 Black Book (Covers CSS3, JavaScript, XML, XHTML, AJAX, PHP, jQuery)”, Paperback 2016, 2nd Edition.

WEBSITES

1. www.w3schools.com
2. www.tutorialspoint.com
3. www.javapoint.com
4. www.geeksforgeeks.org

WEB SOURCES

1. https://www.darshan.ac.in/Upload/DIET/Documents/CE/2160708_Web%20Technology%20Study%20Material%20GTU_23042016_032646AM.pdf
2. https://www.vssut.ac.in/lecture_notes/lecture1423183400.pdf
3. https://www.webstepbook.com/supplements/slides/ch10-ajax_xml.pdf
4. <https://www.lamsade.dauphine.fr/~mlampis/EAPPS/lec2/js-slides.pdf>

Course objective: **Skill Development** To develop the skills of the students in the areas of Algebra, Numerical methods Trigonometry and Calculus. The course will also serve as a prerequisite for post graduate and specialized studies and research. This course also help to **develop the skills** for solving mathematical problems.

UNIT – I ALGEBRA AND NUMERICAL METHODS 12

Algebra: Summation of series simple problems. Numerical Methods: Operators E, Δ, ∇ , difference tables -Newton's forward and backward interpolation formulae for equal intervals, **Lagrange's interpolation formula**.

UNIT- II MATRICES 12

Introduction-Basic operations-Symmetric-skew symmetric-Hermitian-Skew Hermitian –Unitary-orthogonal-Inverse of a matrix -**Solution of linear system(Cramer's rule)**- Finding the Eigen roots and Eigen vectors of a matrix-Cayley Hamilton theorem(without proof)

UNIT- III THEORY OF EQUATIONS 12

Polynomial equations with real coefficients, irrational roots, complex roots, symmetric functions of roots, transformation of equation by increasing or decreasing roots by a constant, reciprocal equation. **Newton's method** to find a root approximately - simple problems.

UNIT IV TRIGONOMETRY 12

Introduction- Expansions of $\sin n\theta$ and $\cos n\theta$ in a series of powers of $\sin\theta$ and $\cos\theta$ - Expansions of $\sin n\theta$, $\cos n\theta$, $\tan n\theta$ in a series of sines, cosines and tangents of multiples of " θ " - Expansions of $\sin\theta$, $\cos\theta$ and $\tan\theta$ in a series of powers of " θ " – **Hyperbolic and inverse hyperbolic functions** - Logarithms of complex numbers.

UNIT V DIFFERENTIAL CALCULUS 12

Differentiation-Successive differentiation, n^{th} derivatives, **Leibnitz theorem** (without proof) and applications, Jacobians, Curvature and radius of curvature in Cartesian co-ordinates, maxima and minima of functions of two variables.

Total No of Hours : 60 Hrs

COURSE OUTCOME:

On completion of this course, the students will be able to:

- CO1.** Evaluate the underlying assumptions of analysis tools and relations of Set Theory
- CO2.** Understand and discuss the applications of matrices and utilizes.
- CO3.** Discuss and **develop the skills** to use the limitations of Theory of equations
- CO4.** Understand the key terminology, concept tools and techniques used in trigonometry
- CO5.** Apply the maxima and minima in detailed ways and the applications of partial differential equations.

TEXT BOOKS

1. P. Kandaswamy and K.Thilagavathy, Allied Mathematics paper I, 1st Semester, S.Chand Publishing Pvt. Ltd. 1st Edition,2003.
2. S. Narayanan and T.K. Manickavasagam Pillai – Ancillary Mathematics, S. Viswanathan Printers, 1986, Chennai.

REFERENCE BOOKS

1. P.R. Vittal, Allied Mathematics, Margham Publications, 4th Edition 2009.
2. A. Singaravelu, Allied Mathematics, Meenakshi Agency, 2007.
3. P. Duraipandian and S.UdayaBaskaran, Allied Mathematics, Vol. I & II Muhil Publications, Chennai.

WEB SOURCES

1. https://books.google.co.in/books?id=4C4rDAAAQBAJ&printsec=frontcover&source=gs_bse_summary_r&cad=0#v=onepage&q&f=false
2. <https://ncert.nic.in/ncerts/l/keep203.pdf>
3. <http://www.universityofcalicut.info/SDE/VI%20Sem.%20B.Sc%20Maths%20-%20Additional%20Course%20in%20lie%20of%20Project%20-Theory%20of%20equations%20&%20fuzzy%20set.pdf>
4. <https://www.math.ust.hk/~machas/numerical-methods.pdf>
5. https://www.researchgate.net/publication/321825504_Differential_Calculus

- To introduces to write programs using basic concepts of C programming.
- To practices the student to write simple programs using function.
- To improves the logical thinking in C programming.
- To **develop the skill** for coding

LIST OF EXPERIMENTS

1. Write a program in C to find whether the given string is Palindrome or not.
2. Write a program in C to count **vowels, consonants** etc.
3. Write a program in C to find the factorial of a number.
4. Write a program in C to find the given number is prime or not.
5. Write a program in C to find the value of **NPR**
6. Write a program in C to find the GCD of two numbers.
7. Write a program in C to find the **Fibonacci** Series
8. Write a program in C to find Matrix Addition/Subtraction.
9. Write a program in C to find Matrix Transpose.
10. Write a program in C for **swapping** 2 numbers.
11. Write a program in C to open, read and close the **file** ,
12. Write a program in C to read name and marks of n number of students and store them in a file.

Total No of Hrs: 30

COURSE OUTCOMES:

On completion of this course, Students can able to,

CO1: Design simple applications using File, Pointers & Structures.

CO2: Create simple programs using Control Structures

CO3: Develop C Programs using Array.

CO4: Develop C Programs using Functions.

CO5: Develop simple programs using operators & Expression.

CO6 : Able to **develop the skill** in program writing and debugging.

TEXT BOOK

1.E. Balaguruswamy, Programming in ANSI C, TMH publishing CompanyLTD,2008.

REFERENCE BOOKS

1. H. Schildt, The Complete Reference, 4th Edition, TMH,2004.
2. Gottfried, B.S, Programming with C, fourth edition, TMH Pub.Co.Ltd, 2004.
3. Kanetkar Y, Let us C, BPB publications with ANSI & Turbo C, First edition, Pearson Education,New Delhi, 2008.

WEBSITES

1. www.w3schools.com
2. www.tutorialspoint.com
3. www.javapoint.com
4. www.geeksforgeeks.org

WE SOURCES

1. https://www.vssut.ac.in/lecture_notes/lecture1424354156.pdf
2. https://www.unf.edu/~wkloster/2220/ppts/cprogramming_tutorial.pdf
3. http://mars.tekkom.dk/w/images/4/42/6272_cnote.pdf
4. <https://www.slideshare.net/gauravjuneja11/c-language-ppt>
5. <https://www.slideshare.net/avikdhupar/amazing-c>

COURSE OBJECTIVE Skill Development

To impart the knowledge of basic concepts and coding of HTML, Java script and CSS. This course elaborates internet related technologies to design a creative and dynamic website in a systematic way. To **develop the skill** for designing web pages and web sites.

LIST OF PROGRAMS

HTML

1. **Table** Handling
2. Designing Time Table
3. Designing an index of a book using ordered and unordered List
4. Designing an index of a book using Nesting of List
5. To scroll an **image** over a screen
6. Create a web page to link two or more pages.
7. Create a **web page** to advertise a product using Frames and Links
8. Create a Bio-data using Form tag.

CASCADING STYLE SHEET

1. Create an External Style Sheet using Font, Text and Color Properties
2. Create an **Internal Style Sheet** using Font, Text and Color Properties and Border Properties
3. Create an Inline Style Sheet using Font, Text , Color and Background Properties

JAVA SCRIPT

1. Simple Calculator
2. String Object
3. Array Object
4. Math Object
5. Screen Object
6. Navigator **Object**
7. Closing a window after a minute
8. **Working with OnMouseOver Event.**

Total No of Hrs: 30

COURSE OUTCOME

On completion of this course, the students can able to,

- CO1: Design Static web sites using HTML & CSS.
- CO2: Design dynamic and interactive web pages by embedding Java Script.
- CO3: Experiment the different technologies such as XML & AJAX.
- CO4: Implement and **develop the skill** to handle the Cookies.
- CO5: Describe the basic tags and Properties in HTML, CSS, Java Script, and XML & Ajax.

TEXT BOOKS

1. Bayross, Web Enable Commercial Application Development Using HTML, DHTML, JavaScript, Perl CGI, BPB Publications.
2. HTML Complete Reference.

REFERENCE BOOKS

1. Jaworski, Mastering JavaScript, BPB Publications, 2006
2. DT Editorial Services (Author), "HTML 5 Black Book (Covers CSS3, JavaScript, XML, XHTML, AJAX, PHP, jQuery)", Paperback 2016, 2nd Edition.

WEBSITES

1. www.w3schools.com
2. www.tutorialspoint.com
3. www.javapoint.com
4. www.geeksforgeeks.org

WEB SOURCES

1. https://www.darshan.ac.in/Upload/DIET/Documents/CE/2160708_Web%20Technology%20Study%20Material%20GTU_23042016_032646AM.pdf
2. https://www.vssut.ac.in/lecture_notes/lecture1423183400.pdf
3. https://www.webstepbook.com/supplements/slides/ch10-ajax_xml.pdf
4. <https://www.lamsade.dauphine.fr/~mlampis/EAPPS/lec2/js-slides.pdf>

Unit III - 'Pandit kouun (kahani) , Translation Practice	9
Unit IV - Rajani (<u>naatak</u>), Translation Practice	9
Unit V - Rajani (<u>naatak</u>), Translation Practice	9

**Total No OfHours
:45**

COURSE OUTCOME

At the end of this course

- CO 1 Students will know the importance & process of translation
- CO 2 They can develop the skill of translation
- CO 3 will know the different writing skills of authors
- CO 4 gain knowledge in hiindi literature
- CO 5 will acquire knowledge in hindi sahithya

TEXT BOOK : Gadya khosh

II SEM 21LFR002 FRENCH II 3 0 0
3

COURSE OBJECTIVE: Skill Development

- To fortify the grammar and vocabulary skills of the students.
- To enable the students have an idea of the French culture and civilization

UNIT:I LECON 10-11 09

Leçons :10 Les affaires marchent,11 un repas midi a problèmes- Réponses aux questions tires de la leçon-grammaire ;présent progressif passe récent ou future proche-complément

d'Object directe-complément d'objet

UNIT II- LECON 12-13 **09**

Leçons 12 :tout est bien qui fini bien,-13 aux armes citoyens-réponses aux questions tires de la leçon-grammaire :les pronoms<<en ou y>> rapporter des paroles-Les pronoms relatifs que, qui ou ou.

UNIT III-LECON 14-15 **09**

Leçons 14.Qui ne risque rien n'a rien-15.la fortune sourit aux audacieux-réponses aux questions tires de la leçon-grammaire : comparaison-les phrases au passe compose.

UNIT :IV-LECON 16-18 **09**

Leçons 16 la publicité et nos rêves 17 la France la monde 18 campagne publicitaire réponsesaux questions tires de la leçon-grammaire :les phrases a l'imparfait-les phrases au future

UNIT :V- COMPOSITION : **09**

A écrire une lettre de regret//refus a un ami concernant l'invitation d'une célébration reçue-a écrire un essaie sur un sujet générale-a lire le passage et répondre aux questions.

Total No of Hours : 45

TEXTBOOK :

Jack GIRARDER & Jean Marie GRIDLIG,<<Méthode de Français PANORAMA>>, Clé

Internationale, Goyal Publication ,New Delhi Edition 2014.

REFERENCE BOOKS:

DONDO Mathurin, "Modern French Course", Oxford University Press, New Delhi Edition

2014.Nithya Vijayakumar get ready French grammar-Elementary Goyal publications ,New Delhi, Edition 2014.

I SEM ENGLISH II **POETRY** **3 0 0 3**

COURSE OBJECTIVE **Skill Development**

To enable students to **develop** their **communication skills** effectively.

To enrich their vocabulary in English

To develop communicative competency.

Credit Hours

UNIT I

09

1. Growing Old - Winston Farewell
2. Ecology - A. K. Ramanujan

UNIT II

09

3. Stopping by Woods on a Snowy Evening - Robert Frost
4. Our Casuarina Tree - Toru Dutt

UNIT III

09

5. Goodbye Party for Miss Pushpa T.S. - Nissim Ezekiel
6. The Bull - Ralph Hodgson

UNIT IV

09

7. If - Rudyard Kipling
8. The Drowned Children - Louise Glück

UNIT V

09

9. Australia - A.D.Hope
10. A Far Cry from Africa - Derek Walcott

**Total No of Hours : 45
Hours**

COURSE OUTCOME

At the end of this course students will be able to,

CO1: Learn to employ Poetic expressions in the course of daily speech.

CO2: Prove their better communicative ability.

CO3: Prove their **skill** in writing sentences with poetic impact.

CO4: Develop different sensibilities in approaching life.

CO5: Solve life's problems as highlighted in the selections.

TEXT BOOKS

- Selections from Caribbean Literature. Mahaam Publishers, Chennai.
- Our Casuarina Tree - Vasan Publication By Dr.A Shanmugakani

WEB SOURCES

- <https://www.gradesaver.com/>
- <https://www.enotes.com/>
- <https://www.jstor.org/>
- <https://www.sparknotes.com/>
- <https://www.cliffsnotes.com/>

II SEM

PROGRAMMING IN C++

4 1 0 5

COURSE OBJECTIVES: employability

- This course introduces the basic concepts of programming in C++
- To improve the problem solving skills using OOPS concept for employability.
- On successful completion the students should have programming ability on C++

UNIT I PRINCIPLES OF OOP & BASICS OF C++ **15**

Procedure oriented programming – OOP paradigm - Basic concepts of OOP - **Benefits of OOP** -Applications of OOP - Basics of C++ - Tokens – Keywords – Identifiers and Constants – Data types – Variables - Operators – Expressions - Control Structures- Functions.

UNIT II CLASSES & OBJECTS **15**

General structure of Class & object – Defining member function – private member function – public member function – **Function Overloading** – Inline Function – Default Arguments – Static data members – **Static member functions**– Friend Function – Friend Class.

UNIT III CONSTRUCTOR & OVERLOADING **15**

Constructors – Types of Constructors – Overloading Constructors - Copy Constructors – **Destructors** - Arrays – Pointers – Operator Overloading – Overloading Unary Operator – Overloading Binary Operator – Rules For Overloading Operators – Type Conversions – **Command Line Arguments**

UNIT IV INHERITANCES & RUN TIME POLYMORHSIM **15**

Inheritance- Access specifiers – public derivation – private Derivation - Types of Inheritances - **Virtual Base Class** – virtual functions – pure virtual function

UNIT V STREAMS & FILES **15**

C++ Streams – **Stream Classes** – Unformatted I/O operations – Formatted I/O operations – Manipulators – **Exception Handling**.

Total No of Hours :

75

COURSE OUTCOMES:

On Completion of this course, the students can able to

CO1: Develop bottom up Programming using classes & objects.

CO2:Develop the file handling and error handling operations

CO3:Analyze the role of inheritance in building reusable code and I/O operations.

CO4:Apply the Concepts of Inline Function & Friend Function

CO5:Identify the basic concepts of Object Oriented Programming

TEXT BOOKS:

1. E.BalaGurusamy “Object Oriented Programming with C++”, Tata MC Graw Hill Education.
2. YashwantKanetkar-“Let Us C++”, 2ndedition,McGraw HillEducation,2000.

REFERENCE BOOKS:

1. Herbert Schildt “The Complete Reference C++”, 4th edition,McGraw Hill Education,2017
2. D.Ravichandran-“Oriented Programming with C++”, 2nd edition, TMH.

WEBSITES

- 1.www.w3schools.com
- 2.www.tutorialspoint.com
- 3.www.javapoint.com
4. www.geeksforgeeks.org

WEB SOURCES

1. https://www.tutorialspoint.com/cplusplus/cpp_tutorial.pdf
2. <https://www.cplusplus.com/files/tutorial.pdf>
3. <https://www.slideshare.net/aloknie/oop-cclassfinalppt>
4. <https://www.slideshare.net/adishesha12/basic-concept-of-oops>
5. <https://www.slideserve.com/joan-craft/object-oriented-programming-with-c>

SEM II
4

RDBMS

4 0 0

COURSE OBJECTIVE: employability

- To work on data, managing data between front end and back end and to create reports for employability..
- Provide for mass storage of relevant data.
- To employ and make access to the data easy for the user.

- Provide the prompt response to user requests from Relational Database.

UNIT I INTRODUCTION 12

Introduction to DBMS– Data and Information - Database – Database Management System – Objectives - Advantages – Components - **Architecture. ER Model**: Building blocks of ER Diagram –Relationship Degree – Classification – ER diagram to Tables – ISA relationship – **Constraints** – Aggregation and Composition – Advantages.

UNIT - II RELATIONAL MODEL 12

Relational Model: CODD’s Rule- Relational Data Model - Key - Integrity – Relational Algebra Operations – Advantages and limitations – Relational Calculus – Domain Relational Calculus - QBE.

UNIT - III RELATIONAL DATABASE STRUCTURE 12

Structure of Relational Database. Introduction to Relational Database Design - Objectives – Tools – Redundancy and Data Anomaly – **Functional Dependency** - **Normalization** – 1NF – 2NF – 3NF – BCNF. Transaction Processing – Database Security.

UNIT - IV QUERY BASICS 12

SQL: Commands – Data types – DDL - Selection, Projection, Join and Set Operations – Aggregate Functions – DML – Modification - Truncation - Constraints – Subquery.

UNIT - V PL/SQL 12

PL/SQL: Structure - Elements – Operators Precedence – Control Structure – Iterative Control - Cursors – **Procedure - Function - Packages – Exceptional Handling - Triggers.**

Total No of Hours:60 Hrs

COURSE OUTCOME

On Completion of this course, the students can able to

CO1: Develop the terminology, features, classifications, and characteristics embodied in Relational database systems

CO2: Develop skill on normalization theory and apply such knowledge to the normalization of Relational database.

CO3: Analyze relational algebra, solutions to a broad range of query problems

CO4: Apply create, populate, maintain, and query statements in the Relational database

CO5: Apply relational algebra, solutions to a broad range of query problems

TEXT BOOKS

1. G. V. Post - Database Management Systems Designing and Building Business Application - McGraw Hill International edition - 1999.
2. S. Sumathi, S. Esakkirajan, "Fundamentals of Relational Database Management System", Springer International Edition 2007.

REFERENCE BOOKS

1. Arun Majumdar & Pritimoy, "Database Management Systems" Bhattacharya, 2007, TMH.
2. Gerald V. Post, "Database Management Systems" 3rd edition, TMH.

WEBSITES

1. www.w3schools.com
2. www.tutorialspoint.com
3. www.javapoint.com
4. www.geeksforgeeks.org

WEB SOURCES

1. <http://www.rjspm.com/PDF/BCA-428%20Oracle.pdf>
2. https://www.vssut.ac.in/lecture_notes/lecture1423726199.pdf
3. <https://www.slideshare.net/WebStackAcademy/sql-rdbms-concepts>
4. <https://www.slideshare.net/MuhammadAdeel26/rdbms-59310206>
5. <https://slideplayer.com/slide/5770747/>

II SEM
4

MATHEMATICS -II

4 0 0

Course Objective : Skill Development

To impart the knowledge and skill of Integral calculus, Differential Equations, Fourier Series and Laplace transform. The course will also serve as a prerequisite for post graduate and specialized studies and research.

UNIT-I INTEGRAL CALCULUS

12

Integral calculus: Integration – Definite integrals – Bernoulli's formula -Reduction formula for $\int \sin^n x dx, \int \cos^n x dx, \int \tan^n x dx, \int x^n e^{ax} dx$.

UNIT-II DIFFERENTIAL EQUATIONS

12

Ordinary Differential Equations: First order of higher degree equations – Second order and non-homogenous linear differential equations with constant coefficient. Partial Differential

Equations: Formation of partial differential equations by eliminating arbitrary constants and arbitrary function- Solutions of four standard types of first order equation-Lagrange method of solving linear partial differential equation $Pp + Qq = R$

UNIT-III FOURIER SERIES **12**

Fourier series of periodic functions on the interval $[c, c+2\pi]$ –Even and Odd functions- Half range sine and cosine series.

UNIT-IV LAPLACE TRANSFORM **12**

Laplace transformation: Definition, Laplace transform of basic trigonometric, exponential and algebraic functions - Inverse Laplace transform- Solving differential equation of second order with constant coefficients using Laplace transform

UNIT – V VECTOR DIFFERENTIATION **12**

Introduction-Scalar point functions-Vector point functions-Vector differential operator ∇ , Gradient-Divergence-Curl-Solenoidal-irrotational-identities- Simple problems

Total No of Hours : 60 Hrs

COURSE OUTCOMES:

On completion of this course, the students will be able to:

- CO1.** Understand the key terminology, concept tools and techniques used in Integral calculus
- CO2.** Discuss the applications of differential equations.
- CO3.** Analyze the uses, limitations and applications of Fourier series
- CO4.** Evaluate Laplace transform and its applications
- CO5.** Understand the key terminology, concept tools and techniques used in Vector Differentiation.

TEXT BOOKS

1. P. Kandaswamy and K.Thilagavathy, Allied Mathematics paper II, 2nd Semester, S.Chand Publishing Pvt. Ltd. 1st Edition, 2004
2. S. Narayanan and T.K. Manickavasagam Pillai – Ancillary Mathematics, S. Viswanathan Printers, 1986, Chennai.

REFERENCE BOOKS:

5. P.R. Vittal, Allied Mathematics, Margham Publications, 4th Edition 2009.
6. A. Singaravelu, Allied Mathematics, Meenakshi Agency, 2007.

7. Write a C++ program to demonstrate Friend function
8. Write a C++ program to demonstrate Default Arguments
9. Write a C++ program to demonstrate Constructor
10. Write a C++ program to demonstrate Operator Overloading
11. Write a C++ program to demonstrate Single Inheritance
12. Write a C++ program to demonstrate Multi level Inheritance
13. Write a C++ program to demonstrate Multiple Inheritance
14. Write a C++ program to demonstrate virtual function
15. Write a C++ program to demonstrate pure virtual function

Total No of Hours : 30 Hrs

COURSE OUTCOMES:

On Completion of this course, the students can able to

CO1: Develop the Virtual Functions and File handling operations

CO2: Write C++ Programs using Classes & objects.

CO3: Build programs on Constructors, Destructors and Overloading concepts using programs.

CO4: Manipulate the role of inheritance in building reusable code and I/O operations.

CO5: State the OOP's concepts in writing simple C++ Programs.

TEXT BOOKS:

3. E.BalaGurusamy "Object Oriented Programming with C++", Tata MC Graw Hill Education.
4. YashwantKanetkar-"Let Us C++", 2nd edition, McGraw Hill Education, 2000.

REFERENCE BOOKS:

1. Herbert Schildt "The Complete Reference C++", 4th edition, McGraw Hill Education, 2017

2. D.Ravichandran-“Oriented Programming with C++”, 2nd edition, TMH.

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3. www.javapoint.com
4. www.geeksforgeeks.org

WEB SOURCES

1. https://www.tutorialspoint.com/cplusplus/cpp_tutorial.pdf
2. <https://www.cplusplus.com/files/tutorial.pdf>
3. <https://www.slideshare.net/aloknie/oop-cclassfinalppt>
4. <https://www.slideshare.net/adishesha12/basic-concept-of-oops>
5. <https://www.slideserve.com/joan-craft/object-oriented-programming-with-c>

SEM II	RDBMS LAB	0	0	4	2
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COURSE OBJECTIVE **Skill Development**

- This course gives **training skill** in design and implementation of data bases for the selected problems.
- To familiarize the participant with the nuances of database environments towards an information
- **skill** based data-processing oriented framework
- To give a good formal foundation on the relational model of data

LIST OF PROGRAMS

1. Table creation using constraints and perform insert, update, delete, select commands.
2. Exercise using drop, truncate, commit and rollback.
3. Exercise to implement sub queries.
4. Joins.
5. Logical Operator.
6. Aggregate functions.
7. String, Math and Date functions.
8. Examples for triggers.

9. Indexing.
10. Simple PL/SQL programs.
11. Cursor examples.
12. Nested queries.

Total No of Hours: 30 Hrs

COURSE OUTCOME

On Completion of this course, the students can able to

CO1:Build & Create Data manipulation, transaction control and data control using SQL COMMANDS.

CO2:Develop the procedures for backup & recovery and for the role of DBA

CO3:Analyze the efficiency of storing data using data clustering and partitioning .

CO4: Execute various DDL commands for creating data base design

CO5:.Execute the basic SQL queries using ORACLE database

TEXT BOOKS

1. G. V. Post - Database Management Systems Designing and Building Business Application - McGraw Hill International edition - 1999.
2. S. Sumathi, S. Esakkirajan, "Fundamentals of Relational Database Management System", Springer International Edition 2007.

REFERENCE BOOKS

1. ArunMajumdar&Pritimoy, "Database Management Systems" Bhattacharya, 2007, TMH.
2. Gerald V. Post, "Database Management Systems" 3rd edition, TMH.

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1. <http://www.rjspm.com/PDF/BCA-428%20Oracle.pdf>
2. https://www.vssut.ac.in/lecture_notes/lecture1423726199.pdf
3. <https://www.slideshare.net/WebStackAcademy/sql-rdbms-concepts>

4. <https://www.slideshare.net/MuhammadAdeel26/rdbms-59310206>
5. <https://slideplayer.com/slide/5770747/>

III SEMESTER R

COURSE OBJECTIVE**(EMPLOYABILITY)**

- To make students familiar with oops & applet programming
- Java programming can be used to develop both web based & console based application & stand-alone application
- Java is one of the top most languages used in most IT companies. It is a job assured course.

UNIT I INTRODUCTION TO JAVA 15

Introduction to Java – Features of Java – Object Oriented Concepts – Lexical Issues – Data Types – Variables – Arrays – Operators – Control Statements.

UNIT II CLASSES & OBJECTS 15

Classes – Objects – Constructors – Overloading methods – Static and fixed methods – Inner Classes – String Class – Inheritance – Overriding methods – Using super – Abstract class.

UNIT III PACKAGES 15

Packages – Access Protection – Importing packages – Exception Handling – Throw and Throws – Thread – Synchronizing – Runnable Interface – Multithreading.

UNIT IV INPUT/OUTPUT STREAMS 15

I/O streams – File Streams – Applets – Applet Life Cycle – String Buffer – Char Array – Java Utility classes – Calendar – Date – Random – Scanner – Timer – Vector.

UNIT V AWT 15

AWT - Working with windows using AWT Classes - AWT Controls - Layout Managers and Menus.

Total No of Hours: 75**COURSE OUTCOME****On Completion of this course, the students can able to**

CO1: Build Applet programs using AWT classes and utilize Controls and Layout Managers

CO2: Write a computer program to solve specified problems and use Java SDK Environment to create, debug and run simple java programs

CO3: Develop the Java Classes make use of Constructors and Inheritance

CO4: Analyze the packages and classify the thread communication

CO5: Describe java features and explain the supporting OOPs concepts

TEXT BOOKS

1. Cay S.Horstmann, Gary Cornell-Core Java 2 Volume 1 – Fundamentals,5th PHI,2000.
2. E.Balaguruswamy, ”Programming with JAVA”,3rd edition ,Tata McGraw- Hill Publications, 2007.

REFERENCE BOOKS

1. K.Arnold and J.Gosling- The Java Programming Language – Second Edition,Addison Wesley,2002.
2. P.Naughton and H.Schildt –Java2 (The Complete References)-Seventh Edition,TMH 2004.

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2. www.tutorialspoint.com
3. www.javapoint.com
4. www.geeksforgeeks.org

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- 1.https://www.tutorialspoint.com/java/java_tutorial.pdf
2. <https://www.iitk.ac.in/esc101/share/downloads/javanotes5.pdf>
3. <https://www.slideshare.net/intelligotech/java-tutorial-ppt-7189933>
4. <https://www.slideshare.net/VeerabadraBadra/introduction-to-java-9266993>

COURSE OBJECTIVES**(Employability)**

1. Understand the difference between open source software and commercial software.
2. Familiarity with Linux operating system.
3. Understanding and development of web applications using open source web technologies like Apache, MySQL and PHP (LAMP/XAMP).

UNIT I**12**

OPEN SOURCE: Introduction to Open Source – Open Source vs. Commercial Software – What is Linux? - Free Software – Where I can use Linux? Linux Kernel – Linux Distributions

UNIT II**12**

LINUX: Introduction to Linux Essential Commands – Filesystem Concept - Standard Files 1. The Linux Security Model - Vi Editor - Partitions creation - Shell Introduction 2. String Processing - Investigating and Managing Processes - Network Clients - Installing Application.

UNIT III**12**

APACHE: Apache - Starting, Stopping, and Restarting Apache - Modifying the Default Configuration - Securing Apache - Set User and Group - Consider Allowing Access to Local Documentation - Don't Allow public html Web sites - Apache control.

UNIT IV**12**

MYSQL: Introduction to MYSQL - The Show Databases and Table - The USE command - Create Database and Tables - Describe Table - Select, Insert, Update, and Delete statement - Some Administrative detail - Table Joins - Loading and Dumping a Database.

UNIT V**12**

PHP: Introduction- General Syntactic Characteristics - PHP Scripting - Commenting your

code - Primitives, Operations and Expressions - PHP Variables - Operations and Expressions Control Statement - Array - Functions - Basic Form Processing - File and Folder Access - Cookies - Sessions - Database Access with PHP - MySQL - MySQL Functions - Inserting Records - Selecting Records - Deleting Records - Update Records.

Total No of Hours : 60

COURSE OUTCOMES:

On completion of this course, the students can be able to:

CO1: Write session control PHP code for a website

CO2: Develop web applications using LAMP.

CO3: Identify, install and run open source technologies like PHP MySQL ,Apache

CO4: Understand the difference between open source software and commercial software

CO5: State some basic concepts of open Source Technologies

TEXT BOOKS

1. James Lee and Brent Ware , "Open Source Web Development with LAMP using Linux, Apache, MySQL, Perl and PHP", , Dorling Kindersley(India) Pvt. Ltd, 2008.

REFERENCE BOOK:

1. Eric Rosebrock, Eric Filson , "Setting Up LAMP: Getting Linux, Apache, MySQL, and PHP and working Together", Published by John Wiley and Sons, 2004

WEBSITES

1. www.w3schools.com
2. www.tutorialspoint.com
3. www.javapoint.com
4. www.geeksforgeeks.org

WE SOURCES

1. https://tavaana.org/sites/default/files/introduction_to_opensource.pdf
2. http://www.gov.pe.ca/photos/original/IPEI_ebiz_oss.pdf
3. https://www.tutorialspoint.com/php/php_tutorial.pdf
4. https://www.tutorialspoint.com/mysql/mysql_tutorial.pdf

COURSE OBJECTIVE**(Employability)**

- This subject deals with the methods of data structures.
- On successful completion of this subject the students should have :
 - Writing programming ability on data structures
 - Dealing with Stacks, Queues, List,
 - Algorithms etc.,

UNIT I INTRODUCTION 12

Definition of a Data Structure – Primitive and Composite data types, Asymptotic notations – Arrays – operations on arrays – ordered list.

UNIT II STACK 12

Stacks – Application of stack – Infix to postfix conversion, Recursion, queues – operation on Queue , Queue application , circular queues.

UNIT III LINKED LIST 12

Singly linked list – Operation, Application – representation of a polynomial, polynomial addition, doubly linked list-Operation.

UNIT IV TREES AND GRAPHS 12

Trees and Graphs: Binary Trees – Operation, tree traversals – Graph Implementation – Definition, Types of graph, Traversal– Shortest Path Problems, Dijkstra’s algorithm.

UNIT V ALGORITHM 12

Algorithm-Definition-examples-Complexity-Divide and Conquer- Binary search - Maximum and Minimum-Merge sort.

Total No of Hours:

COURSE OUTCOME:

On Completion of this course, the students can able to,

CO1: Critically analyze various sorting algorithms.

CO2: Distinguish between different data types, different data storage methods and discover appropriate data types for a particular application

CO3: Apply linear & Non-linear data structures to problem solving.

CO4: List the Relationship between Linear & Non-Linear data structures like trees and graphs

CO5: Identify the Importance of various types of linked lists

TEXT BOOKS:

1. E. Horowitz, S. Sahni and Mehta – “Fundamentals of Data Structures in C++” - 2nd Edition, Universities Press – 2008.
2. Horowitz, S. Shani, and S. Rajasekaran, “computer algorithms”, galgotia pub. Ltd., 2000.

REFERENCE BOOKS:

1. E Balagurusamy: Programming in ANSI C, Tata McGraw-Hill, 1998.
2. Ellis Horowitz & Sartaj Sahni: Fundamentals of Data Structure, Galgotia Book Source, 2000.
3. Data structure using C – Aaron M Tanenbaum, Yedidyehlangsam, Moshe J Augenstein, PHI Pub

WEBSITES

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2. www.tutorialspoint.com
3. www.javapoint.com
4. www.geeksforgeeks.org

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1. <https://www.cs.bham.ac.uk/~jxb/DSA/dsa.pdf>
2. https://www.darshan.ac.in/Upload/DIET/Documents/CE/2130702_DS_2015_24112_015_025019AM.pdf
3. <https://www.cs.yale.edu/homes/aspnes/classes/223/notes.pdf>
4. <https://www.slideshare.net/DhavalKaneria/introduction-to-data-structures-and-algorithm-35441665>

COURSE OBJECTIVE

(Employability)

To give an insight into the basics of Accounting Concepts and Principles to Prepare to Students to have the foot hold in Accounts.

UNIT I INTRODUCTION TO ACCOUNTING 12

Meaning and definition of accounting- functions of accounting – limitations of accounting – accounting concepts and conventions, systems of accounting – single entry system – double entry system – subsidiary books including cash book – trial balance – rectification of errors.

UNIT II PREPARATION OF FINAL ACCOUNTS 12

Final accounts with adjustments – closing stock, outstanding expenses, unexpired or prepaid expense, accrued income, income received in advance, depreciation, additional bad debts, provision for doubtful debts, provision for discount on debtors, interest on capital, interest on drawing, discount on creditors and creation of various reserves.

UNIT III BANK RECONCILIATION STATEMENT AND ACCOUNTS 12

Bank reconciliation statement – Importance of Bank Reconciliation Statement – Scope of Bank Reconciliation Statement - Insurance Claim Account – loss of property and stock – average clause.

UNIT IV CALCULATION OF DEPRECIATION UNDER DIFFERENT

12

Depreciation accounts – definition and causes of depreciation – need for depreciation – methods of calculating the amount of depreciation – straight line method – diminishing balance method.

UNIT V SINGLE ENTRY SYSTEM OF ACCOUNTING 12

Single entry system – salient features – limitations of single entry system – distinction

between single entry system and double entry system – ascertainment of profit – net worth method – conversion method (simple problems only)

Total No of Hours : 60 Hrs

COURSE OUTCOME

At the end of this course the students can able to,

CO1: Develop accounts using adjustment. Combinational circuits

CO2: Build Journal, ledger and Balance Sheet.

CO3: Analyze the depreciation under different methods

CO4: Understand the basic concepts of accounting

CO5: Explain single entry and double entry system.

TEXT BOOKS:

1.T.S.Reddy&A.Murthy, “Financial Accounting”, Margham Publications, Sixth Revision Edition, 2011.

2.P.C. Tulsian, “Financial Accounting”, Tata MC Graw Hill Ltd, 2003.

REFERENCES:

1.Assish K. Bhattacharyya, “Financial Accounting”, Prentice of hall of India, 2002.

2.N. Vinayagam and B. Charumaki, “Financial Accounting”, S.Chand& Company Ltd., 2002, Reprint – 2008.

WEBSITES

1. www.accountigcoach.com
2. www.topaccountingdegrees.org

WEB SOURCES

1. <https://www.csus.edu/indiv/c/clarket/course1/chap001.pdf>
2. <https://www.slideshare.net/ashu1983/financial-accounting>

COURSE OBJECTIVE: Skill Development

- To make students familiar with oops & applet programming
- Java programming can be used to develop both web based & console based application & stand-alone application
- Java is one of the top most languages used in most of the IT companies. It is a job assured course.

LIST OF PROGRAMS**APPLICATIONS****15**

1. Area of shapes using Overloading/Overriding/Interface concepts.
2. Substring Removal from a String.
3. Determining the order of numbers generated randomly using Random Class.
4. Usage of Calendar Class and its manipulation.
5. String Manipulation using built-in functions.
6. Usage of Vector Classes.
7. Implementation of Thread based application.
8. Implementation of Exception Handling.

APPLET**15**

Working with Frames and various controls to prepare a Bio-data form.

Working with Dialogs and Menus.

Working with Panels and Layouts.

Working with various shapes using Graphics class.

Working with Colors and Fonts.

Total No of Hours:**30**

COURSE OUTCOME

On Completion of this course, the students can able to

CO1: Build Applet programs using AWT classes and utilize Controls and Layout Managers

CO2: Write a computer program to solve specified problems and use Java SDK Environment to create, debug and run simple java programs

CO3: Develop the Java Classes make use of Constructors and Inheritance

CO4: Develop the packages and classify the thread communication

CO5: Develop simple java application using java features and OOPs concepts

TEXT BOOKS

3. Cay S.Horstmann, Gary Cornell-Core Java 2 Volume 1 – Fundamentals,5th PHI,2000.
4. E.Balaguruswamy, "Programming with JAVA",3rd edition ,Tata McGraw- Hill Publications, 2007.

REFERENCE BOOKS

1. K.Arnold and J.Gosling- The Java Programming Language – Second Edition,Addison Wesley,2002.
2. P.Naughton and H.Schildt –Java2 (The Complete References)-Seventh Edition,TMH 2004.

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4. www.geeksforgeeks.org

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- 1.https://www.tutorialspoint.com/java/java_tutorial.pdf
2. <https://www.iitk.ac.in/esc101/share/downloads/javanotes5.pdf>
3. <https://www.slideshare.net/intelligotech/java-tutorial-ppt-7189933>
4. <https://www.slideshare.net/VeerabadraBadra/introduction-to-java-9266993>

COURSE OBJECTIVES: Skill Development

1. Understand the difference between open source software and commercial software.
2. Familiarity with Linux operating system.
3. Understanding and development of web applications using open source web technologies like Apache, MySQL and PHP

LIST OF PROGRAMS

1. Write a Shell script that accepts a filename, starting and ending line numbers as arguments and displays all the lines between the given line numbers?
2. Write a Shell script to list all of the directory files in a directory.
3. Write a Shell script to find factorial of a given integer?
4. Write awk script to find the number of characters, words and lines in a file?
5. Installation Apache
6. Creating TABLE using My SQL.
7. Data Manipulation Commands
8. Joining Database Tables
9. Palindrome or Not in PHP
10. Connect PHP with My SQL
11. Create Login page with help of PHP and My SQL

Total No of Hours:

30

COURSE OUTCOMES:

On completion of this course, the students can be able to:

CO1:Write session control PHP code for a website

CO2: Develop web applications using LAMP.

CO3:Identify, install and run open source technologies like PHP MySQL ,Apache

CO4:Develop a database connectivity among PHP to MySQL .

CO5: Develop simple applications using PHP.

TEXT BOOKS

1. James Lee and Brent Ware, "Open Source Web Development with LAMP using Linux, Apache, MySQL, Perl and PHP", , Dorling Kindersley(India) Pvt. Ltd, 2008.

REFERENCE BOOK:

1. Eric Rosebrock, Eric Filson, "Setting Up LAMP: Getting Linux, Apache, MySQL, and PHP and working Together", Published by John Wiley and Sons, 2004

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2. http://www.gov.pe.ca/photos/original/IPEI_ebiz_oss.pdf
3. https://www.tutorialspoint.com/php/php_tutorial.pdf
4. https://www.tutorialspoint.com/mysql/mysql_tutorial.pdf

IV
SEMESTER

COURSE OBJECTIVES:**(Employability)**

- Describe the core syntax and semantics of Python programming language.
- Discover the need for working with the strings and functions.
- Illustrate the process of structuring the data using lists, dictionaries, tuples and sets.
- Understand the usage of packages and Dictionaries.

UNIT I INTRODUCTION DATA, EXPRESSIONS, STATEMENTS**15**

Introduction to Python- Features of Python- Installation of Python-Python Indentation- Variables and Identifiers- Keywords-Data types- Python operators- Expressions- Input/ Output functions- Create your First Python Program

UNIT II CONTROL FLOW, LOOPS, FUNCTIONS**15**

Conditional statement-if, if-else, elif, Nested if-Pass statement- Iteration: while, for, break, continue- Function - Defining A Function - Calling A Function - Function Arguments - Recursive Function - Function Returning More Than One Value- Lambda functions

UNIT III ARRAYS, MODULES AND PACKAGE**15**

Python arrays, Access the Elements of an Array, arraymethods, Numpy- Modules Overview - Modules Search Path - Import Statement -dir() Function - Executing A Module - Renaming A Module - Python Packages - Packages initialization - Importing modules from a package - Sub Packages.

UNIT IV DICTIONARIES, SETS LISTS, TUPLES,**15**

Dictionary type in Python - Set Data type- Lists type in Python- Tuple type in Python

Object Oriented Programming using Python: Encapsulation - Inheritance – Polymorphism

UNIT V ERRORS AND EXCEPTION HANDLING, FILES,

15

Errors- Exception Handling: try block, except block and finally block- Files: Opening a File - Closing a File- Reading And Writing a File - File Methods - Renaming and Deleting A File - Built-in file directories in Python.

**Total No of Hours :
75**

COURSE OUTCOMES:

On Completion of this Course, the students can able to,

CO1: Develop Packages by importing appropriate modules.

CO2: Develop the emerging applications of relevant field using Python.

CO3: Interpret the fundamental Python syntax and semantics and be fluent in the use of Python control flow statements.

CO4: Apply the concept of Sets , dictionaries & tuples in Python

CO5: Understand the principles of Python and acquire skills in programming in python

TEXT BOOKS:

1. Charles Dierbach, “Introduction to Computer Science using Python - A computational Problem solving Focus”, Wiley India Edition, 2015.

REFERENCE BOOKS:

1. Timothy A. Budd, “Exploring Python”, Tata MCGraw Hill Education Private Limited 2011, 1st Edition.

2 . Ch Satyanarayana M Radhika Mani, B N Jagadesh, “Python programming”, Universities Press 2018.

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1. www.w3schools.com
2. www.tutorialspoint.com
3. www.javapoint.com
4. www.geeksforgeeks.org

UNIT–V UNIX

12

UNIX Commands.

Total No of Hours :

60

COURSE OUTCOMES:

On completion of this course, the students will be able to:

CO1: Compare the performance of Scheduling Algorithms

CO2: Analyze resource management techniques

CO3: Identify the features of I/O and File handling methods

CO4: Understand the structure and functions of Operating System

CO5: Describe process, process states, scheduling queues, policies for scheduling, deadlocks, memory management, synchronization, system calls, and file systems.

TEXTBOOKS:

1. Abraham Silberschatz, Peter B. Galvin, Greg Gagne, “Operating System Concepts” 9th Edition, John Wiley, 2013
2. Deitel H.M. “An Introduction to Operating System”, Addison Wesley Publishing Co., 2003

REFERENCE BOOKS:

1. William Stallings, “Operating Systems Internals and Design Principles”, 9th Edition, Pearson, 2018.
2. Andrew S. Tanenbaum, Herbert Bos, “Modern Operating Systems”, 4rd Edition, Pearson 2014.

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2. www.tutorialspoint.com
3. www.javapoint.com
4. www.geeksforgeeks.org

WEB SOURCES

1. https://www.tutorialspoint.com/operating_system/operating_system_tutorial.pdf
2. <https://www.cl.cam.ac.uk/teaching/1011/OpSystems/os1a-slides.pdf>

Roots of equations: Graphical Method- Bisection Method- False position Method – Newton –Raphson’s Method- Secant Method- Algebraic Equations: Gauss Elimination Method- Gauss- Jordan Method- Matrix Inverse Method- Gauss-Seidel Method.

UNIT V NUMERICAL DIFFERENTIATION AND INTEGRATION 15

Numerical Differentiation- Errors in Numerical Differentiation-Cubic Spline Method- Numerical Integration- Trapezoidal Rule-Simpson’s 1/3 and 3/8 Rules- Romberg Integration- Ordinary Differential Equations- Taylor’s Series Method- Euler’s Method- RungeKutta 2nd and 4th Order Methods.

Total No of Hours : 75

COURSE OUTCOMES:

On completion of this course, the students will be able to:

- CO1.** Understand the key terminology, concepts tools and techniques used in statistical analysis
- CO2.** Evaluate the underlying assumptions of analysis tools of correlation and regression
- CO3.** Understand the issues surrounding techniques and significance of testing of hypothesis
- CO4.** Analyze the uses and limitations and applications of algebraic and transcendental equations
- CO5**Analyze the utilization of differentiation and integration

TEXT BOOKS

- 1.S.P.Gupta, Statistical Methods, Sultan Chand & Sons, 35th Revised Edition,2007.
(Unit I,II,III)
2. S. Arumugam, A. Thangapandi Isaac and A. Somsundaram, Numerical Methods, Scitech Publications India Pvt. Ltd.2001.(Unit IV,V)

REFERENCE BOOKS:

1. P.R. Vital and V. Malini, Statistical and Numerical Methods, Margham Publications, 1st Edition,2007.
2. A. Singaravelu, Numerical Methods, Meenakshi Agency, 2008

WEB SOURCES

1. <https://d3bxy9euw4e147.cloudfront.net/oscms-prodcms/media/documents/IntroductoryBusinessStatistics-OP.pdf>
2. <http://www.ddegjust.ac.in/studymaterial/mcom/mc-106.pdf>

IV SEM
2

PYTHON PROGRAMMING LAB

0 0 4

COURSE OBJECTIVES: **Skill Development**

- To implement the python programming features in practical applications.
- To write, test, and debug simple Python programs.
- To implement Python programs with conditionals and loops.
- Use functions for structuring Python programs.
- Represent compound data using Python lists, tuples, dictionaries , Files and modules.

LIST OF PROGRAMS:

1. Program to calculate total marks, percentage and grade of a student. Marks obtained in each of the five subjects are to be input by user. Assign grades according to the following criteria:
Grade A: Percentage ≥ 80 Grade B: Percentage ≥ 70 and < 80
Grade C: Percentage ≥ 60 and < 70 Grade D: Percentage ≥ 40 and < 60
Grade E: Percentage < 40
2. Program, to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user.
3. Program to display the first n terms of Fibonacci series.
4. Program to find factorial of the given number using recursive function.
5. Write a Python program to count the number of even and odd numbers from array of N Nos.
6. Python program to reverse a given string and check whether the give string is palindrome or not.
7. Write a program to find sum of all items in a dictionary.
8. Write a program for finding largest number in a list.
9. Write a program for adding Tuple to List and vice – versa.
10. Write a program to illustrate packages.
11. Write a program for selection sort.

12. Write a program to read character by character and word by word from a file .

Total No of Hours

:30

COURSE OUTCOMES:

On Completion of this course, the students can able to,

CO1:Develop the numeric or real life application problems and solve them.

CO2:Write simple Python programs using control statements.

CO3:Write Programs using packages, sets , dictionaries & tuples.

CO4:Apply a solution clearly and accurately in a program using Python.

CO5:Apply the best features available in Python to solve the situational problems.

TEXT BOOKS:

1. Charles Dierbach, “Introduction to Computer Science using Python - A computational Problem solving Focus”, Wiley India Edition, 2015.

REFERENCE BOOKS:

1. Timothy A. Budd, “Exploring Python”, Tata MCGraw Hill Education Private Limited 2011, 1st Edition.
2 . Ch Satyanarayana M Radhika Mani, B N Jagadesh, “Python programming”, Universities Press 2018.

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3. www.javapoint.com
4. www.geeksforgeeks.org

WEB SOURCE

1. <http://interactivepython.org/courselib/static/pythonds>
2. <http://docs.python.org/3/tutorial/index.html>
3. <https://www.w3schools.com/python/default.asp>
4. https://www.tutorialspoint.com/python3/python_tutorial.pdf

COURSE OBJECTIVES: Skill Development

To introduce Basic Unix general purpose Commands, learn network Unix commands, Unix editor environment, Shell script concepts. The Course is also useful to learn file management and permission advance commands and to apply networking Unix commands.

LIST OF PROGRAMS:

1. Write Unix program to execute of various file/directory handling commands.
2. Simple shell script for basic arithmetic and logical calculations.
3. Write Shell scripts to check various attributes of files and directories
4. WriteShell scripts to perform various operations on given strings.
5. WriteShell scripts to explore system variables such as PATH, HOME etc.
6. WriteShell scripts to check and list attributes of processes.
7. Write Shell script program to copy contents of one file to another
8. Write Unix program to execute various system administrative commands.
9. Write awkscript that uses all of its features.
10. Write an awk script to develop a Fibonacci series.
11. Write Unix program using sed instruction to process /etc/password file.
12. Write a shell script to display list of users currently logged in.

Total No of Hours:**30****COURSE OUTCOMES:****On completion of this course, the students will be able to:****CO1:**Write the basic Unix general purpose commands**CO2:**Apply and change the ownership and file permissions using advance Unix commands**CO3:**Use the awk, grep, perl scripts.**CO4:**Apply networking Unix commands

CO5:Demonstrate shell scripts and sed.

TEXTBOOKS:

1. Abraham Silberschatz, Peter B. Galvin, Greg Gagne, “Operating System Concepts” 9th Edition, John Wiley, 2013
2. Deitel H.M. “An Introduction to Operating System”, Addison Wesley Publishing Co., 2003

REFERENCE BOOKS:

1. William Stallings, “Operating Systems Internals and Design Principles”, 9th Edition, Pearson, 2018.
2. Andrew S. Tanenbaum, Herbert Bos, “Modern Operating Systems”, 4rd Edition, Pearson 2014.

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2. <https://www.cl.cam.ac.uk/teaching/1011/OpSystems/os1a-slides.pdf>
3. <https://www.unf.edu/public/cop4610/ree/Notes/PPT/PPT8E/CH%2002%20-OS8e.pdf>
4. <http://www.ddegjust.ac.in/studymaterial/mca-5/mca-105.pdf>
5. <http://www.svecw.edu.in/Docs%5CCSEOSLNotes2013.pdf>
6. <https://www.maths.ox.ac.uk/system/files/legacy/2356/basic-unix.pdf>

V
SEMESTER

COURSE OBJECTIVE (Employability)

- To understand the basic concepts of data communication, layered model, protocols and interworking between computer networks and switching components in telecommunication systems.
- To provide the high Reliability
- To educate the student in modern networking technologies.

UNIT I :INTRODUCTION**15**

Introduction, Fundamental concepts: Characteristics – Components of Data communications, Data flow, Computer Network: Definition - Network criteria - Categories of Network, Distributed processing, Protocol, Standards, Standard organizations.

UNIT II:NETWORK MODELS**15**

The OSI reference model, peer-to-peer processes, Functions of the layers in the OSI model, TCP/IP protocol suite,.

UNIT III:MEDIA AND TRANSMISSION MODES**15**

Transmission mode, Digital data transmission, DTE/DCE interface, Modems, Guided Media and Unguided Media.

UNIT IV:NETWORK TOPOLOGIES**15**

Line Configuration, computer network topologies, Types of errors, Error Detection, Error Corrections.

UNIT V: SWITCHING AND ROUTING

15

Multiplexing, Types of Multiplexing, Switching - Circuit Switching - Packet Switching - Message switching , Networking and Internetworking devices , Routing and routing algorithm types.

Total No of Hours: 75

COURSE OUTCOMES:

On completion of this course, the students will be able to:

CO1: Understand basic computer network technologies and protocols.

CO2: Enumerate the layers of the OSI model and TCP/IP. Explain the function(s) of each layer.

CO3: Understand the rudiments of how computers communicate and their functions within a network

CO4: Identify the different types of network topologies.

CO5: Understand the basic aspects of packet-based design and implementation and familiar with modern communication systems.

TEXT BOOK

1. Behrouz and Forouzan - Introduction to Data Communication and Networking - 2nd Edition - TMH-2005.

REFERENCE BOOKS:

1. Jean Walrand 1998, Communication Networks (A first Course), Second Edition, WCB/McGraw Hill.
2. Behrouz and Forouzan, 2006, Data Communication and Networking, 3rd Edition , TMH.

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1. www.w3schools.com
2. www.tutorialspoint.com
3. www.javapoint.com
4. www.geeksforgeeks.org

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1. <http://www.engppt.com/2009/12/networking-fourozan-ppt-slides.html>
2. https://www.vssut.ac.in/lecture_notes/lecture1428550521.pdf
3. <http://www.indoreindira.com/UG/images/BCA/BCA%20IV%20%20Notes/BCA%20IV%20PDF/BCA%20IV%20sem%20Data%20&%20Network%20Communication.pdf>
4. https://mrcet.com/downloads/digital_notes/ECE/III%20Year/DATA%20COMMUNICATIONS.pdf

**DISCIPLINE SPECIFIC
ELECTIVE
(DSE)**

V
SEMESTER

COURSE OBJECTIVE: (Employability)

- This course introduces the fundamental concepts of digital logic.
- This subject deals various number system, code conversions and Boolean algebra.
- To learn the universal gates, flip flops and registers.

UNIT I NUMBER SYSTEM AND CODES 09

Number System : Binary to decimal, Binary to Octal, Binary to Hexadecimal, Decimal to Binary, Decimal to Octal, Decimal to Hexadecimal, Octal to Binary-Octal to Decimal, Octal to Hexadecimal, Hexadecimal to Binary , Hexadecimal to Decimal , Hexadecimal to Octal - Binary Codes – Complements: r 's Complement ,($r-1$)'s Complement ,Subtraction using Complements -Code Conversion - Digital Logic: Logic Gates – Truth Tables – Universal Gates.

UNIT II BOOLEAN ALGEBRA 09

Boolean algebra: Boolean Laws , Theorems & Postulates – Simplification of Boolean Functions – Minterms - Maxterms – SOP – POS – Duality and Complements – Canonical Form of Expression- Karnaugh-Map (up to 5 variables) – Binary Addition – Binary Subtraction.

UNIT III COMBINATIONAL CIRCUITS 09

Combinational Circuits : Introduction -Adders , Half-Adder , Full-Adder – Subtractor ,Half-Subtractor -Full-Subtractor – Decoder – De-Multiplexer – Encoder - Multiplexer – Code Binary Parallel Adder – Code Converter – Parity bit Generators & Checker.

UNIT IV SEQUENTIAL CIRCUITS 09

Sequential Circuits: Introduction – Flip-Flops - Basic RS Flip-Flop, Clocked RS Flip-Flop, JK Flip-Flop, D Flip Flop, T Flip-Flop & Master – Slave Flip Flop.

UNIT V COUNTERS & REGISTERS 09

Counters, Design of Counters -Asynchronous Counters: Ripple Counter – Synchronous

Counters – Registers - Shift Registers – RAM – ROM - Types of ROMs – Types of RAMs.

Total No of Hours: 45

COURSE OUTCOMES

On completion of this course, the students will be able to:

- CO1: Demonstrate logic design of computer and digital system design.
- CO2: Understand Sequential Logic Circuits.
- CO3: Understand Combinational Logic Circuits.
- CO4: Define the concepts of digital Number Systems.
- CO5: Describe digital logic design and apply it to solve real problems.

TEXT BOOK

1. M.Moris Mano, Digital Logic and Computer Design, PHI, 2001.

REFERENCE BOOKS

1. D.P.Leach & A.P. Malvino, Digital Principles and Applications – TMH – Fifth Edition 2002.
2. T.C.Bartee, Digital Computer Fundamental, 6th Edition, Tata McGraw Hill, 2001.

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2. www.mkp.com
3. Www.w3schools.com
4. Www.tutorialspoint.com
5. <https://en.wikipedia.org>
6. Www.geeksforgeeks.org
7. www.guru99.com

WEB SOURCES

1. file:///C:/Users/jvip/OneDrive/Desktop/NET%202021/91573-00_DigitalLogicFundamentals_SW_ED4_PR2_web.pdf
2. <https://www.uou.ac.in/old-papers/june-2019/BCA-01.pdf>
3. [https://mrcet.com/downloads/digital_notes/IT/DIGITAL%20LOGIC%20DESIGN%20\(R17A0461\).pdf](https://mrcet.com/downloads/digital_notes/IT/DIGITAL%20LOGIC%20DESIGN%20(R17A0461).pdf)

V SEM DSE I INTRODUCTION TO INFORMATION TECHNOLOGY 3 0 0

COURSE OBJECTIVE (Employability)

- The main objective is to introduce IT in a simple language to all undergraduate students, regardless of their specialization.
- It will help them to pursue specialized programs leading to technical and professional careers and certifications in the IT industry.
- The focus of the subject is on introducing skills relating to IT basics, computer applications, programming, interactive medias, Internet basics etc.
- After completing the course the incumbent is able to use the computer for basic purposes of preparing his personnel/business letters, viewing information on Internet (the web), sending mails, using internet banking services etc.

UNIT I: INTRODUCTION TO COMPUTERS

09

Introduction, Definition, Characteristics of computer, Evolution of Computer, Block Diagram Of a computer, Generations of Computer, Classification of Computers, Applications of Computer, Capabilities and limitations of computer.

UNIT II: BASIC COMPUTER ORGANIZATION

09

Role of I/O devices in a computer system. Input Units: Keyboard, Terminals and its types. Pointing Devices, Scanners and its types, Voice Recognition Systems, Vision Input System, Touch Screen, Output Units: Monitors and its types. Printers: Impact Printers and its types. Non- Impact Printers and its types, Plotters, types of plotters, Sound cards, Speakers.

UNIT III: STORAGE FUNDAMENTALS

09

Primary Vs Secondary Storage, Data storage & retrieval methods. Primary Storage: RAM ROM, PROM, EPROM, EEPROM. Secondary Storage: Magnetic Tapes, Magnetic Disks. Cartridge tape, hard disks, Floppy disks Optical Disks, Compact Disks, Zip Drive, Flash Drives.

UNIT IV: SOFTWARE

09

Software and its needs, Types of S/W. System Software: Operating System, Utility Programs. Programming Language: Machine Language, Assembly Language, High Level Language their advantages & disadvantages. Application S/W and its types: Word

Processing, Spread Sheets Presentation, Graphics, DBMS s/w

UNIT V: INTRODUCTION TO INTERNET AND COMPUTER SECURITY09

Basic of Computer Networks; LAN, WAN; Concept of Internet; Applications of Internet; Connecting to Internet, ISP, World Wide Web; Web Browsing Software, Search Engines, Understanding URL, Domain name; IP Address; Basics of E-Mail. Introduction to Computer Security: Security Threat and Security Attack, Malicious Software, Security Mechanisms (Cryptography, Digital Signature, Firewall, Users Identification and Authentication, Intrusion Detection Systems);

Total No Of Hours: 45

COURSE OUTCOME

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

- CO1: Sketch the software and storage requirements.
- CO2: Interpret the issues related to information security.
- CO3: Understand the basis of computer networks.
- CO4: Understanding of personal computers and their operations.
- CO5: Define basic concepts and terminology of information technology.

TEXT BOOKS:

1. "Introduction to Computers ", Peter Norton ,Sixth Edition
2. New Perspectives on the Internet, Comprehensive, Sixth Edition, Schneider and Evans, 2007, ISBN: 1-4188-6071-9

REFERENCE BOOK:

1. Introduction to Information Technology by V. Rajaraman, Third Edition
2. Computer Fundamentals : Concepts, Systems & Applications- 8th Edition by Priti Sinha, Pradeep K. Sinha
3. The Internet Book: Everything You Need to Know About Computer Networking and How the Internet Works by Douglas E. Comer

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2. www.mkp.com
3. Www.w3schools.com
4. Www.tutorialspoint.com

5. <https://en.wikipedia.org>
6. [Www.geeksforgeeks.org](http://www.geeksforgeeks.org)
7. www.investopedia.com
8. www.guru99.com

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1. <http://teamslive.com/DOWNLOADS/Bharathiar%20University%20Study%20Materials/UG/B.Com%20Computer%20Application/First%20Year/Introduction%20to%20Information%20Technology.pdf>
2. <https://www.slideshare.net/adpafit/introduction-to-information-technology-lecture-1>
3. <https://www.nagarjunauniversity.ac.in/ugsyllabus/bcasyll.pdf>
4. <https://slideplayer.com/slide/12430457/>

V SEM DSE I COMPUTER ARCHITECTURE 3 0 0 3

COURSE OBJECTIVE: (Employability)

This course introduces the principles of computer organization and the basic architecture concepts. The course emphasizes performance and cost analysis, instruction set design, pipelining, memory technology, memory hierarchy, virtual memory management, and I/O systems.

UNIT I COMPUTER EVOLUTION

09

Pentium and Power PC Evolution. Computer System: Components – Function – Interconnection Structures – Bus Interconnection – Basics of PCI Bus. Memory: Characteristics – Hierarchy – Cache Memory – Principles – Cache Design – Locality of Reference.

UNIT II MAIN MEMORY

09

Static RAM – Dynamic RAM – Types of ROM – Memory Chip Organization – Types of DRAM. External Memory: Magnetic Disk – Basics of RAID – Optical Memory – Magnetic Tapes

UNIT III INPUT/OUTPUT

09

External Devices – I/O Module – Programmed I/O – Interrupt Driven I/O – DMA – I/O Channels & Processors. Computer Arithmetic: ALU – Integer Representation and Arithmetic – Floating Point Representation and Arithmetic. Instruction Set: Characteristics – Operand Types – Operation Types – Addressing Modes – Instruction Formats – Pentium and Power PC Operands, Operations, Addressing Modes (Simple Examples).

UNIT IV CPU: ORGANIZATION OF PROCESSORS AND REGISTERS

09

Instruction Cycle – Instruction Pipelining – Pentium Processor. RISC: Characteristics – Large Register File – Register Optimization – Architecture – RISC Vs CISC Characteristics – Pipelining.

UNIT V CONTROL UNIT

09

Micro-Operations – Control of Processors – Hardwired Implementation - Micro Programmed Control Concepts – Microinstruction Sequencing – General Microinstruction Execution.

COURSE OUTCOMES

On completion of this course, the students will be able to:

- CO1: Illustrate the concept of processing I/O organization and examine different ways of communicating with I/O devices and standard I/O interfaces.
- CO2: Explain RISC /CISC Characteristics, Optimization, Pipeline Concept.
- CO3: Understanding of digital system, its organization and architecture.
- CO4: Understand the design process of a computer and critical elements in each step.
- CO5: Define the roles of various functional units of a computer in instruction execution.

TEXT BOOKS

1.W. Stallings ,2003,Computer Organization and Architecture, 6th Edition- PHI,New Delhi.

REFERENCE BOOKS

1.C. Hamacher, Z. Vranesic, S.Zaky, 2002, Computer Organization,5thEdition,Mcgraw Hill.

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5. <https://en.wikipedia.org>
6. Www.geeksforgeeks.org
7. www.investopedia.com
8. www.guru99.com

WEB SOURCES

1. https://gurukpo.com/Content/BCA/Computer_Architecture.pdf
2. <http://www.cs.iit.edu/~virgil/cs470/Book/>
3. <https://www.eguardian.co.in/computer-architecture-mcqs/>

COURSE OBJECTIVES: (Employability)

To identify the scope and essentiality of Data Mining. To analyze data, choose relevant models and algorithms for respective applications. To study the spatial and web data mining. To develop a research interest towards advances in data mining.

UNIT I INTRODUCTION 09

Data mining – Functionalities – Classification – Introduction to Data Warehousing – Data Preprocessing : Preprocessing the Data – Data cleaning – Data Integration and Transformation – Data Reduction

UNIT II DATA MINING, PRIMITIVES, LANGUAGES AND SYSTEM ARCHITECTURE 09

Data Mining – Primitives – Data Mining Query Language,. Architectures of Data mining Systems. Concept Description, Characterization and Comparison: Concept Description, Data Generalization and Summarization, Analytical Characterization, Mining Class Comparison – Statistical Measures

UNIT III MINING ASSOCIATION RULES 09

Basics Concepts – Single Dimensional Boolean Association Rules From Transaction Databases, Multilevel Association Rules from transaction databases – Multi dimension Association Rules from Relational Database and Data Warehouses.

UNIT IV CLASSIFICATION AND PREDICTION 09

Introduction – Issues – Decision Tree Induction – Bayesian Classification – Classification of Back Propagation. Classification based on Concepts from Association Rule Mining – Other Methods. Prediction – Introduction – Classifier Accuracy

UNIT V CLUSTER ANALYSIS 09

Introduction – Types of Data in Cluster Analysis, Partitioning Methods – Hierarchical Methods Density Based Methods – GRID Based Method – Model based Clustering Method

Total No of Hours :

COURSE OUTCOMES:

On completion of this course, the students will be able to:

- CO1: Apply data mining techniques to solve problems in other disciplines in a mathematical way.
- CO2: Understand data mining strengths and weaknesses
- CO3: Understand the basic principles in data mining.
- CO4: Define data warehousing and knowledge discovery process
- CO5: Identify the key processes of data mining,

TEXT BOOK:

1. J.Han and M. Kamber,2001,Data Mining Concepts and Techniques,Harcourt India Pvt. Ltd - New Delhi.

REFERENCE BOOK

1. K.P. Soman , ShyamDiwakar, V.Ajay ,2006, Insight into Data Mining Theory and Practice, Prentice Hall of India Pvt. Ltd - New Delhi.

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5. <https://en.wikipedia.org>
6. Www.geeksforgeeks.org
7. www.investopedia.com
8. www.guru99.com

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1. https://vssut.ac.in/lecture_notes/lecture1428550844.pdf
2. <https://netflixsub.com/data-mining-and-warehousing-mcq-questions-bank/>
3. https://www-users.cs.umn.edu/~kumar001/dmbook/dmslides/chap1_intro.pdf

COURSE OBJECTIVES: (Employability)

Building the fundamentals of data science. Imparting design thinking capability to build big-data. Developing design skills of models for big data problems. Gaining experience in programming tools for data sciences. Empowering students with tools and techniques used in data science. Understand the basic concepts of data analytics & familiar with the data analytics life cycle developing skills for data preprocessing, model creations and visualizing the results.

UNIT I : INTRODUCTION 09

Data science – Terminology Related with Data Science – Methods of Data Repository – Methods of Data Repository – Personnel Involved with Data Science – Types of Data – The Data Science Process (DSP)

UNIT II DATA ANALYSIS AND EXPLORATION 09

AI, Machine Learning and Data Science – Data Science Classification – Data Science Algorithms – Data Preparation – Data Modelling - Data Preparation – Data Modelling - Data Exploration – Exploratory Data Analysis – Principal Component Analysis – Datasets

UNIT – III DATA VISUALIZATION 09

Descriptive Statistics: Estimation – Classification of Visualization Methods – Composition – Comparison - Statistical Inference: Introduction – Statistical Inference – Measuring the Variability in Estimates – Hypothesis Testing.

UNIT – IV REGRESSION CLASSIFICATION 09

Regression Analysis: Linear Regression – Logistic Regression - Decision Tree - Rule Induction – k-Nearest Neighbors- Random Forest – Support Vector Machine

UNIT – V ASSOCIATION ANALYSIS & CLUSTERING 09

Mining Association Rules – Apriori algorithm - k-Means Clustering – DBSCAN.

**Total No of Hours:
45**

On completion of this course, the students will be able to:

CO1: Explain clustering and association analysis.

CO2: Explain Regression and classification algorithm.

CO3: Understand the classification and various methods to visualize the data.

CO4: Describe the difference between small data and big data.

CO5: Define the characteristics of data set & Analyze the data.

TEXT BOOKS:

1. [V.K. Jain](#), Data Science and Analytics (with Python, R and SPSS Programming), [KHANNA PUBLISHING HOUSE](#), 2018, Reprint 2019.
2. [David Paper](#), Data Science Fundamentals for Python and MongoDB, [Apress](#), 2018
3. [Vijay Kotu](#), [Bala Deshpande](#), Data Science Concepts and Practice, [Elsevier Science](#) 2018

REFERENCE BOOKS

1. V.K. Jain, Big Data and Hadoop, Khanna Book Publishing, Delhi
2. [Laura Igual](#), [Santi Seguí](#), [Eloi Puertas](#), [Petia Radeva](#), [Oriol Pujol](#), [Sergio Escalera](#), [Francesc Dantí](#), [Lluís Garrido](#) Introduction to Data Science - A Python Approach to Concepts, Techniques and Applications, [Springer International Publishing](#), 2017
3. [Ivo D. Dinov](#), Biomedical and Health Applications Using R, [Springer International Publishing](#), 2018

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2. <http://bedford-computing.co.uk/learning/wp->

content/uploads/2016/09/introducing-data-science-machine-learning-python.pdf

3. <https://www.objectivequiz.com/objective-questions/computer-science/data-science>

COURSE OBJECTIVES (Employability)

To facilitate students to understand android SDK. To help students to gain a basic understanding of Android application development. To inculcate working knowledge of Android Studio development tool

UNIT – I INTRODUCTION**09**

Introduction to Android: The Android Platform-Android SDK-Eclipse Installation-Android Installation-BuildingFirst Android application- Understanding Anatomy of Android Application.

UNIT –II ANDROID APPLICATION DESIGN**09**

Android Application Design Essentials: Anatomy of an Android applications- Android terminologies-Application Context- Activities- Services- Intents- Receiving and Broadcasting Intents-Using Intent Filter-Permissions.

UNIT –III USER INTERFACE DESIGN**09**

Android User Interface Design Essentials: User Interface Screen elements- Designing User Interfaces with Layouts- Drawing and Working with Animation.

UNIT – IV TESTING**09**

Testing Android applications- Publishing Android application- Using Android preferences- ManagingApplication resources in a hierarchy- working with different types of resources.

UNIT – V API**09**

Using Common Android APIs: Using Android Data and Storage APIs- Managing data using SQLite-Sharing Data between Applications with Content Providers-Deploying Android Application to the World.

Total No of Hours :45**COURSE OUTCOMES**

At the end of this course, students will be able to:

- CO1: Understand applications to the Android marketplace for distribution.
- CO2: Explain the primary purpose of mobile applications for the Android operating system that use basic and advanced phone features,
- CO3: Understand rapid prototyping techniques to design and develop sophisticated mobile interfaces,
- CO4: Describe mobile applications on their design pros and cons,
- CO5: Define various concepts of mobile programming that make it unique from programming for other platforms,

TEXT BOOKS:

1. T1. Lauren Darcey and Shane Conder, "Android Wireless Application Development", Pearson Education, 2nd ed. (2011)

REFERENCE BOOKS:

1. Reto Meier, "Professional Android 2 Application Development", Wiley India Pvt Ltd
2. Mark L Murphy, "Beginning Android", Wiley India Pvt Ltd
3. Android Application Development All in one for Dummies by Barry Burd, Edition: I

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4. [Www.geeksforgeeks.org](http://www.geeksforgeeks.org)
5. www.investopedia.com
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1. <https://www.cs.cmu.edu/~bam/uicourse/830spring09/BFeiginMobileApplicationDevelopment.pdf>
2. <https://mrcet.com/pdf/Lab%20Manuals/IT/R15A0563%20MAD.pdf>
3. <https://www.mediapiac.com/uploads/conference/presenters/documents/17/8.pdf>
4. <https://lecturenotes.in/subject/465/mobile-application-development>

V SEM III DSE

OPERATIONS RESEARCH

3 0 0 3

COURSE OBJECTIVE: (Employability)

To impart knowledge in concepts and tools of Operations Research; To understand

mathematical models used in Operations Research; To apply these techniques constructively to make effective business decisions.

UNIT I INTRODUCTION TO OPERATION RESEARCH 9

Introduction: Definition- Scope of OR in Business - Linear Programming Problems –Formulation – Graphical method of solution- Standard form of LPP- Canonical form of LPP- Simplex method.

UNIT II TRANSPORTATION AND ASSIGNMENT PROBLEMS 9

Transportation Problems: Introduction-Balanced and Unbalanced Transportation Problems- IBFS for finding North West Corner Rule-Least Cost Method- Vogel's Approximation Method-MODI Method.

Assignment Problems: Introduction-Balanced and Unbalanced Assignment Problems- Maximization case in Assignment Problems.

UNIT III SEQUENCING PROBLEMS 9

Sequencing: Introduction- Processing 'n' jobs on 2 machines-Processing 'n' jobs on 3 machines-Processing 'n' jobs on 'm' machines- 2 jobs with 'm' machines

UNIT IV GAME THEORY 9

Game Theory: Introduction – Two Person Zero Sum Games –Game with Saddle Point- Game without Saddle Point-Solution of 2x2 games without Saddle Point- Dominance Property-Matrix Oddment Method- Graphical Method for 2xn or mx2 games.

UNIT V NETWORK ANALYSIS 9

Network Analysis: Introduction – Basic Terminologies –Construction of Network-Critical Path method (CPM)- PERT- Float Analysis-Total Float-Free Float-Independent Float-Difference Between CPM and PERT.

Total No Of Hours : 45

COURSE OUTCOME:

At the end of the course the students will be able to

CO1: Identify and develop operational research models from the verbal description of the real

system.

CO2:Create technique to solve the transportation and assignment problems.

CO3: Develop a report that describes the network model and the solving technique, analyze the results

CO4:Apply the decision-making processes in sequencing problems.

CO5:Apply the decision-making processes in game theory

TEXT BOOKS:

1. P. K. Gupta, Man Mohan, KantiSwarup: “Operations Research”, Sultan Chand, 2008.
2. V. K. Kapoor: “Operations Research”, Sultan Chand & Sons, 2006
3. J. K. Sharma: Operations Research Theory & Applications, Macmillan India Limited, fifth edition.2013

REFERENCE BOOKS:

1. HamdyTaha, Operations Research, 8th Edition, Pearson Education, 2009.
2. Sharma J.K, Operations Research, 3rd Edition, Macmillan Business Books, 2009.
3. Sundaresan V, Ganapathy K.S, Ganesan K, Resource Management Technique- Lakshmi Publications, 2003.
4. Kantiswaroop, Gupta P. K, Man Mohan, Operations Research, 14th Edition, Sultan Chand & Sons, 2008.
5. Kalavathy S, Operations Research, 2nd Edition, Vikas Publications, 2009.

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2. Www.tutorialspoint.com
3. <https://en.wikipedia.org>
4. Www.geeksforgeeks.org
5. www.investopedia.com
6. www.guru99.com

WEB SOURCES

1. <https://www.bbau.ac.in/dept/UIET/EME-601%20Operation%20Research.pdf>
2. <https://thalis.math.upatras.gr/~tsantas/DownLoadFiles/Taha%20-%20Operation%20Research%208Ed.pdf>

V SEM DSE III COMPILER DESIGN 3 0 0
3

COURSE OBJECTIVE: (Employability)

To introduce the major concept areas of language translation and compiler design. To enrich the knowledge in various phases of compiler and its use. To provide essential skills necessary for constructing a compiler

UNIT – I INTRODUCTION

9

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

UNIT – II SYNTAX ANALYSIS 9

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

UNIT – III INTERMEDIATE CODE GENERATION 9

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

UNIT – IV RUN TIME STORAGE 9

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

UNIT – V CODE OPTIMIZATION 9

Code Optimization and Run Time Environments- Introduction– Principal Sources of Optimization – Optimization of basic Blocks – DAG representation of Basic Blocks - Introduction to Global Data Flow Analysis – Runtime Environments – Source Language issues – Storage Organization – Storage Allocation strategies – Access to non-local names – Parameter Passing, Error detection and recovery.

Total No of Hours : 45

COURSE OUTCOMES

On completion of this course, the students will be able to:

- CO1: Understand the optimization process and various runtime environments.

CO2: Understand the role of the parser, writing grammars, context-free grammars and parsing techniques.

CO3: Define about on compilers, phases of compiler, lexical analysis and token specification.

CO4: Describe about code generations, declarations and Boolean expressions.

CO5: Discuss the issues in the design of code generators and the ability to develop a simple code generator.

TEXT BOOKS:

1. Alfred V. Aho, Jeffrey D Ullman, “Compilers: Principles, Techniques and Tools”, Pearson Education Asia, 2008

REFERENCE BOOKS:

1. Allen I. Holub “Compiler Design in C”, Prentice Hall of India, 2003.
2. J.P. Bennet, “Introduction to Compiler Techniques”, Second Edition, Tata McGraw-Hill, 2003.

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4. [Www.geeksforgeeks.org](http://www.geeksforgeeks.org)
5. www.investopedia.com
6. www.guru99.com

WEB SOURCES

1. <https://www3.nd.edu/~dthain/compilerbook/>
2. <https://nptel.ac.in/courses/106/104/106104123/>

UNIT II DECISION TREE LEARNING

9

Decision Tree representation - Appropriate Problems for Decision Tree Learning - Basic Decision tree learning algorithm - Hypothesis space search and Inductive Bias in Decision tree learning - Issues in Decision Tree Learning. ANN: Perceptron's - Back propagation Algorithms.

UNIT III BAYESIAN LEARNING

9

Bayes Theorem and Concept learning - Maximum Likelihood and Least Squared error hypothesis - Maximum Likelihood hypotheses for predicting probabilities - Minimum description Length principle - Bayes optimal classifier - Gibbs algorithm - Naïve Bayes classifier - Bayesian Belief networks -EM algorithm.

UNIT IV ANALYTICAL AND INDUCTIVE LEARNING

9

Analytical learning - Explanation based learning - Inductive Analytical approaches to learning - Using prior knowledge to initialize the hypothesis, to alter the search objective and to augment search operators.

UNIT V REINFORCEMENT LEARNING

9

K - nearest neighbor learning - Locally weighted regression - Radial Basis functions - Case based reasoning - Reinforcement learning: Learning task-Q Learning; Q function - Algorithm for learning Q-convergence - Updating sequence - Temporal difference learning.

Total No of Hours: 45

COURSE OUTCOME

Students will be able to:

- CO1: Classify existing machine learning algorithms.
- CO2: Use systems that use the appropriate graph models of machine learning.
- CO3: Apply the appropriate machine learning strategy for any given problem.
- CO4: Explain supervised, unsupervised or semi-supervised learning algorithms for any given problem.
- CO5: Define supervised, unsupervised and semi-supervised learning.

TEXT BOOK:

1. Tom M Mitchell, "Machine Learning", McGraw Hill, 1st Edition, 2003.

REFERENCE BOOKS:

1. Ethem Alpaydin, "Introduction to Machine Learning", MIT Press, 2nd Edition, 2010.
2. Stephan Marsland, "Machine Learning - An Algorithmic Perspective", Chapman and Hall, 1st Edition, 2009.
3. Nils Nilsson, "Introduction to Machine Learning", MIT Press, 1997.
4. Jude Shavil, Thomas G Dietterich, "Readings in Machine Learning", Morgan Kaufmann Publishers, 1990.8. Peter Harrington, "Machine Learning in Action", DreamTech

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2. <https://alex.smola.org/drafts/thebook.pdf>
3. https://courses.edx.org/asset-v1:ColumbiaX+CSMM.101x+1T2017+type@asset+block@AI_edx_ml_5.1iintro.pdf
4. <https://nptel.ac.in/courses/106/105/106105152/>
5. <http://www.cs.cmu.edu/~tom/mlbook.html>

V SEM DSE IV

BLOCK CHAIN TECHNOLOGY

3 0 0 3

COURSE OBJECTIVE **(Employability)**

To impart the knowledge of by the end of the course, students will be able to Understand how blockchain systems (mainly Bitcoin and Ethereum) work, To securely interact with them, Design, build, and deploy smart contracts and distributed applications, Integrate ideas from blockchain technology into their own projects.

UNIT I: BASICS CONCEPTS

9

Distributed Database, Two General Problem, Byzantine General problem and Fault Tolerance, Hadoop Distributed File System, Distributed Hash Table, ASIC resistance, Turing Complete. • Cryptography: Hash function, Digital Signature - ECDSA, Memory Hard Algorithm, Zero Knowledge Proof.

UNIT II: INTRODUCTION TO BLOCKCHAIN

9

Introduction, Advantage over conventional distributed database, Blockchain Network, Mining Mechanism, Distributed Consensus, Merkle Patricia Tree, Gas Limit, Transactions and Fee, Anonymity, Reward, Chain Policy, Life of Blockchain application, Soft & Hard Fork, Private and Public blockchain.

UNIT III: DISTRIBUTED CONSENSUS

9

Nakamoto consensus, Proof of Work, Proof of Stake, Proof of Burn, Difficulty Level, Sybil Attack, Energy utilization and alternate.

UNIT IV: CRYPTOCURRENCY

9

History, Distributed Ledger, Bitcoin protocols - Mining strategy and rewards, Ethereum - Construction, DAO, Smart Contract, GHOST, Vulnerability, Attacks, Sidechain, Namecoin Cryptocurrency Regulation: Stakeholders, Roots of Bit coin, Legal Aspects- Crypto currency Exchange, Black Market and Global Economy.

UNIT V: BLOCKCHAIN APPLICATIONS

9

Internet of Things-Medical Record Management System-Blockchain in Government and Blockchain Security-Blockchain Use Cases –Finance Tutorial & Practical: Naive Blockchain construction, Memory Hard algorithm - Hashcash implementation, Direct Acyclic Graph, Play with Go-ethereum, Smart Contract Construction, Toy application using Blockchain, Mining puzzles .

Total No of Hours: 45

COURSE OUTCOMES

CO1: Design, build, and deploy a distributed application.

CO2: Explain design principles of Bitcoin and Ethereum.

CO3: Explain Nakamoto consensus.

CO4: Explain the Simplified Payment Verification protocol.

CO5: List and describe differences between proof-of-work and proof-of-stake consensus.

TEXT BOOK:

1. Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Goldfeder. Bitcoin and cryptocurrency technologies: a comprehensive introduction. Princeton University Press, 2016. (Free download available)

REFERENCE BOOKS:

1. Antonopoulos, Mastering Bitcoin: Unlocking Digital Cryptocurrencies
2. Satoshi Nakamoto, Bitcoin: A Peer-to-Peer Electronic Cash System
3. DR. Gavin Wood, "ETHEREUM: A Secure Decentralized Transaction Ledger,"Yellow paper.2014.
4. Nicola Atzei, Massimo Bartoletti, and Tiziana Cimoli, A survey of attacks on Ethereum smart contracts

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3. <https://en.wikipedia.org>
4. Www.geeksforgeeks.org
5. www.investopedia.com
6. www.guru99.com

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1. <https://www.slideshare.net/asrithak/blockchain-technology-ppt>
2. <https://www.slideshare.net/Mithilevsh/blockchain-technology-181440314>
3. <https://scet.berkeley.edu/wp-content/uploads/BlockchainPaper.pdf>

UNIT IV TESTING STRATEGIES

9

Choosing a Load Testing Strategy – Dodging the Bullets – Validating Mission Critical Server Software for Reliability – Probing the Blind Spot – Testing in today’s Business and Usability

UNIT V TESTING METRIX

9

Testing of Web based Applications – Testing of Embedded Software System used in Aerospace Applications – Testing Application for Security – Testing Metrics, Best Practices and Benchmarks

Total No of Hours:

45

COURSE OUTCOME

On successful completion of this course, the student should able to:

- CO1: Use testing tools to test software in order to improve test efficiency and Assess software quality and assurance based on standards.
- CO2: Choose of software testing techniques in commercial environments and Test software to meet requirements of quality.
- CO3: Identify the inputs and deliverables of the testing process and work together as a team in preparing a report.
- CO4: Match attributes and assess the quality, reliability and security of software.
- CO5: Describe software testing techniques in commercial environments and assess the adequacy of test suites using control flow, data flow, and program mutation.

TEXT BOOK

1. Software Testing Effective Methods, Tools and Techniques by Renu Rajani and Pradeep
Oak Tata McGrawHill

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2. [Www.tutorialspoint.com](http://www.tutorialspoint.com)
3. <https://en.wikipedia.org>
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2. <https://home.cs.colorado.edu/~kena/classes/5828/s12/lectures/05-introtesting.pdf>
3. <https://digitalpoint.tech/admin/uploads/4346d933bcfa1d59b368d121f6747980.p>

V SEM DSE IV INTRODUCTION TO CLOUD COMPUTING 3 0 0 3

COURSE OBJECTIVE: **(Employability)**

To impart the knowledge of the field of Cloud Computing, and an in-depth study into its enabling technologies and main building blocks. The course also provides fundamental ideas behind Cloud Computing, the evolution of the paradigm, its applicability; benefits, as well as current and future challenges.

UNIT-I INTRODUCTION TO CLOUD COMPUTING 9

Introduction to Cloud Computing – Move to Cloud Computing – Types of Cloud – Working of Cloud Computing

UNIT-II CLOUD COMPUTING ARCHITECTURE 9

Cloud Computing Technology – Cloud Architecture – Cloud Modeling and Design - Virtualization: Foundation – Grid, Cloud and Virtualization – Virtualization and Cloud Computing.

UNIT-III DATA STORAGE AND CLOUD COMPUTING 9

Data Storage – Cloud Storage – Cloud Storage from LANs to WANs – Cloud Computing Services: Cloud Services – Cloud Computing at Work

UNIT-IV CLOUD COMPUTING AND SECURITY

9

Risks in Cloud Computing – Data Security in Cloud – Cloud Security Services – Cloud Computing Tools: Tools and Technologies for Cloud – Cloud Mashups – Apache Hadoop – Cloud Tools

UNIT – V CLOUD APPLICATIONS

9

Moving Applications to the Cloud – Microsoft Cloud Services – Google Cloud Applications – Amazon Cloud Services – Cloud Applications

Total No of Hours: 45

COURSE OUTCOME

Upon completion of the course, the students will be able to

CO1: Write cloud related applications.

CO2: Evaluate Cloud Services and Set a private cloud.

CO3: Compare the address the core issues of cloud computing such as security, privacy.

CO4: illustrate the architecture, infrastructure and delivery models of cloud computing

CO5: Understand the concepts of Virtualization, cloud architecture and deployment models.

TEXT BOOKS:

1. A.Srinivasan and J.Suresh, “Cloud Computing – A Practical Approach for Learning and Implementation”, Pearson India Publications 2014.

REFERENCE BOOKS:

1. Rajkumar Buyya, James Broberg, Andrzej , “*Cloud Computing: Principles and Paradigms*”, Wiley India Publications 2011.
2. Arshdeep Bahga and Vijay Madisetti ,“*Cloud Computing – A Hands on Approach*”, Universities Press (India) Pvt Ltd. 2014.

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3. <https://en.wikipedia.org>
4. [Www.geeksforgeeks.org](http://www.geeksforgeeks.org)

5. www.javatpoint.com

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1. <https://www.slideshare.net/Agarwaljay/cloud-computing-simple-ppt-41561620>
2. <https://www.dialogic.com/~media/products/docs/whitepapers/12023-cloud-computing-wp.pdf>
3. <https://www.kth.se/social/files/554fa451f276544829be2e5e/9-cloud-computing.pdf>
4. [https://www.javatpoint.com/introduction-to-cloud-computing#:~:text=Cloud%20Computing%20is%20the%20delivery,over%20the%20Cloud%20\(Internet\).&text=They%20also%20provide%20a%20wide,and%20platform%20as%20a%20service.](https://www.javatpoint.com/introduction-to-cloud-computing#:~:text=Cloud%20Computing%20is%20the%20delivery,over%20the%20Cloud%20(Internet).&text=They%20also%20provide%20a%20wide,and%20platform%20as%20a%20service.)
5. <https://nptel.ac.in/courses/106105167/>

V SEM DSE LAB

MOBILE APP LAB

0 0 4 2

COURSE OBJECTIVE: Skill Development

The ANDROID Application Development Lab needed to implement rich Android applications for the Android mobile platform. Student will build the code, compile, execute, and debug mobile applications using the Java for Android programming language and Eclipse to develop programs using advanced programming concepts

LIST OF PROGRAMS

1. Introduction to mobile technologies and devices
- 2 Android platform and applications overview
- 3 Setting Android development environments
- 4 Writing Android applications
- 5 Essentials of Android user interface design
6. User interface design elements, events, and dialogs
7. User interface design layouts
8. Working with texts and shapes
9. Working with animations
- 10 .Using Android location based APIs
- 11 .Using Android storage APIs
- 12 .Using Android web APIs

Total No of Hours :30

COURSE OUTCOMES:

Upon the successful completion of the course, learners will be able to

CO1-demonstrate the android features and create, develop using android.

CO2-Demonstrate and Understanding anatomy of an Android application.

CO3-Apply the android geo location based services.

CO4-Illustrate the android wifi features and advance android development.

CO5-Demonstrate the Linux security and implement ADL interface.

TEXT BOOKS:

1. T1. Lauren Darcey and Shane Conder, “Android Wireless Application Development”, Pearson Education, 2nd ed. (2011)

REFERENCE BOOKS:

1. Reto Meier, “Professional Android 2 Application Development”, Wiley India Pvt Ltd
2. Mark L Murphy, “Beginning Android”, Wiley India Pvt Ltd
3. Android Application Development All in one for Dummies by Barry Burd, Edition: I

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2. <https://mrcet.com/pdf/Lab%20Manuals/IT/R15A0563%20MAD.pdf>
3. <https://www.mediapiac.com/uploads/conference/presenters/documents/17/8.pdf>
4. <https://lecturenotes.in/subject/465/mobile-application-development>

V SEM DSE LAB

SOFTWARE TESTING LAB

0 0 4

2

COURSE OBJECTIVE: Skill Development

- To describe the principles of system and component testing
- To describe strategies for generating system test cases
- To understand the essential characteristics of tool used for test automation

LIST OF PROGRAMS

1. Develop a Software Requirements Specification for “Hotel Management System. / BookStore Management System”.
2. Develop a Software Requirements Specification for “Online ticket booking system”
3. To generate unit testing report for Online Ticket booking system
4. Perform black box testing Hotel / Bookstore management system
 - (i) Using equivalence class partitioning method
 - (ii) Using boundary value analysis (BVA) method
5. Perform white box testing for Online Ticket booking system
 - (i) Using branch coverage method.
 - (ii) Using path coverage method
 - a. Control Flow Graph
 - b. Cyclomatic Complexity
 - c. Independent paths
 - d. Test Cases table
 - e. Test matrix
 - (iii) Using Condition coverage Method.

Total No of Hours : 30

COURSE OUTCOMES:

On successful completion of this course, the student should able to,

CO1: Learn basic concepts of software testing, for generating strategies to derive test cases for software testing.

CO2: Conduct tests at various levels to check the flow of data and control, and to check the code after integrating.

CO3: Understand quality of software at thread levels by identifying faults of omission and faults of commission.

CO4: Plan and monitor the development of software systematically using software specification and design document.

- CO5: Understand Test process and continuous quality improvement

TEXT BOOK

1. Software Testing Effective Methods, Tools and Techniques by Renu Rajani and Pradeep
Oak Tata McGrawHill

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2. <https://home.cs.colorado.edu/~kena/classes/5828/s12/lectures/05-introtesting.pdf>
3. <https://digitalpoint.tech/admin/uploads/4346d933bcfa1d59b368d121f6747980.pdf>

VI
SEMESTER

COURSE OBJECTIVES**(Employability)**

- To know the fundamental concepts of big data and analytics.
- To explore tools and practices for working with big data
- To learn about stream computing.
- To know about the research that requires the integration of large amounts of data.

UNIT I INTRODUCTION TO BIG DATA**9**

Evolution of Big data - Best Practices for Big data Analytics - Big data characteristics- Characteristics of Big Data Applications-Understanding Big Data Storage - A General Overview of High-Performance Architecture - HDFS - Map Reduce and YARN. - Map Reduce Programming Model.

UNIT II CLUSTERING AND CLASSIFICATION**9**

Advanced Analytical Theory and Methods: Overview of Clustering - K-means-Overview of the Method - Determining the Number of Clusters -Classification: Decision Trees - Overview of a Decision Tree - The General Algorithm - Decision Tree Algorithms - Evaluating a Decision Tree - Decision Trees in R - Naïve Bayes - Bayes' Theorem - Naïve Bayes Classifier.

UNIT III ASSOCIATION AND RECOMMENDATION SYSTEM**9**

Advanced Analytical Theory and Methods: Association Rules - Overview - Apriori Algorithm - Evaluation of Candidate Rules - Applications of Association Rules - Finding Association & finding similarity - Recommendation System: Collaborative Recommendation- Content Based Recommendation - Knowledge Based Recommendation- Hybrid Recommendation Approaches.

UNIT IV GRAPH MEMORY AND STREAM MEMORY**9**

Using Graph Analytics for Big Data: Graph Analytics - The Graph Model -Representation as Triples - Graphs and Network Organization - Choosing Graph Analytics -Features of a

Graph Analytics Platform - Introduction to Streams Concepts – Stream Data Model and Architecture - Stream Computing, Sampling Data in a Stream – Filtering Streams – Counting Distinct Elements in a Stream – Estimating moments.

UNIT V BIG DATA AND VISUALIZATION

9

NoSQL Databases : Schema-less Models: Increasing Flexibility for Data Manipulation- Key Value Stores- Document Stores - Tabular Stores - Object Data Stores - Graph Databases Hive - Sharding -- Hbase .

Total No of Hours : 45

COURSE OUTCOME

Upon completion of the course, the students will be able to:

CO1:Develop NoSQL databases and management.

CO2:Compare the tools for visualization

CO3:Demonstrate an efficient recommendation system

CO4:Use efficient algorithms for mining the data from large volumes

CO5:Understand big data tools and its analysis techniques

TEXT BOOKS:

1. AnandRajaraman and Jeffrey David Ullman, "Mining of Massive Datasets", Cambridge University Press, 2012.
2. DavidLoshin, "Big Data Analytics: From Strategic Planning to Enterprise Integration with Tools, Techniques, NoSQL, and Graph", 2013.

REFERENCE BOOKS:

1. EMC Education Services, "Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data", Wiley publishers, 2015.
2. BartBaesens, "Analytics in a Big Data World: The Essential Guide to Data Science and its Applications", Wiley Publishers, 2015.

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1. <http://index-of.co.uk/Big-Data-Technologies/Data%20Science%20and%20Big%20Data%20Analytics.pdf>
2. https://mrcet.com/downloads/digital_notes/CSE/IV%20Year/BIG%20DATA%20ANALYSIS%20NOTES.pdf
3. https://www.jigsawacademy.com/em/Beginners_Guide_to_Analytics.pdf

VI SEM DSE VMICROPROCESSOR AND ITS APPLICATION 3 0 0

3

COURSE OBJECTIVE:

(Employability)

This course introduces the basic concepts of microprocessor. The objective of this course is to provide extensive knowledge of microprocessor based systems and interfacing techniques.

UNIT I INTRODUCTION 9

Introduction to Micro Computers, Microprocessors and Assembly Languages – Microprocessor architecture and its operations – 8085 MPU – 8085 Instruction set and classifications.

UNIT II TECHNIQUES 9

Writing assembly level programs – Programming techniques such as looping, counting and indexing addressing modes – Data transfer instructions – Arithmetic and Logic operations – Dynamic debugging.

UNIT III COUNTERS/TIME DELAYS 9

Counters and Time delays – Hexadecimal counter – Modulo 10 counter – Pulse Timings for flashing lights – Debugging counter and time delay program – stack – Subroutine – conditional call and return instructions.

UNIT IV CONVERSIONS 9

BCD to Binary and Binary to BCD conversions – BCD to HEX and HEX to BCD conversions ASCII to BCD and BCD to ASCII conversions – BCD to seven segment LED Code conversions – Binary to ASCII and ASCII to Binary conversions – Multibyte Addition – Multibyte subtraction – BCD addition – BCD Subtraction – Multiplication and Division.

UNIT V INTERRUPT 9

Interrupt – Implementing interrupts – Multiple interrupt – 8085 – trap – Problems on implementing 8085 interrupt – DMA – Memory interfaces – Ram & Rom – I/O interface – Direct I/O – Memory mapped I/O.

Total No of Hours :

COURSE OUTCOME

Upon completion of the course, the students will be able to:

- CO1: Develop skill in simple program writing for 8085 and applications.
- CO2: Analyze about counters and Acquire knowledge about DMA
- CO3: Distinguish between RISC and CISC processors.
- CO4: Understand the basic idea about the data transfer schemes and its applications
- CO5: Understand the architecture of 8085

TEXT BOOK

1. R.S. Gaonkar, "Microprocessor Architecture, programming and Application with 8085/8085A", Wiley Eastern Limited, 2000.

REFERENCE BOOK:

1. Mathur, "Introduction to Microprocessor", Third Edition, Tata McGraw- Hill Publishing Co.

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2. [Www.tutorialspoint.com](http://www.tutorialspoint.com)
3. <https://en.wikipedia.org>
4. [Www.geeksforgeeks.org](http://www.geeksforgeeks.org)
5. www.investopedia.com
6. www.guru99.com

WEB SOURCES

1. https://www.vssut.ac.in/lecture_notes/lecture1423813120.pdf
2. <http://cde.annauniv.edu/McAQP/pdf/MCA%20MODEL%20QUESTIONS%20FEB-2010/Third%20Semester/DMC1932/DMC1932.pdf>
3. https://www.academia.edu/4706727/Microprocessor_and_its_Applications_EC3

VI SEM DSE V

E COMMERCE

3 0 0

COURSE OBJECTIVE: Entrepreneurship

- To obtain knowledge of Internet hardware associated with E-commerce systems.
- Gain knowledge of selected Standard application commonly used in business
- Ability to design a fundamental E-Business concept and Gain knowledge of the issues of network security and business-tech protocols.
- Introduction to Business graphics – with focus on advertising philosophy.

UNIT I ELECTRONIC COMMERCE ENVIRONMENT

9

Background-The Electronic Commerce Environment – Electronic Market place Technologies-Modes of Electronic Commerce: Overview –Electronic Data Interchange-Migration To Open EDI – Electronic Commerce Going Forward.

UNIT II APPROACHES TO SAFE ELECTRONIC COMMERCE 9

Overview- Secure Transport Protocols – Secure Transactions –Secure Electronic Payment Protocol (SEPP)-Secure Electronic Transaction (SET) – Certificates for Authentication – Security On Web Servers and Enterprise Networks- Electronic Cash and Electronic Payment Schemes: Internet Monetary Payment and Security Requirements –Payment and Purchase Order – On-line Electronic Cash.

UNIT III INTERNET/INTRANET SECURITY ISSUES AND SOLUTIONS 9

The Need for Computer Security –Specific Intruder Approaches –Security Strategies – Security Tools – Encryption –Enterprise Networking and Access to the Internet –Antivirus Programs- Security Teams.

UNIT IV MASTERCARD/VISA SECURE ELECTRONIC TRANSACTION 9

Introduction- Business Requirements- Concepts- Payment Processing- E-mail and Secure E-mail Technologies for Electronic Commerce: Introduction – The Means of Distribution- A Model for Message handling – How Does E-mail Work? –MIME: Multipurpose Internet Mail Extensions – S/MIME: Secure Multipurpose Internet Mail Extensions – MOSS: Message Object Security Services – Comparisons of Methods –MIME and Related Facilities for EDI over the Internet.

UNIT V INTERNET AND WEB SITE ESTABLISHMENT

Introduction- Technologies for Web Servers –Internet Tools Telecast to Commerce – Internet Applications for Commerce- Internet Charges- Internet Access and Architecture –Searching the Internet- Internet Resources: A Travelogue of Web Mails: Introduction- A Shopping Experience – A Travelogue –Applications: Advertising on the Internet: Issues and Technologies: Introduction Advertising on the Web –“Marketing 101”-Creating a Web Site.

Total No of Hours:

45

COURSE OUTCOME

On completion of this , students can able to

CO1: Creation, evaluation and administration of computer system

CO2: Identify & Analyze User needs

CO3: Integrate IT based solutions

CO4: Use current techniques, tools and skills

CO5: Understand the basic concepts.

TEXT BOOKS

1. Abirami devi.K ,” E-Commmerce “, Margham publications , 2009.
2. Chatterjee , Indira , “E-Commmerce” , Scitech publications , 2010.

REFERENCE BOOK

1. Nandankamath ,“Law Relating To Computers ,Internet And E-Com “ , universal law publications.

WEB SITES

1. Wwww.w3schools.com
2. Wwww.tutorialspoint.com
3. <https://en.wikipedia.org>
4. Wwww.geeksforgeeks.org
5. www.investopedia.com
6. ww.guru99.com

WEBSOURCES

1. <https://irp-cdn.multiscreensite.com/1c74f035/files/uploaded/introduction-to->

[e-commerce.pdf](#)

2. <https://www.slideshare.net/munishsingla71/e-commerce-ppt-10713485>

COURSE OBJECTIVE:

(Employability)

- This course introduces the concepts of Life Cycle of Software.
- To Understand the Software Engineering Practice & Process Models.
- To Understand Design Engineering, Web applications and Software Project Management.

UNIT I INTRODUCTION

9

Introduction to Software Engineering: Definitions – Size Factors- Quality and Productivity Factors – Managerial Issues- Planning a software Project: Defining the Problem – Developing a Solution – Strategy – Planning the Development Process – Planning an Organization Structure – Other Planning Activities.

UNIT II SOFTWARE COST ESTIMATION

9

Software cost factors – Software Cost Estimation Techniques – Staffing – Level Estimation – Estimating Software Maintenance Costs – The Software Requirements Specification – Formal Specification Techniques – Languages and Processors for Requirements Specification.

UNIT III SOFTWARE DESIGN

9

Fundamental Design Concepts – Modules and Modularization Criteria – Design Notations – Design Techniques – Detailed Design Considerations – Real-Time and Distributed System Design – Test Plans – Milestones, Walkthroughs, and Inspections.

UNIT IV IMPLEMENTATION ISSUES

9

Structured Coding Techniques – Coding Style – Standards and Guidelines – Documentation guidelines – Type checking – Scoping Rules – Concurrency Mechanism.

UNIT V QUALITY ASSURANCE

9

Quality Assurance – Walkthroughs and Inspections – Static Analysis – Symbolic Execution – Unit Testing and Debugging – System Testing – Formal

Verification:Enhancing Maintainability during Development – Managerial aspects of SoftwareMaintenance – Source Code Metrics – Other Maintenance Tools and Techniques.

**Total No of Hours
:45**

COURSE OUTCOME

At the end of this course, students will be able to:

- CO1: Plan for good software engineering practices such as incremental development, data integrity checking and adherence to style guidelines.
- CO2: Analyze the problem of implementation issues, and to understand the standards and guidelines.
- CO3: Recommend knowledge about the software design concepts and able to judge the real time and distributed system.
- CO4: Use the cost estimation of software concept and differentiate software requirement specification techniques.
- CO5: Understand the software engineering factors and able to recognize a solution strategy for planning the development process.

TEXT BOOKS

1. R.S.Pressman,Software Engineering , Fourth Ed , McGraw Hill,2007 1997 Edition

REFERENCE BOOKS:

1. R.E Fairely , “Software Engineering Concepts”, Tata McGraw Hill Publication 2001.
2. Richard Fairley, “Software Engineering Concepts”, TATA Mc GRAW Hill Edition.

WEB SITES

1. Www.w3schools.com
2. Www.tutorialspoint.com
3. <https://en.wikipedia.org>
4. Www.geeksforgeeks.org
5. www.investopedia.com
6. www.guru99.com

WEB SOURCES

1. https://www.vssut.ac.in/lecture_notes/lecture1428551142.pdf
2. https://www.darshan.ac.in/Upload/DIET/Documents/CE/2160701_Software%20Engineering%20Study%20Material%20GTU_23042016_032444AM.pdf
3. <https://examstime.in/software-engineering-study-materials/>

COURSE OBJECTIVES:

(Employability)

- ❖ To understand the various characteristics of intelligent agents. To learn about the different search strategies in AI. To learn to represent knowledge in solving AI problems. To understand the different ways of designing software agents. To know about the various applications of AI.

UNIT I INTRODUCTION

9

Introduction–Definition - Future of Artificial Intelligence – Characteristics of Intelligent Agents–Typical Intelligent Agents – Problem Solving Approach to Typical AI problems.

UNIT II PROBLEM SOLVING METHODS

9

Problem solving Methods - Search Strategies- Uninformed - Informed - Heuristics - Local Search Algorithms and Optimization Problems - Searching with Partial Observations - Constraint Satisfaction Problems – Constraint Propagation - Backtracking Search - Game Playing - Optimal Decisions in Games – Alpha - Beta Pruning - Stochastic Games

UNIT III KNOWLEDGE REPRESENTATION

9

First Order Predicate Logic – Prolog Programming – Unification – Forward Chaining- Backward Chaining – Resolution – Knowledge Representation - Ontological Engineering- Categories and Objects – Events - Mental Events and Mental Objects - Reasoning Systems for Categories - Reasoning with Default Information

UNIT IV SOFTWARE AGENTS

9

Architecture for Intelligent Agents – Agent communication – Negotiation and Bargaining – Argumentation among Agents – Trust and Reputation in Multi-agent systems.

UNIT V APPLICATIONS

9

AI applications – Language Models – Information Retrieval- Information Extraction – Natural Language Processing - Machine Translation – Speech Recognition – Robot – Hardware – Perception – Planning – Moving.

Total No of Hours
:45

COURSE OUTCOME

Upon completion of the course, the students will be able to:

- CO1: Design applications for NLP that uses Artificial Intelligence.
- CO2: Design software agents to solve a problem.
- CO3: Differentiate the apt agent strategy to solve a given problem.
- CO4: Relate a problem using first order and predicate logic.
- CO5: Use appropriate search algorithms for any AI problem.

TEXT BOOKS:

1. S. Russell and P. Norvig, Artificial Intelligence: A Modern Approach, Prentice Hall, Third Edition, 2009.
2. I. Bratko, Prolog: Programming for Artificial Intelligence, Fourth edition, Addison-Wesley Educational Publishers Inc., 2011.

REFERENCE BOOKS:

1. M. Tim Jones, Artificial Intelligence: A Systems Approach (Computer Science) , Jones and Bartlett Publishers, Inc.; First Edition, 2008
2. Nils J. Nilsson, The Quest for Artificial Intelligence, Cambridge University Press, 2009.

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3. <https://en.wikipedia.org>
4. [Www.geeksforgeeks.org](http://www.geeksforgeeks.org)

5. www.investopedia.com

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1. https://www.vssut.ac.in/lecture_notes/lecture1428643004.pdf
2. <https://stacks.stanford.edu/file/druid:qn160ck3308/qn160ck3308.pdf>
3. https://www.dcehvp.com/E-Content/BCA/BCA-III/artificial_intelligence_tutorial.pdf
4. https://cisse.info/pdf/2019/rr_01_artificial_intelligence.pdf

VI SEM DSE VI IOT AND ITS APPLICATIONS 3 0 0
3

COURSE OBJECTIVES

Cisco IoT system – IBM Watson IoT platform – Manufacturing – Converged Plantwide Ethernet Model (CPwE) – Power Utility Industry – GridBlocks Reference Model – Smart and Connected Cities: Layered architecture, Smart Lighting, Smart Parking Architecture and Smart Traffic Control.

Total No of Hours :

45

COURSE OUTCOMES

Upon completion of the course, the students will be able to:

- CO1: Explain building blocks of Internet of Things and characteristics.
- CO2: Identify Cloud & Sensor Networks
- CO3: Identify the revolution of Internet in Mobile Devices.
- CO4: Understand the application areas of IOT
- CO5: Describe the fundamentals of IOT

TEXTBOOK:

1. David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Rob Barton and Jerome Henry, —IoT Fundamentals: Networking Technologies, Protocols and Use Cases for Internet of Things, Cisco Press, 2017

REFERENCES:

1. ArshdeepBahga, Vijay Madiseti, —Internet of Things – A hands-on approach, Universities Press, 2015
2. Olivier Hersent, David Boswarthick, Omar Elloumi , —The Internet of Things – Key applications and Protocols, Wiley, 2012 (for Unit 2).
3. Jan Ho" ller, VlasiosTsiatsis , Catherine Mulligan, Stamatis , Karnouskos, Stefan Avesand. David Boyle, "From Machine-to-Machine to the Internet of Things – Introduction to a New Age of Intelligence", Elsevier, 2014.
4. Dieter Uckelmann, Mark Harrison, Michahelles, Florian (Eds), —Architecting the Internet of Things, Springer, 2011.
5. Michael Margolis, Arduino Cookbook, Recipes to Begin, Expand, and Enhance Your Projects, 2nd Edition, O'Reilly Media, 2011.

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2. Www.tutorialspoint.com
3. <https://en.wikipedia.org>
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2. https://www2.deloitte.com/content/dam/Deloitte/in/Documents/technology-media-telecommunications/in-tmt-IoT_TheRiseoftheconnectedworld-28aug-noexp.pdf

VI SEM DSE VII DOT NET PROGRAMMING
4

3 0 2

COURSE OBJECTIVE:

(Employability)

1. To inculcate knowledge on .NET technology and concepts.
2. To understand the concepts of C# Windows Controls
3. This syllabus is aimed to impart a basic understanding of how computers communicate using different devices and protocol.

UNIT 1 INTRODUCTION TO .NET

12

Introduction to .NET Framework - .NET Advantages - Common Language Runtime(CLR) -Common Type System (CTS) - .NET Framework Class Library (FCL) - Microsoft Intermediate Language(MSIL) - Just In Time(JIT) Compiler - Garbage Collection - Phases of Garbage Collection.

UNIT2 C# BUILDING BLOCKS

12

Introduction to C# –Overview - OOPS Concepts: Expressions- Declarations – Statements - Data types - Operators – Decision Making – Looping - Constructors and Destructors – Inheritance.

UNIT 3 C# WINDOWS CONTROLS

12

Button -Textbox -RichTextBox -Label, LinkLabel -CheckBox -RadioButton - ListBox -ComboBox -TreeView -CheckedListBox -Panel -GroupBox - PictureBox -ToolTip -ErrorProvider – Menu Controls -Common Dialogs -Date TimePicker -MonthCalendar.

UNIT 4 ASP.NET CONTROLS

12

Introduction of ASP.NET - Concept of Web Applications - ASP.NET Architecture - ASP.NET Page Life Cycle - ASP.NET Controls: Check box list – radio button list – drop down list – list box – Ad Rotator control - Required Field Validator control- Compare Validator Control – Range Validator Control – Custom Validator Control – Validation Summary Control.

UNIT 5OBJECTS AND ADVANCED CONCEPTS IN ASP.NET

12

Introduction to ADO.NET – ADO Vs ADO.NET – Connected ADO.NET Architecture – Disconnected ADO.NET Architecture – ADO.NET Data Providers -Data Reader - Data Adapter – ADO.NET Classes - Request Object - Response Object – State Management for Session,Application, Cookies, and Query String.

TOTAL HOURS: 60

COURSE OUTCOME

On successful completion of this course, the student should able to,

- CO1: Create Crystal Reports and Access data using ADO.NET
- CO2: Analyze the XML Documents
- CO3: Compare the applications using Microsoft Windows® Forms
- CO4: Apply basic logic of C# code.
- CO5: Understand the principles of object-oriented programming.

TEXT BOOK

1. Joe Duffy, Professional **.NET Framework 2.0 2006 Edition**- Wrox Publications

REFERENCE BOOKS

1. Steven Holzner, Visual Basic.NET Programming – **Black Book 2005 Edition**,- Paraglyph Press and DreamTech Press
2. Alex, Professional ASP.NET 1.1 - Homler and Group Wrox Publications
3. Michael Otey and DenielleOtey ADO.NET Complete Reference Tata Macraw Hill Publication

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2. [Www.tutorialspoint.com](http://www.tutorialspoint.com)
3. [Www.javatpoint.com](http://www.javatpoint.com)
4. [Www.geeksforgeeks.org](http://www.geeksforgeeks.org)

WEB SOURCES

1. http://www.mentor.com/docs/Traindocs/dotNET_Tutorial_for_Beginners.pdf
2. <https://tuto-computer.com/programming/31-introduction-vbnet.html>
3. <https://www.slideshare.net/samirbhogayta/introduction-to-dotnet>

COURSE OBJECTIVES:

(Employability)

- To learn the fundamentals of natural language processing
- To understand the use of CFG and PCFG in NLP
- To understand the role of semantics of sentences and pragmatics
- To apply the NLP techniques to IR applications

UNIT I INTRODUCTION

12

Origins and challenges of NLP – Language Modeling: Grammar-based LM, Statistical LM – Regular Expressions, Finite-State Automata – English Morphology, Transducers for lexicon and rules, Tokenization, Detecting and Correcting Spelling Errors, Minimum Edit Distance

UNIT II WORD LEVEL ANALYSIS

12

Unsmoothed N-grams, Evaluating N-grams, Smoothing, Interpolation and Backoff – Word Classes, Part-of-Speech Tagging, Rule-based, Stochastic and Transformation-based tagging, Issues in PoS tagging – Hidden Markov and Maximum Entropy models.

UNIT III SYNTACTIC ANALYSIS

12

Context-Free Grammars, Grammar rules for English, Treebanks, Normal Forms for grammar – Dependency Grammar – Syntactic Parsing, Ambiguity, Dynamic Programming parsing – Shallow parsing – Probabilistic CFG, Probabilistic CYK, Probabilistic Lexicalized CFGs – Feature structures, Unification of feature structures.

UNIT IV SEMANTICS AND PRAGMATICS

12

Requirements for representation, First-Order Logic, Description Logics – Syntax-Driven Semantic analysis, Semantic attachments – Word Senses, Relations between Senses, Thematic Roles, selectional restrictions – Word Sense Disambiguation, WSD using

Supervised, Dictionary & Thesaurus, Bootstrapping methods – Word Similarity using Thesaurus and Distributional methods.

UNIT V DISCOURSE ANALYSIS AND LEXICAL RESOURCES 12

Discourse segmentation, Coherence – Reference Phenomena, Anaphora Resolution using Hobbs and Centering Algorithm – Coreference Resolution – Resources: Porter Stemmer, Lemmatizer, Penn Treebank, Brill’s Tagger, WordNet, PropBank, FrameNet, Brown Corpus, British National Corpus (BNC).

Total No of

Hours :60

COURSE OUTCOMES

On completion of this course, the students will be able to

CO1: Summarize the information retrieval techniques.

CO2: Describe the semantic and syntactic words of natural language.

CO3: Explain the machine translation

CO4: Experiment Semantic Analysis.

CO5: Identify the basic terminology of natural language.

TEXT BOOKS:

1. Daniel Jurafsky, James H. Martin—Speech and Language Processing: An Introduction to Natural Language Processing, Computational Linguistics and Speech, Pearson Publication, 2014.
2. Steven Bird, Ewan Klein and Edward Loper, —Natural Language Processing with Python, First Edition, OReilly Media, 2009.

REFERENCES:

1. Breck Baldwin, —Language Processing with Java and LingPipe Cookbook, Atlantic Publisher, 2015.
2. Richard M Reese, —Natural Language Processing with Java, OReilly Media, 2015.
3. Nitin Indurkha and Fred J. Damerau, —Handbook of Natural Language Processing, Second Edition, Chapman and Hall/CRC Press, 2010.
4. Tanveer Siddiqui, U.S. Tiwary, —Natural Language Processing and Information Retrieval, Oxford University Press, 2008.
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3. <https://en.wikipedia.org>
4. [Www.geeksforgeeks.org](http://www.geeksforgeeks.org)

WEB SOURCES

1. <https://www.slideshare.net/HansiThenuwara/natural-language-processing-64271235>
2. <http://www.datascienceassn.org/sites/default/files/Natural%20Language%20Processing%20with%20Python.pdf>
3. <https://london.ac.uk/sites/default/files/study-guides/introduction-to-natural-language-processing.pdf>

COURSE OBJECTIVE:

(Employability)

- Provide the student with the fundamentals of digital image processing.
- Introduce the students to some advanced topics in digital image processing should time permit.
- Give the students a useful skill base that would allow them to carry out further study should they be interested and to work in the field.

UNIT I INTRODUCTION

12

Introduction: Digital Image representation - Fundamental steps in Image Processing - Elements of Digital Image Processing Systems - Sampling and Quantization - Basic relationships between pixels - Imaging Geometry - Transformation Technology- Image processing methods: Image Enhancement: The Spatial Domain Methods, The Frequency Domain Methods - Image Restoration: Basic Framework, Interactive Restoration, Image deformation and geometric transformations, image morphing, Restoration techniques, Noise characterization, Noise restoration filters, Adaptive filters, Linear, Position invariant degradations,

UNIT II STEGNOGRAPHY

12

Introduction: Information Hiding: Steganography and Watermarking – Differences between Watermarking and Steganography History of watermarking – Importance of digital watermarking – Applications – Properties – Evaluating watermarking systems. Classification in Digital Watermarking: Classification Based on Characteristics: Blind versus Non blind, Perceptible versus Imperceptible, Private versus Public, Robust versus, Fragile, Spatial Domain-Based versus Frequency Domain-Based.

UNIT III WATERMARKING

12

Digital Watermarking techniques : Spatial domain –Frequency domain : Discrete Fourier Transform – Discrete Cosine Transform –Discrete Wavelet Transform - An Overview of Adjusted-Purpose Digital Watermarking, The Morphological Approach of Extracting

WEB SITES

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2. [Www.tutorialspoint.com](http://www.tutorialspoint.com)
3. <https://en.wikipedia.org>
4. [Www.geeksforgeeks.org](http://www.geeksforgeeks.org)
5. www.investopedia.com

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1. http://sdeuoc.ac.in/sites/default/files/sde_videos/Digital%20Image%20Processing%203rd%20ed.%20-%20R.%20Gonzalez%2C%20R.%20Woods-ilovepdf-compressed.pdf
2. <https://udesa.cristianreynaga.com/assets/bibliografia/DigitalImageProcessing.pdf>

**SKILL
ENHANCEMENT
COURSE
(SEC)**

21SSKU11

SOFT SKILL – I

2 0 0

2

COURSE OBJECTIVE: Skill Development

- To train the students to improve the vocabulary and reading comprehension.
- To train the students to participate in group discussion
- To elevate their comprehension skills and conversation.

UNIT I: EFFECTIVE COMMUNICATION SKILLS 06

Talking about your company – Making Polite requests – Introducing yourself and others – Socialising with others – Talking about work activities – Talking about your job

– Communication practice – Role plays

UNIT II: WRITTEN BUSINESS COMMUNICATION 06

Essential Email writing skills – Formal and Informal E-mails – Usage of formal language – Report Writing – Writing project reports – Extended writing practice – Email Etiquette – Understanding Business E-mails

UNIT III: TELEPHONE ETIQUETTE 06

The basics of Telephone Etiquette – Customer Service – Being courteous – Making arrangements – Giving clear and concise information – Tone and Rate of speech – Pronunciations – Summarisation – Mock Telephonic Conversations

UNIT IV: LEADERSHIP SKILLS 06

Essential Leadership Skills – Interpersonal Skills – Team Building – Team work – Do's and Don'ts of Leadership skills – Importance of communication in Leadership – Delegating and Handling of Projects

UNIT V: LISTENING AND ANSWERING QUESTION 06

Listening for the main ideas – Listening for details – Listening for specific information – Predicting and listening for opinions – Recognising context – Listening for sequence – Understanding Pronunciation – Listening practice

Total No of Hours: 30

Hours

COURSE OUTCOME

On Completion of this course, students can able to

CO1:To enhance participant's Business Communication Skills

CO2:To enhance the participant's Reading, Speaking, Listening and Writing capabilities

CO3:To engage in a conversation with others to exchange ideas

CO4:To impart leadership qualities among the participants

CO5:To express opinions to enhance their social skills

TEXT BOOKS

1. Raman, M. & Sangeeta Sharma. Technical Communication.OUP.2008
2. Taylor, Grant.English Conversation Practice. Tata McGraw Hill Education Pvt. Ltd. 2005
3. Tiko, Champa & Jaya Sasikumar. Writing with a Purpose.OUP. New Delhi. 1979

WEB SOURCES

- <https://www.skillsyouneed.com/ips/communication-skills.html>
- <https://blog.smarp.com/top-5-communication-skills-and-how-to-improve-them>
- <https://blog.hubspot.com/service/phone-etiquette>

21SSKU21

SOFT SKILL-II

2 0 0 2

COURSE OBJECTIVE : Skill Development

- To train the students to improve their skills.
- To teach them soft skills and strength their foundation in time and stress management
- To elevate their interview skills

UNIT I: READING COMPREHENSION AND VOCABULARY 06

Reading Techniques – Types of Reading – Skimming – Scanning – Reading for detail – Identifying key words – Underlining unfamiliar key words – Vocabulary Building – Reading Comprehension practice

UNIT II: PRESENTATION SKILLS 06

Presentation Methods – Preparation and Practice – Organising content – Do's and Don'ts of a Presentation – Presentation Techniques – Mock Presentation

UNIT III: GROUP DISCUSSION 06

Introduction to Group Discussion – Preparation for GD – Structure of GD's – Do's and Don'ts – Tips and Strategies – Etiquette and Practice – Body Language and Posture – Sharing Ideas with respect – Understanding Opinions – Mock GD Practice

UNIT IV: CONVERSATIONAL SKILLS 06

Introduction to Small talk – How to start and end a conversation – Exchanging ideas – Expressing Interests – Giving Opinions – Social skills and Etiquette – Informal Conversations – Formal Meetings – Group Practice

UNIT V: SELF – INTRODUCTION AND ROLE PLAY 06

Introducing oneself – Exchange of Greetings – Appropriate Greetings – Usage of Vocabulary – Rapport Building – Handshakes and First Impressions – Basic Etiquette

**Total No of Hours: 30
Hours**

COURSE OUTCOME:

On Completion of this course, students are able to

- CO1: To get students to understand the importance of communicating in English
CO2: To understand effective communication techniques
CO3: To increase self-confidence through regular practice

CO4: To encourage active participation in their regular class

CO5: To enable participants to face large group of audience with confidence

TEXT BOOKS

1. English for Competitive Examinations by R.P.Bhatnagar&Rajul BhargavaMacmillan India ltd. Delhi.
2. Carnegie, Dale. The Quick and Easy Way to Effective Speaking. New York: Pocket Books, 1977.
3. Kalish, Karen.How to Give a Terrific Presentation. New York: AMACOM, 1996

WEB SOURCES

1. <https://www.skillsyouneed.com/ips/communication-skills.html>
2. <https://venngage.com/blog/presentation-skills/>
3. <https://gdpi.hitbullseye.com/Group-Discussion.php>

COURSE OBJECTIVE: Skill Development

- To enable students to develop their soft skills and Body Language
- To enhance students Reading, Writing, Listening and Speaking skills
- To develop their self-confidence to excel at Interviews

Credit Hours

UNIT I: SKILL ENHANCEMENT 06

Time Management – Planning and Organisation – Scheduling – Prioritization – Delegation – Task Management – Stress Management – Overcoming anxiety – Confidence Building – Body Language

UNIT II: RESUME / COVER LETTER WRITING 06

SWOT Analysis – Details and Resume Writing – Resume Examples – Building Resume using SWOT – Writing Resume – Writing Cover Letter – Resume Correction – Resume Feedback

UNIT III: INTERVIEW SKILLS 06

Interview Do's and Don'ts – First Impression – Grooming – Body Language – Frequently asked questions – Useful Language – Mock Interview

UNIT IV: QUANTITATIVE ABILITY 06

Permutation & Combinations – Probability – Profit & Loss – Ratio Proportions & Variations – Cubes – Venn Diagrams – Logical Reasoning – Critical Reasoning

UNIT V: REVISIONARY MODULES 06

Group Discussions – HR Process – Interview Process – Mock Group Discussions

Total No of Hours:

30

COURSE OUTCOME

On Completion of this course, students can able to

CO1:To develop participant's social and professional skills

CO2:To help participants manage time effectively

CO3:To build a strong resume to suit corporate requirements

CO4:To face interviews confidently

CO5:To enhance their aptitude abilities

TEXTBOOKS

1. Meena. K and V.Ayothi (2013) A Book on Development of Soft Skills (Soft Skills: A Road Map to Success) P.R. Publishers & Distributors.
2. Soft Skills – Know Yourself & Know the World, S.Chand & Company LTD, Ram Nagar, NewDelhi
3. Prasad, H. M. How to Prepare for Group Discussion and Interview. NewDelhi: Tata McGraw-Hill Publishing Company Limited, 2001.
4. Pease, Allan. Body Language. Delhi: Sudha Publications, 1998.

WEB SOURCES

1. <https://www.skillsyouneed.com/ips/communication-skills.html>
2. <https://www.businessnewsdaily.com/5836-top-interviewing-skills.html>
3. <https://gdpi.hitbullseye.com/Group-Discussion.php>

- B) Health Awareness
- C) First-aid
- D) Career Guidance

Total No of Hours : 30

COURSE OUTCOME

On Completion of this course , students can able to,

CO1:Develop **documentation skill** and reporting of a event.

CO2:Analyze the cost and planning and reports.

CO3: Analyze **socio – Economic skill** Problems

CO4:Explain the role of disaster management in modern life

CO5:List the of various **environment skill issues**

TEXT BOOKS

1. ChhatrapatiShahu – The Pillar of Social Democracy,Ed.P.B.Salunkhe
2. National Service Scheme Manual, Govt.of India

REFERENCE BOOKS

1. Social service opportunities in Hospitals, KapilK.Krishan, TISS
2. History of Social Reforms in Maharashtra, Ed.J.Y.Bhosale, S.U.Kolhapur

WEB SOURCES

- 1.<http://www.igntu.ac.in/Download/aboutNSS.pdf>
- 2.<https://www.slideshare.net/SiniAlby/nss-57278390>

SEC ETHICS AND VALUES 2 0 0 2

COURSE OBJECTIVE: Skill Development

- To increase human ethical sensitivity.
- To increase ethical knowledge.
- To improve ethical judgment.

UNIT-I INTRODUCTION 6

Why Value Education – Ethical Reflections – What is Ethics? Swami Vivekananda

UNIT: II APPROACH TO LIFE
6

Approach to Life - Happiness as Goal - Historical Perspective – Life in the Past Economic Awareness – Economic

UNIT: III KINDS OF VALUES 6

Kinds of Values S.Ignacimuthu S.J – Living Excellence Anthony Robbins – Concern for Influence of Science and Technology in Human’s Social Life Social Relevance of Science and Technology Features – Status of Women – Mass Media and Values.

UNIT IV GOALS AND HUMAN RIGHTS 6

Use Goals to help you grow David J.Schwartz – essential Characteristics of Human Rights.

UNITV INFLUENCE OF SCIENCE AND TECHNOLOGY 6

Social Relevance of Science and Technology – Economic Awareness – Economic Features – Status of Women – Mass Media and Values.

Total No of Hours :

30

COURSE OUTCOME

At the end of the course students can,

CO1: Can able to develop the ethical value defined by swami Vivekananda.

CO2: Able to analyze the obstacles in life and to reach the goal.

CO3: Able to understand the status of women in this society

CO4: Able to understand the influence of science & technology in Human Life.

CO5: Able to understand the economic drive.

TEXT BOOKS

1.Touchstone: Synergy of Values – University of Madras.

2.In harmony- Value Education at College Level- Dept. of Ethics and Religious Studies
Loyolla College, Madras.

WEBSOURCES

1.https://vit.ac.in/files/Ethics_Manual.pdf

2.<https://soaneemrana.org/onewebmedia/Professional%20Ethics%20and%20Human%20Values%20by%20R.S%20NAAGARAZAN.pdf>

3. <https://eng.rizvi.edu.in/wp-content/uploads/2020/04/Handbook-Human-Values-and-Professional-Ethics.pdf>

COURSE OBJECTIVE:

(Employability)

- To help students understand how ethical hacking is used as a method to prevent hacking.
- To make it possible for students to learn the process of identifying vulnerabilities and exploits of the technological ecosystem comprising of various hardware, software, network, OS and applications and identify suitable countermeasures.
- To facilitate students, appreciate the need for understanding non-technology aspects of ethical hacking such as legal frameworks, documentation and report writing.

UNIT I INTRODUCTION TO ETHICAL HACKING 6

Hacking Methodology, Process of Malicious Hacking, and Foot printing and scanning: Foot printing, scanning. Enumeration: Enumeration.

UNIT II TYPES OF HACKING 6

System Hacking and Trojans: System Hacking, Trojans and Black Box Vs. White Box Techniques.

UNIT III HACKING METHODOLOGY 6

Denial of Service, Sniffers, Session Hijacking and Hacking Web Servers: Session Hijacking, Hacking Web Servers.

UNIT IV WEB APPLICATION 6

Web Application Vulnerabilities and Web Techniques Based Password Cracking: Web Application Vulnerabilities, Web Based Password Cracking Techniques.

UNIT III WEB AND NETWORK HACKING 6

SQL Injection, Hacking Wireless Networking, Viruses, Worms and Physical Security:

Viruses and Worms, Physical Security. Linux Hacking: Linux Hacking. Evading IDS and Firewalls: Evading IDS and Firewalls.

**Total No of Hours:
30**

COURSE OUTCOME

On Completion of this course, students can able to

- CO1: Justify the need for meticulous documentation in writing reports for consumption of both technical and management audiences
- CO2: Differentiate the processes of vulnerability assessment and ethical hacking from penetration testing.
- CO3: Comprehend the importance of appropriate countermeasures for managing vulnerabilities.
- CO4: Explain the importance of ethical hacking in achieving the goals of information security.
- CO5: Articulate the rationale for having an adequate legal framework for dealing with hacking and ethical hacking.

TEXT BOOKS

1. Gray Hat Hacking The Ethical Hackers Handbook, 3rd Edition Paperback – 1 Jul 2017 by Allen Harper, Shon Harris, Jonathan Ness, Chris Eagle, McGraw Hill Education; 3 ed (1 July 2017)
2. CEH v9: Certified Ethical Hacker Version 9 Study Guide by Sean-Philip Oriyano, Sybex; Stg edition (17 June 2016)
3. Hacking for Beginners: Ultimate 7 Hour Hacking Course for Beginners. Learn Wireless Hacking, Basic Security, Penetration Testing by Anthony Reynolds, CreateSpace Independent Publishing Platform (10 April 2017)
4. An Ethical Guide To WI-FI Hacking and Security by Swaroop Yermalkar, BecomeShakespeare.com; First edition (15 August 2014)
5. Hands-On Ethical Hacking and Network Defense by Michael T. Simpson | Kent Backman | James Corley, Cengage India 1st edition (2016)

REFERENCE BOOKS

1. The Basics of Hacking and Penetration Testing: Ethical Hacking and Penetration Testing Made Easy by Patrick Egebreton, Syngress; 2 edition (12 September 2013)
2. Hacking With Python: The Complete Guide to Ethical Hacking, Basic Security, Botnet Attack, Python hacking and Penetration Testing Kindle Edition by John C. Smalls

WEBSITES

1. www.javatpoint.com

2. www.tutorialspoint.com

WEB SOURCES

1. <https://www.javatpoint.com/ethical-hacking-tutorial>

2. https://www.tutorialspoint.com/ethical_hacking/index.htm

COURSE OBJECTIVE:**(Employability)**

To make the students to be familiar in Matlab tool containing so many toolbox such as data mining , image processing , signal processing and so on.

UNIT –I Introduction to MATLAB	Brief Introduction
	Installation of MATLAB
	History
	Use of MATLAB
	Key features
MATLAB software	Introduction to MATLAB Software
	MATLAB window
	Command window
	Workspace
	Command history
	Setting directory
	Working with the MATLAB user interface
	Basic commands
	Assigning variables
	Operations with variables
Data files and Data types	Character and string
	Arrays and vectors
	Column vectors
	Row vectors
UNIT – II Basic Mathematics	BODMAS Rules
	Arithmetic operations
	Operators and special characters
	Mathematical and logical operators
	Solving arithmetic equations
Operations on matrix	Crating rows and columns Matrix
	Matrix operations
	Finding transpose, determinant and inverse
	Solving matrix
UNIT – III M-Files	Writing Script file
	Executing script files
	The MATLAB Editor
	Saving m files
Plots	Plotting vector and matrix data
	Plot labelling, curve labelling and editing
GUI Design	Introduction Of Graphical User Interface
	GUI Function Property
	GUI Component Design
	GUI Container

	Writing the code of GUI Callback
	Dialog Box
	Menu Designing
	Applications
UNIT IV	Automating commands with scripts
MATLAB Programming	Writing programs with logic and flow control
	Writing functions
	Control statement Programming
	Conditional Statement Programming
	Examples
Loops and Conditional Statements	Control Flow Conditional Control – if, else, switch
	Loop Control – for, while, continue, break
	Program Termination – return
UNIT – V	Importing and Visualizing Images
Image Processing with MATLAB	Importing and displaying images
	Converting between image types
	Exporting images
	Interactive Exploration of Images
	Obtaining pixel intensity values
	Extracting a region of interest
	Computing pixel statistics
	Measuring object sizes
	Creating a custom interactive tool
	Preprocessing Images
	Adjusting image contrast
	Reducing noise in an image
	Using sliding neighborhood operations
	Using block processing operations

**Total No of Hours :
30**

COURSE OUTCOME:

On Completion of this course, Students can able to

CO1:Develop simple .M files in Matlab

CO2: Analyze various toolboxes available in Matlab.

CO3:Apply mathematical Functions, arrays .matrices in specified applications..

CO4:Interpret plots and export this for use in reports and presentations.

CO5:Execute and manipulate images using image processing toolbox..

TEXT BOOKS

Introduction to Programming in MATLAB – **Sam H.Davis**

Introduction to MATLAB – **Ela Pekalska**

WEBSITES

1. www.tutorialspoint.com

WEBSOURCES

1. <https://www.tutorialspoint.com/matlab/index.htm>

2. <https://www.slideshare.net/ashishmeet/introduction-to-matlab-18425069>

VI SEM SEC V ENTREPRENEURSHIP DEVELOPMENT 2 0 0 2

COURSE OBJECTIVE: **Entrepreneurship**

- To develop and strengthen entrepreneurial quality and motivation in students
- To impart basic entrepreneurial skills and understanding to run a business efficiently and effectively.
- To understand the concept and process of entrepreneurship and its contribution in and role in the growth and development of individual and the nation.

UNIT I ENTREPRENEURSHIP

6

Entrepreneur – Personality characteristics of successful entrepreneur– Types of Entrepreneurs – Knowledge and skills required for an entrepreneur –Difference between Entrepreneur and Intrapreneur

UNIT II BUSINESS

6

Definition, Classification – Characteristics, Ownership Structures – Project Formulation – Steps involved in setting up a Business –Market Survey and Research–Techno Economic Feasibility Assessment

UNIT III BUSINESS PLAN PREPARATION

6

Sources of product for business – Pre-feasibility study – Criteria for selection of product– Ownership – Capital – Budgeting project profile preparation – Matching entrepreneurwith the project – Feasibility report preparation and evaluation criteria.

UNIT IV SUPPORT TO ENTREPRENEURS

6

Sickness in small Business – Concept, Magnitude, Causes and Consequences, Corrective Measures – Business Incubators – Government Policy for Small Scale Enterprises – Growth Strategies in small industry.

UNIT V ENTREPRENEURSHIP DEVELOPMENT PROGRAMME

6

Meaning, Objectives–Phases of EDP– steps in EDP–Strategies for Entrepreneurship development– Institutions in aid of Entrepreneurship Development Programme–Use of IT enabled services in entrepreneurship - E Licensing, E filing.

Total No of Hours: 30

hrs

COURSE OUTCOMES:

At the end of the course, a student will be able to

CO1: Understand the concept of Entrepreneurship

CO2: Identify, create and analyze entrepreneurial opportunities.

CO3: Assess techno economic feasibility of a Business Plan

CO4: Create Business Plans

CO5: State various statutory institutions involved in the process of Entrepreneurship development

TEXT BOOKS:

1. Hisrich R D, Peters M P, "Entrepreneurship" 8th Edition, Tata McGraw-Hill, 2016
2. Khanka S.S., "Entrepreneurial Development" S Chand & Company; edition, 2016

REFERENCE BOOKS:

1. Sharma, "Entrepreneurship Development", PHI LEARNING PVT LTD, (2017)
2. Abhinav Ganpule&Aditya Dhobale, "Entrepreneurship Development", Kindle Edition, Jatayu Publication; 1 edition ,2018.
3. Sangeeta Sharma, "Entrepreneurship Development", 10th Edition, Kindle EditionPHI Learning, 2018

WEBSITES

1. <http://www.simplynotes.in/e-notes/mbabba/entrepreneurship-development/>
2. <https://openpress.usask.ca/entrepreneurshipandinnovationtoolkit/chapter/chapter-1-introduction-to-entrepreneurship/>

WEBSOURCES

1. <https://articles.bplans.com/10-great-websites-for-entrepreneurs/>
2. <https://www.entrepreneur.com/article/272185>

**GENERIC
ELECTIVES
(GE)**

COURSE OBJECTIVE:**(Employability)**

- To make the student understands the overall view of internet.
- To inculcate the students about the various facilities available in internet.
- To gain practical knowledge about internet.

UNIT I INTRODUCTION**9**

Internet and its history, defining and describing the Internet, Brief history, discussing the future of the Internet, Internet Resources. Describe the important features of the Web and Web browser software, Evaluate e-mail software and Web-based e-mail services

UNIT II EMAIL**9**

Email , Parts of email ,Email software , Web based email , Email address , List servers , Newsgroups ,Newsgroups names , Newsgroups readers ,Chat rooms , Conferencing

UNIT III INTERNET RESOURCES**9**

Internet Resources, Games, File transfer protocol, Telnet, World Wide Web, Behavior on the Internet , Accessing the Internet , Types of access , Online services , Internet services providers , How and where to look for the service Browsing the Web , Browsing the Web.

UNIT IV FTP**9**

Use FTP and other services to transfer and store data, Demonstrate the use of real-time chat and briefly describe the history of the wireless Internet. Use mailing lists, newsgroups, and newsfeeds, Create HTML documents and enhance them with browser extensions

UNIT V APPLICATIONS

9

Applications of Internet- education, business, government, Communication , Job searches, Health and medicine, Travel, Entertainment, Shopping, Stock market updates, Research.

Total No of Hours:

45

COURSE OUTCOME

At the end of the course students can able to,

CO1: Develop & design mail to his/her friends

CO2: Analyze the search engine (ie) browsers.

CO3: Use the applications of internet

CO4: Understand the basic concepts and features of Web.

CO5: Understand the security threats and electronic commerce.

TEXT BOOK

1. Rohit Khurana , “COMPUTER FUNDAMENTALS and INTERNET BASICS”,
Aph Publishing Corporation,2010.

REFERENCE BOOK

1. Margaret Levine Young, “Internet Millenium Edition “,Osborne Publications,2000.

WEBSITES

1. www.w3schools.com
2. www.tutorialspoint.com
3. www.javapoint.com

WEBSOURCES

1. <https://www.oswaalbooks.com/download/freeresources/class10/175Quick%20Revision%20Notes%2010th%20Computer%20Application.pdf>
2. <https://fcit.usf.edu/internet/chap1/chap1.htm>
3. <https://www.slideshare.net/osuchin/internet-basics-13440260>
4. <https://www.slideshare.net/argusacademy/internet-40994977>

COURSE OBJECTIVE:**(Employability)**

- To explain the student the major concepts of web designing.
- This course explains the graphics and animation..
- This course Introduce basics concept of CSS.

UNIT I WEB DESIGN PRINCIPLES**9**

Basic principles involved in developing a web site , Planning process , Five Golden rules of web designing , Designing navigation bar , Page design , Home Page Layout , Design Concept.

UNIT II BASICS IN WEB DESIGN**9**

Brief History of Internet , What is World Wide Web , Why create a web site , Web Standards , Audience requirement.

UNIT III INTRODUCTION TO HTML**9**

What is HTML , HTML Documents , Basic structure of an HTML document ,Creating an HTML document , Mark up Tags , Heading-Paragraphs ,Line Breaks , HTML Tags,Elements of HTML , Introduction to elements of HTML , Working with Text , Working with Lists, Tables and Frames ,Working with Hyperlinks, Images and Multi media .Working with Forms and controls.

UNIT IV INTRODUCTION TO CASCADING STYLE SHEETS 9

Concept of CSS , Creating Style Sheet , CSS Properties , CSS Styling(Background, Text Format, Controlling Fonts) , Working with block elements and objects , Working with Lists and Tables , CSS Id and Class , Box Model(Introduction, Border properties, Padding

, Properties, Margin properties) .

UNIT V INTRODUCTION TO WEB PUBLISHING OR HOSTING

9

Creating the Web Site, Saving the site, working on the web site, Creating web site structure, Creating Titles for web pages, Themes-Publishing web sites.

Total No of Hours:

45

COURSE OUTCOME

At the end of the course students can able to

CO1: Design static Websites using HTML.

CO2: Create websites using CSS.

CO3: Apply CSS properties & able to embed the style sheet into HTML documents

CO4: Demonstrate web hosting.

CO5: Understand basic tags and CSS Properties

TEXT BOOK

1. Ivan Bayross , “HTML 5 and CSS 3 Made Simple”,BPB publications,Dec 2012.

REFERENCE BOOK

1. Thomas A Powell,”HTML Complete Reference “,McGraw Publications,2000

WEBSITES

1. www.w3schools.com
2. www.tutorialspoint.com
3. www.javapoint.com

WEBSOURCES

- 1.https://www.tutorialspoint.com/html/html_tutorial.pdf
- 2.<https://wtf.tw/ref/duckett.pdf>
- 3.<https://www.shahucollegelatur.org.in/Department/Studymaterial/bvoc/Web%20Hosting.pdf>

VI SEM GEMY SQL

3 0 0 3

COURSE OBJECTIVE:

(Employability)

- To make the student understands how the SQL works in computer.
- To practice the student about creation, deletion, insertion, appending of database in SQL.
- To make the student to create a report of the database created.

UNIT I THEORY, TERMINOLOGY AND CONCEPTS

9

Client/Server Concepts, Database and Database Objects, Data Definition using SQL , Databases , Data Types, Tables ,Constraints and Indexes ,Views.

UNIT II BASIC DATA MANIPULATION USING SQL

9

Recurring SQL Constructs , Adding data , Modifying data, Removing data, Searching data ,Advanced Data Manipulation using SQL , Expressions , Grouping and Aggregate Functions , Joining Tables.

UNIT III THEORY, TERMINOLOGY AND CONCEPTS

9

Client/Server Concepts, Database and Database Objects , Transactions , Transaction Concepts , SQL for working with Transaction ,Import/Export,Tools for Import/Export ,SQL for Import/Export.

UNIT IV FILES SYSTEMS AND DATABASES

9

The Relational Database Model, Structured Query Language (SQL), Entity Relationship Modeling (ERD) , Normalization of Database Tables , Database Design.

UNIT V SQL QUERIES

9

SQL Queries- Basic SQL Queries & Modification Commands , SQL functions,SQL JOIN, Table Creation and Normalization , DDL functions , Database Project

Total No of Hours:

45

COURSE OUTCOME

At the end of the course students can able to

CO1: Create SQL Queries using DDL , DML & DCL commands

CO2: Understand the basic terminology & concepts of database.

CO3: Understand the entity-relationship model..

CO5: Understand SQL join & normalization.

CO4: Explain the client /server concept.

TEXT BOOK

1. Paul DuBois, “MySQL Developer's Library,5th Edition,2013.

REFERENCE BOOK

1. Michael Kruckenberg, “Pro MYSQL”, Apress Publications,2005.

WEBSITES

1. www.w3schools.com
2. www.tutorialspoint.com
3. www.javapoint.com

WEBSOURCES

- 1.https://www.tutorialspoint.com/mysql/mysql_tutorial.pdf
- 2.<https://downloads.mysql.com/docs/mysql-tutorial-excerpt-5.7-en.pdf>
- 3.<https://www.slideshare.net/webhostingguy/mysqlppt-3672569>

4. <https://slideplayer.com/slide/13209422/>

**ABILITY
ENHANCEMENT
COMPULSORY
COURSE(AECC)**

COURSE OBJECTIVE: Skill Development

- This course is to subject the students to practise the components in various units. To make students ready for placement interviews within campus.
- To infuse confidence to face job situations.

Credit Hours**UNIT I****06**

- Resume and CV Writing
- Complaint Letter
- Social Correspondence
- Letter of Enquiry

UNIT II**06**

- Short Essay Writing

UNIT III**06**

- Explaining Proverbs

UNIT IV**06**

- Use of Prepositions

UNIT V**06**

- Synonymous Words

Total No of Hours: 30 Hours**COURSE OUTCOME:****On Completion of this Course, students can able****CO1:** To enhance learners' confidence level.**CO2:** To make learners' feel the assimilation of skills.**CO3:** To engage in a conversation with others to exchange ideas.**CO4:** To impart leadership qualities among the participants.**CO5:** To express opinions to enhance their social skills.

TEXT BOOKS

- For Unit I – V Effective Communication For You – V. Syamala Emerald Publishers, Chennai.
- Cameron, David. Mastering Modern English, Hyderabad: Orient Blackswan, 1978 (rpt. 1989, 1993, 1995,1998).
- Freeman, Sarah. Written Communication in English, Hyderabad: Orient Blackswan, 1977 (21st Impression,2007).
- Singh, Vandana R. The Written Word. New Delhi: Oxford university Press, 2003 (3rd Impression, 2007)
- Seely, John. Oxford Guide to Effective Writing and Speaking. New Delhi: Oxford University Press, 2000 (4thImpression,2008)

Web Sources:

- <https://www.myperfectresume.com/career-center/resumes/how-to/write>
- <https://www.englishgrammar.org/>

COURSE OBJECTIVE **Employability**

To inculcate the importance of environmental pollution, preservation of nature and environmental management for human welfare.

UNIT-I MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES, NATURAL RESOURCES

06

Definition, scope and importance, need for public awareness.

Renewable and non-renewable resources - Natural resources and associated problems. a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people. b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. e) Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. Case studies. f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification - Role of an individual in conservation of natural resources- Equitable use of resources for sustainable lifestyles.

UNIT-II ECOSYSTEMS, BIODIVERSITY AND ITS CONSERVATION

06

06

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

biodiversity.

UNIT-III ENVIRONMENTAL SCIENCE 06

Definition, Cause, effects and control measures of a) Air pollution b) Water pollution c) Soil pollution d) Marine pollution e) Noise pollution f) Thermal pollution g) Nuclear hazards. Solid waste Management. Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution. Pollution case studies. Disaster management- floods, earthquake, cyclone and landslides.

UNIT-IVSOCIAL ISSUES AND THE ENVIRONMENT06

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

UNIT-V HUMAN POPULATION AND THE ENVIRONMENT 06

Population growth, variation among nations. Population explosion – Family Welfare Programme. Environment and human health. Human Rights. Value Education. HIV/AIDS. Women and Child Welfare. Role of Information Technology in Environment and human health. Case Studies. Field work - Visit to a local area to document environmental assetsriver/forest/grassland/hill/mountain, Visit to a local polluted site-Urban/Rural/Industrial/Agricultural, Study of common plants, insects, birds, Study of simple ecosystems-pond, river, hill slopes, etc.

Total No of Hours: 30 hrs

COURSE OUTCOME

CO1:To understand the nature and facts about environment.

CO2:To find and implement scientific, technological, economic solutions to environmental problems.

CO3:To know about the interrelationship between living organisms and environment.

CO4: To understand the integrated themes and biodiversity, natural resources, pollution control and waste management.

CO5: To appreciate the importance of environment by assessing its impact on the human world.

TEXT BOOKS

1. De AK, Environmental Chemistry, Wiley Eastern Ltd.
2. Bharucha Erach, 2003. The Biodiversity of India, Mapin Publishing Pvt. Ltd, India.
3. Brunner RC, 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480pgs.
4. Clark RS, Marine Pollution, Clanderson Press, Oxofrd (TB).

REFERENCE BOOKS

1. Agarwal KC, 2001. Environmental Biology, Nidi Publishers Ltd. Bikaner.
2. Gleick HP, 1993. Water in Crisis, Pacific Institute for Studies in Development, Environment and Security. Stockholm Environmental Institute, Oxford University Press, 473pgs.
3. Heywood VH, and Watson RT, 1995. global Biodiversity Assessment. Cambridge University Press 1140pgs.
4. Jadhav H and Bhosale VM, 1995. Environmental Protection and Laws. Himalaya Publishing House, Delhi 284pgs.
5. Miller TG, Jr. Environmental Science, Wadsworth Publishing CO. (TB)