ABOUT THE INSTITUTION

The Kovai Kalaimagal Educational Trust established in the year 1992 with an aspiration to quench the educational thirst of the poor and the needy strata of the society particularly from rural area. It sprouted with the establishment of a school and soon extended to add Kovai Kalaimagal College of Arts and Science in the year 1996 – 1997, Coimbatore Institute of Management and Technology in 1996 – 1997, Coimbatore Institute of Engineering and Technology in 2001 – 2002 and CIET School of Architecture in 2013 – 2014. The trust is managed by the dedicated team of trustees Dr. T. Banumathi, Dr. T. Namradha, Dr. K. A. Chinnaraju, Tmt. P. Shanmugadevi, Thiru. S. Subramanian and Thiru. M. Thangavelu who fully devote their time for the development of the institutions under the trust and it is due to their tireless efforts, the colleges have carved a name for themselves in the academic circle.

The college is situated in a serene atmosphere surrounded by picturesque mountains offering a very conducive environment for the academic perseverance. It is an ISO 9001:2008 certified institution and it has also been accredited by NAAC with 'A' grade. Committed to make quality education affordable especially to economically weaker sections particularly from rural area and strengthen the areas of research, enhance the process of sensitizing the students to personal values, spiritual growth and social responsibility. The college has taken every effort to ensure sustenance and enhancement of the quality in education.

Promoting Body

The Kovai Kalaimagal Educational Trust (KKET) was started in 1992 to establish educational institutions with the motto: 'Light the Light within'. The trust has, so far, established Kovai Kalaimagal College of Arts and Science, Coimbatore Institute of Engineering and Technology, CIET School of Architecture and Coimbatore Institute of Management And Technology at Vellimalaipattinam, Narasipuram Post, Thondamuthur Via, Coimbatore - 641 109.

Environment

KKCAS is located at Vellimalaipattinam, near Narasipuram, sprawling over a land area of 10.58 acres, surrounded by green hillocks. The campus has a serene and studious atmosphere with least disturbance and distraction. The students find the environment to be very conducive for their studies. Facilities in the campus meet their needs for extra / co-curricular activities.

ISO 9001:2008

As our institution is an ISO 9001:2008 certified institution, we have a strong system which takes care of the planned activities for enhancing quality in every respect. The institution implemented the Quality Management System and registered for the ISO certification since 2002. After implementation of the Quality Management System, not a single non-conformance was noticed in any of the QMS audit.

NAAC

Our institution was accredited with "A" grade by NAAC in the year 2011 and again Re-accredited with "A" grade by NAAC from September 2016.

Centre for Research

There is a research committee constituted in KKCAS which takes care of the promotion of research activities. Majority of members of faculty of Computer Science are the research guides guiding the scholars who pursue MPhil programme. This committee motivates the eligible faculty to apply for more number of research projects sponsored by UGC in topics of current interest.

The committee reviews the progress made by the research scholars periodically and advises them accordingly. In case the progress is not satisfactory, the reason for the same is found out and a solution to progress further is provided.

The committee recommends the research scholars and faculty pursuing Ph.D to participate and present papers in seminars and conferences and also publish research articles in reputed national and international journals. Those who are yet to register for pursuing M.Phil or Ph.D programmes are advised to register immediately and necessary support is also provided for finding suitable guides. The committee also recommends cash awards to those who publish research articles in refereed journals and sanction of additional increments and promotions to those who complete the Ph.D degrees. This has created a good impact as is evidenced by the number of faculty coming forward to pursue Ph.D programme.

Placement Cell

The institution has a placement cell which is effectively functioning under a placement officer and a placement coordinator. The responsibility of the placement officer is to identify the skills that are required to be possessed by the students as per the requirements of the companies and arrange for training programs for developing such skills among the students. Thus a number of training programs are organized to develop the communication skills, mathematical and English aptitude, group discussion and technical skills by the professors and professional trainers.

It also arranges career-counselling programmes through psychometric tests. These tests bring out the students strengths, weaknesses and their personal interests and attitude towards various career options available to them. If needed, it arranges for any follow-up programmes to overcome the weaknesses. Regular seminars are organized to enhance their capability for grabbing various career options.As a results nearly 75% of students are able to get placements from reputed companies.

Hostel

Separate and comfortable accommodation for boys and girls is provided within the college campus to accommodate 650 boys and 750 girls. Facilities for playing indoor games and common reading rooms with audio visual equipments are available in all the hostels.

The institution plans for providing residential accommodation to the staff and there is a proposal for the construction of staff quarters. As there is a separate RO plant, purified and safe drinking water is provided to all the students.

Recognitions

The college has been recognized for the welfare schemes implemented for the benefit of the students and has been rewarded with "Best College Award" during 2007 – 2008 by the Bharathiar University. It has also been awarded with "Third Best College Award" for overall performances during the year 2008-2009 based on ten different criteria such as Results of University Examinations, Conducting Seminars, Workshops, Symposia and State and National Level Conferences, Self Development Programmes for Students, Number of Placements made in the Campus Interviews, Student Supporting Services, Faculty Development Programmes, Publication of Books and Research articles in Journals and Magazines, Research Activities, Social Service through NSS, YRC and RRC and achievements in Sports and Games. The institute was awarded with "A" Grade by National Assessment and Accreditation Council (NAAC). The college was granted Autonomous status by UGC, New Delhi for six years with effect from 2016-2017.

KOVAI KALAIMAGAL COLLEGE OF ARTS AND SCIENCE

(An Autonomous Institute Affiliated to Bharathiar University)

Re - accredited with "A" grade by NAAC

Regulations for Undergraduate Programmes

(Under Choice Based Credit System)

(Effective from 2016 – 2017)

1. REGULATIONS

This regulation is effective from the academic year 2016 -2017.

1.1. Eligibility for Admission

Course	Eligibility Condition
B C A	A pass in higher secondary course. Preference will be given to those who have studied Mathematics as one of the subjects.

1.2. Duration and Course of Study

Three Academic years with six semesters, the duration of the first, third and fifth Semesters from June to November and the second, fourth and sixth Semesters from December to April. The duration of each semester is 90 working days.

1.3. The Medium of Instruction and Examinations

The medium of instruction and examinations shall be English.

1.4. Requirements for Attendance

a) A candidate will be permitted to take the examination for any semester, if he/she secures not less than 75% of attendance out of the 90 working days during the semester.

b) A candidate who has secured attendance less than 75% but 65% and above shall apply with the prescribed fee for the condonation of lack of attendance. On the recommendation of the Principal, he/she will be permitted to take up the examination.

c) A candidate who has secured attendance less than 65% but 55% and above in any semester, will be permitted to continue the course but will not be permitted to appear for the examination in the current papers. However he/she will be permitted to appear for the examination in the papers in which he/she has arrears. He/she will have to compensate the shortage of attendance in the subsequent semester and take the examination in the papers of both the semester together .

d) A candidate who has secured less than 55% of attendance in any semester will not be permitted to take the regular examinations and to continue the study in the subsequent

semester. He/she has to re-do the course by rejoining in the semester in which the attendance is less than 55%.

e)   A candidate who has secured less than 65% of attendance in the final semester has to compensate his / her attendance shortage in a manner to be decided by the Head of the Department concerned after rejoining the course.

1.5   Restriction to take the Examinations

a. Any candidate having arrear paper(s) shall have the option to take the examinations in any arrear paper(s) along with the subsequent regular semester papers.

b. Candidates who fail in any of the papers shall pass the paper(s) concerned   within five years from the date of admission to the said course. If they fail to do so, they shall take the examination in the revised text / syllabus, if any, prescribed for the immediate next batch of candidates. If there is no change in the text / syllabus they shall take the examination in that paper with the syllabus in vogue, until there is a change in the text or syllabus.

In the event of removal of that paper consequent to the change of regulations and / or curriculum after a five year period, the candidates shall have to take up an equivalent paper in the revised syllabus as suggested by the chairman and fulfill the requirements as per regulations/curriculum for the award of the degree.

1.6   The Evaluation System

The major objective of the institution's evaluation system is to motivate all students to excel in their performance. The students' performance is continually assessed through Continuous Assessment (CIA) and End Assessment (EAE). The CIA, EAE break up for theory papers is 25:75 and practical is 40:60.

1.6.1.   Break Up of Continuous Internal Assessment (CIA) Marks

Theory (Languages, English, Core, Allied and Elective)

Content	Marks Awarded
Internal Assessment Test	05
Online Test	05
Model Examination	10
Assignment (2 Numbers)	05

Total	**25**

Theory (Communication Skills, Mathematics for Competitive Examinations and Aptitude & Soft Skills)#

Content	Marks Awarded
Internal Assessment Test I	25*
Internal Assessment Test II	
Internal Assessment Test III	25
Total	**50**

* Test I and Test II will be evaluated for 25 marks each and the average of these two will be considered.

Internal Evaluation only

Practical

Content	Marks Awarded (Max Marks: 100)	Marks Awarded (Max Marks: 50)
Minimum ten Experiments / Practical Paper / Semester	20	05
Internal Assessment Test	05	05
Model Exam	10	05
Record Note Book	05	05
Total	**40**	**20**

Project Viva Voce

Content	Marks Awarded
Review and Content Presentation (3 Reviews) (3*20)	60
Record	20
Total	**80**

1.6.2. End Assessment Examinations (EAE)

a) Semester examination will be conducted at the end of each semester after completing a minimum of 90 working days.

b) End Assessment Examination for the odd semester will generally be held during November and even semester during April.

c) The question papers for all the courses will be set by the external examiners.

d) The examinations for Language, English, Core Allied and Elective will be conducted for a maximum of 75 marks for three hours. The passing minimum is 40% (30 out of 75 marks) and overall passing minimum putting the CIA and EAE marks together will be 40%.

e) Question Paper Pattern: (**Languages, English, Core, Allied and Elective**)

Part A	10 Marks	10 Questions - 1 Mark each – Objective type
Part B	25 Marks	5 Questions- 5 Marks each – either or type.
Part C	40 Marks	5 Questions- 8 Marks each – either or type.
Total	**75 Marks**	

f. The exams for value Based Eduction & Non Maor Elective will be conducted for a maximum of 50 marks for three hours. The passing minimum is 40% (20 out of 50 marks).

g. Question Paper Pattern: (**Value Based Education & Non Major Elective**)

Part A	50 Marks	1. Questions - either or type of question - 10 Marks each

h. Question paper pattern : (**Extra Credit Courses**)

Part A	40 Marks	5 Questions- 8 Marks each – either or type.
Part B	60 Marks	5 Questions- 12 Marks each – either or type.
Total	**100 Marks**	

i. The marks secured in the extra credit course will get reflected in the mark sheet only if the candidate has secured 40% marks and above.

j. The students will be allowed to choose only two papers per semester under the extra credit courses from third semester onwards.

k. **Practical**

Content	Marks Awarded (Max Marks: 100)	Marks Awarded (Max Marks: 50)
Program - 1	20	10
Program - 2	20	10
Viva voce	10	05
Record	10	05
Total	**60**	**30**

l. **Project Viva Voca**

> The evaluation for the end semester examination should be as per the norms given below:

Content	Marks Awarded
Viva Voce	20
Total	**20**

m. The students who have opted for the languages other than Tamil in part-I should undergo basic Tamil Course during the 2nd year of the study as a non-credit course for which there would be only Internal Evaluation .

n. For all the non-credit couses result would be indicated as "Pass" or "Re-Appearance" and not by marks or grades secured in the grade sheet.

o. There will be one independent valuation for all theory papers under parts I, II & III by external examiner.

p. A candidate may request for re-totalling/revaluation of his/her answer script by submitting an application addressing to the Controller of Examination through the Principal, paying the prescribed fee. This provision is available for all theory papers taken in the EAE. However there is no provision for revaluation of Practical papers.

q. Candidates desirous of improving the marks awarded in a passed subject in their first attempt shall reappear once within a period of subsequent two semesters. The improved marks shall be considered for classification but not for ranking. When there is no improvement, there shall not be any change in the original marks already awarded.

r. Supplementary examination will be conducted for the benefit of final year students after 15 days of the declaration of the final semester results. Candidate who has arrears in any semester subject to a maximum of three papers can appear for the supplementary exam conducted after the final semester.

1.7   Grading

The following table gives the marks, grade points, letter grades and classification to indicate the performance of the candidate.

Conversion of Marks to Grade Points and Letter Grades (Performance in a Course/Paper)

Range of Marks	Grade Points	Letter Grade	Description
90-100	9.0-10.0	O	Outstanding
80-89	8.0-8.9	D+	Excellent
75-79	7.5-7.9	D	Distinction
70-74	7.0-7.4	A+	Very Good
60-69	6.0-6.9	A	Good
50-59	5.0-5.9	B	Above Average
40-49	4.0-4.9	C	Average
00-39	0.0	U	Re - Appearance
ABSENT	0.0	AB	Absent

C_i = Credits earned for course i in any semester

G_i = Grade Point obtained for course i in any semester

n = refers to the semester in which such course were credited

For a Semester:

GRADE POINT AVERAGE [GPA] = $\sum_i C_i G_i / \sum_i C_i$

$$GPA = \frac{\text{Sum of the multiplication of grade points by the credits of the courses}}{\text{Sum of the credits of the courses in a semester}}$$

For the Entire Programme:

CUMULATIVE GRADE POINT AVERAGE [CGPA] = $\sum_n \sum_i C_{ni} G_{ni} / \sum_n \sum_i C_{ni}$

$$CGPA = \frac{\text{Sum of the multiplication of grade points by the credits of the entire programme}}{\text{Sum of the credits of the courses of the entire programme}}$$

CGPA	Grade	Classification of Final Result
9.5 and above up to 10.0	O+	First Class – Exemplary*
9.0 and above but below 9.5	O	
8.5 and above but below 9.0	D++	First Class with Distinction*
8.0 and above but below 8.5	D+	
7.5 and above but below 8.0	D	
7.0 and above but below 7.5	A++	First Class
6.5 and above but below 7.0	A+	
6.0 and above but below 6.5	A	
5.5 and above but below 6.0	B+	Second Class
5.0 and above but below 5.5	B	
4.5 and above but below 5.0	C+	Third Class
4.0 and above but below 4.5	C	
0.0 and above but below 4.0	U	Re – Appearance

Classification of Successful candidates

A candidate who passes all the examinations in Part I to Part IV securing following CGPA and Grades shall be declared as follows for each part:

CGPA	Grade	Classification of Final Result
9.5 and above up to 10.0	O+	First Class – Exemplary*
9.0 and above but below 9.5	O	
8.5 and above but below 9.0	D++	First Class with Distinction*
8.0 and above but below 8.5	D+	
7.5 and above but below 8.0	D	
7.0 and above but below 7.5	A++	First Class
6.5 and above but below 7.0	A+	
6.0 and above but below 6.5	A	
5.5 and above but below 6.0	B+	Second Class
5.0 and above but below 5.5	B	
4.5 and above but below 5.0	C+	Third Class
4.0 and above but below 4.5	C	
0.0 and above but below 4.0	U	Re-Appearance

* The candidates who have passed in the first appearance and within the prescribed semester of the Programme (Major, Allied and Elective Course alone) are eligible.

1.8 Course Completion

Students shall complete the programme within a period not exceeding three years for UG courses from the date of admission

SCHEME OF EXAMINATION AND PROGRAMME STRUCTURE

Bachelor of Computer Applications (2016 – 2019)

Part	Subject Code	Study Components	Hrs / Week	CIA	Ext	Total	Credits
		Semester – I					
I	16U1TALT01	**Language 1** : Paper I	5	25	75	100	3
II	16U1ENLT01	**Language 2** : English I	5	25	75	100	3
III	16U1CACT01	**Core 1:** C Programming	5	25	75	100	5
	16U1CACT02	**Core 2:** Digital Fundamentals and Architecture	5	25	75	100	5
	16U1CACP03	**Core 3:** C Programming - Practical	3	40	60	100	3
	16U1CAAT01	**Allied 1 :** Numerical Methods and Statistics	5	25	75	100	4
IV	16U1VBET01	**Value Based Education 1 :** Environmental Studies **	2	-	50	50	2
		TOTAL CREDITS					**25**
		Semester – II					
I	16U2TALT02	**Language 1** : Paper II	5	25	75	100	3
II	16U2ENLT02	**Language 2** : English II	5	25	75	100	3
III	16U2CACT04	**Core 4:** C++ Programming	5	25	75	100	5
	16U2CACT05	**Core 5:** Data Structures	4	25	75	100	5
	16U2CACP06	**Core 6:** Data Structures & C++ Programming - Practical	4	40	60	100	3
	16U2CAAT02	**Allied 2 :** Discrete Mathematics	5	25	75	100	4
IV	16U2VBET02	**Value Based Education 2 :** Ethics & Culture **	2	-	50	50	2
		TOTAL CREDITS					**25**
		Semester – III					
III	16U3CACT07	**Core 7:** Operating Systems	5	25	75	100	4
	16U3CACT08	**Core 8:** Java Programming	5	25	75	100	4
	16U3CACT09	**Core 9:** Data Communications and Networks	6	25	75	100	4
	16U3CACP10	**Core 10:** Java Programming -Practical	6	40	60	100	3
	16U3CAAT03	**Allied 3 :** Operations Research	5	25	75	100	4
IV	16U3NMET01	**Non Major Elective 1:** Food Science and Nutrition	2	-	50	50	2
	16U3SBST01	**Skill Based Subject 1 :** Mathematics for Competitive Examinations - I	2	50	-	50	2
	16U3SBST02	**Skill Based Subject 2 :** Communication Skills - I	2	50	-	50	2
	16U3BTLT01	**Non Credit Course :** Basic Tamil – I #	-	-	-	-	-
		Sports	2	-	-	-	-
		Library	1	-	-	-	-
		TOTAL CREDITS					**25**

Part	Subject Code	Study Components	Hrs / Week	CIA	Ext	Total	Credits
			Semester – IV				
III	16U4CACT11	**Core 11:** Web Designing	5	25	75	100	4
	16U4CACT12	**Core 12:** System Analysis and Design	6	25	75	100	4
	16U4CACT13	**Core 13:** E-Commerce	5	25	75	100	3
	16U4CACP14	**Core 14:** Web Designing - Practical	6	40	60	100	3
	16U4CAAT04	**Allied 4:** Business Accounting	5	25	75	100	4
IV	16U4NMET02	**Non Major Elective 2:** Floriculture	2	-	50	50	2
	16U4SBST03	**Skill Based Subject 3:** Mathematics for Competitive Examinations – II	2	50	-	50	2
	16U4SBST04	**Skill Based Subject 4 :** Communication Skills – II	2	50	-	50	2
	16U4BTLT02	**Non Credit Course :** Basic Tamil – II #	-	-	-	-	-
		Sports	2	-	-	-	-
		Library	1	-	-	-	-
						TOTAL CREDITS	**24**
			Semester – V				
III	16U5CACT15	**Core 15:** ASP . Net and C# Programming	5	25	75	100	4
	16U5CACT16	**Core 16:** Relational Database Management Systems	5	25	75	100	4
	16U5CACP17	**Core 17:** ASP . Net and C # Programming Practical	6	40	60	100	4
	16U5CACP18	**Core 18:** Web Technology Practical	6	20	30	50	3
		Elective 1 :	4	25	75	100	3
		Elective 2 :	4	25	75	100	3
	16U5NCCT01	**Non Credit Course :** Aptitude and Soft Skills - I	3	-	-	50	-
		Sports	2	-	-	-	-
		Library	1	-	-	-	-
						TOTAL CREDITS	**21**
			Semester – VI				
III	16U6CACT19	**Core 19:** Software Testing	5	25	75	100	4
	16U6CACP20	**Core 20:** Software Testing - Practical	5	40	60	100	3
	16U6CACP21	**Core 21:** PHP & MySQL -Practical	6	20	30	50	3
	16U6CACV22	**Core 22:** Project and Viva Voce	6	80	20	100	4
		Elective 3 :	4	25	75	100	3
		Elective 4 :	4	25	75	100	3
	16U6NCCT02	**Non Credit Course :** Aptitude and Soft Skills - II	3	-	-	-	-
		Sports	2	-	-	-	-
		Library	1	-	-	-	-
						TOTAL CREDITS	**20**
			Total			**3700**	**140**

**Answers to the questions may also be given in Tamil.

The students who have not studied Tamil in Higher Secondary Course and not opted for Tamil under Language I in the Degree programme have necessarily to study Basic Tamil for 2 hours / week during III & IV Semesters after their regular college working hours

Project and Viva Voce:

Project Work carries 100 marks with 4 credits will be awarded. The breakup of marks will as follows.

Internal Assessment: 80 marks (60 Marks for 3 Reviews and 20 marks for record) and External Assessment: 20 marks (Viva Voce).

List of Electives		
Sub Code		**Subjects**
Elective 1	**16U5CAET1A**	Software Engineering
	16U5CA ET1B	Data Mining
	16U5CA ET1C	Computer Graphics
Elective 2	**16U5CA ET2A**	Embedded Systems
	16U5CA ET2B	Client Server Technology
	16U5CA ET2C	Web Technology and its Applications
Elective 3	**16U6CA ET3A**	Artificial Intelligence and Expert Systems
	16U6CA ET3B	Mobile Computing
	16U6CA ET3C	Distributed Computing
Elective 4	**16U6CA ET4A**	Compiler Design
	16U6CA ET4B	Mobile Operating System
	16U6CA ET4C	PHP and MySQL

Extra Credit Courses		
Sub Code	**Subject**	**Credits**
16UCAECC01	Human Resource Management	2
16UCAECC02	Principles and Practice of Marketing Services	2
16UCAECC03	Investment Management	2
16UCAECC04	Consumer Marketing	2
16UCAECC05	International Marketing	2
16UCAECC06	Production and Operations Management	2
16UCAECC07	Entrepreneurial Development	2
16UCAECC08	Management Information System	2

16UCAECC09	Executive Business Communication	2
16UCAECC10	Brand Management	2
16UCAECC11	Stress Management	2
16UCAECC12	Theory of Computation	2

Curriculum Structure

S.No	Course	No of Papers	Credits
1	Language 1 : Tamil/Hindi/Malayalam/French	2	6
2	Language 2 : English	2	6
3	Core	22	84
4	Allied	4	16
5	Elective	4	12
6	Value Based Education	2	4
7	Skill Based Subject	6	8
8	Non-Major Elective	2	4
	Total		140

SEMESTER - I
LANGUAGE 1: TAMIL I

Subject Code: 16U1TALT01   **Total Hrs: 75**   **No. of Credits: 3**

Kjy; gUtk; (nraAs; rpWfij , , yf;fz k;, , yf;fpa tuyhW)

Nehf;fk;
- r%fk; gwwpa rpej i dfi sj; jkpog; gi l ggpyf;fpaqfs; %yk; VwgLj;Jjy;
- GJf;ftpij fs;, rpWfij fs; Mfpatwi wg; gbf;f i tjjy;/vOj i tjjy;
- Nghlbj; NjuTfSf;F khz tufi sj; jahu; nrajy;

myF – 1 nraAs;jpiL : kuGf; ftpij fs;   **(15 kz pNeuk)**

- ghujpahu;   -   Nahfrpj;jp (ghujpahu; ftpi jfs;)
- ghujpjhrd;   -   jkpDf;F tbrrpapyi y (ghujpjhrd; ftpi jfs;)
- ftpkz p   -   ftpi j (kyUk; khi yAk;)
- fzz jhrd;   -   MjpahNy thuji j , Uejhu; (, NaR fhtpak)

myF – 2 nraAs;jpiL : GJf; ftpi jfs;   **(13 kz pNeuk)**
- GtpauR   -   fjhehafp (xU Kffpa mwptpgG)
- mg;Jy; uFkhd;   -   jtwhd vz ; (Myhgid)
- ituKj;J   -   cd; Mdkffjjpd; muj;jk; (ftpah[d; fi j)
- rpwgp ghyRggpukz pak; -   nfhLkghtp rhfhNsh (xU fpuhkj;J ejp)
- fyhggpupah   -   capuj njOjy; (fyhggpupah ftpi jfs;)
- , skgpi w   -   mrjp (Kjy; kdp\p)

myF – 3 rpWfij jj; njhFgG   **(20 kz pNeuk)**
1. ghujpahu;   -   fhf;fha; ghuypkz l;
                                (kfhftp ghujpahu; fi jfs;)
2. GJi kgpggjd;   -   nghdddlfuk; (GJi kgpggjd; rpWfij fs;)
3. M.khj td;   -   Rrpyhtpd; fi j (M.khj td; fi jfs;)
4. n[afhejd;   -   Nj td; tUthuh? (Nj td; tUthuh?)
5. mNrhfkpj;jpud;   -   mgghtpd; rpNefpju; (mgghtpd; rpNefpju;)
6. tz z jhrd;   -   Myqflpbki o (tz z jhrd; fi jfs;)
7. ehQrpy; ehl d;   -   #ba G+ #lwf (#ba G+ #lwf)
8. v] ;, uhkfpU\ z d;   -   njupej tufs; (v] ;, uhkfpU\ z d; fi jfs;)
9. tz z epytd;   -   , uz ; htJ nrhuffk; (tz z epytd; fi jfs;)
10. mki g   -   gpsh] bf; lgghtpy; guhrfjp Kjy;Nahu;
                                (fhl by; xU khd;)

myF – 4 jkp; , yf;fpa tuyhW   **(15 kz pNeuk)**

- **jkpehL muRg; gz pahsu; NjuthizAk; elj;Jk; Nghlbj; NjuTf;Fupa nghJj; jkpog; ghljjpl;lk; - Xu; mwpKfk;**
1. GJf;ftpi japd; Njhwwk;Kk; tsurrpAk;
2. rpWfij japd; Njhwwk;Kk; tsurrpAk;

3. Gfonowww jkpo; E}yfs;, E}yhrupau;fs; (rpWfij j, GJf;fpj j)
   (ghu;i t E}y; jkpo; , yf;fpa tuyhW)

4. mi lnkhopahy; Fwpffgngwk; E}yfs;, E}yhrupau;fs;
   (ghu;i t E}y; jkpo; , yf;fpa tuyhW)

5. Mq;fpyr; nrhy;yw;F , i z ahd jkpor; nrhy;
   (ghu;i t E}y; ewwkpo; , yf;fz k)

myF – 5   , yf;fz k;   **(12 kz pNeuk)**

1. Nturnrhy; mwpjy;, mfu tupi rggb nrhwpfi s khwwpai kjjy;
2. nra;tpi d, nragghi Ltpi d, cldghL, vjpki w, fyi t thffpaqfSk; thffpa ti ffSk;
3. ngau;, tpi d, , i l, cupnrhwfs;
4. yfu-sfu-ofu, z fu-dfu – NtWghLfs;

ghl E}yfs;
1. nra;As; jpi lL > rpWfi jj; njhFgG
   (jkpoj;Ji w ntspaL : [{d; - 2016)

ghu;i t E}yfs;

- Gytu; ntwwpaofd(njh.M) > " ghupahu; ftpi jfs;" > uhi kah gjpggfk;> nrdi d.
  Kj w; gjpgG: Vguy; - 2008.

- njh.gukrptd(g.M) > " ghupjhrd; ftpi jfs;" > epA+ nrQRup Gf; ` T] > nrdi d.
  %dwhk; gjpgG: brkgu; - 1998.

- tpj;Jthd; rpt fddpaggd > " kyUk; khi yAk;" > GkGfhu; gjpggfk;> nrdi d.
  Kj w; gjpgG: nrgl kgu; - 2002.

- ftpauR fz z jhrd> " , NaR fhtpak;" > fi yf;fhtupap gjpggfk;> jpUrrp
  lejhk; gjpgG: 1997.

- GtpauR> " xU Kffpa mwptpgG" > tp[ah gjpggfk;> Nfhi t.
  , uz ;hk; gjpgG: brkgu; - 2005.

- mg;Jy; uFkhd> " Myhgi d" > Nerdy; ggspNu] > nrdi d.
  ehdfhk; gjpgG: Vguy; - 2003.

- i tuKj;J> " ftph[d; fij " > jpUkfs; gjpggfk;> nrdi d.
  gdpnuz ;hk; gjpgG: nrgl kgu; -2007.

- rpwgp> " xU fphkj;J ejp" > ftpah gjpggfk;> nrdi d. vl ;hk; gjpgG: Mf] ;L-2011.

- fyhggupah> " fyhggupah ftpi jfs;" > jkpopd gjpggfk;> nrdi d.
  Kj w; gjpgG: brkgu; - 2001.

- , skgpi w> " Kjy; kD\p" > jkpo; neQrk;> kapyhLJi u. Kj w; gjpgG: brkgu; -
  2003.

- rpRggukz pa ghup > " kfhftp ghupahu; fi jfs;" > NrJ mykp gpuRuk;> nrdi d.
  , uz ;hk; gjpgG: brkgu;- 2003.

- GJi kggpj jd; fi jfs;> GkGfhu; gjpggfk;> nrdi d. , uz ;hk; gjpgG: [{i y –

2006.

- khj td;> "M.khj td; fi j fs;" > j k[opd[p gj[ggfk;>nrd;i d. Kj w;gj[ngG: brkgu;; 2001.

- n[afhej d;> "Nj td; tUthuh" > k[dhl;r[p Gjj f e[i yak;> kJi u.
ehd;fhk; gj[ngG: [{d; - 1996.

- mNrhfk[pjj[pd;> "mgght[pd; r[pNef[pj u;" > euk[jh nts[paL> nrd;i d.
, uz ;l hk; gj[ngG: brkgu; - 1996.

- tz z jhrd;> fd[pT> rej[pah gj[nggfk;> nrd;i d. , uz ;l hk; gj[ngG: Vguy; - 2011.

- ehQr[py; ehl d;> "#ba G+ #l w;f" > j k[opd[p gj[nggfk;> nrd;i d. %d[whk; gj[ngG:
2010.

- v] ;uhkf[pU\ z d;> "v] ;uhkf[pU\ z d; fi j fs;" > f[pof;F gj[nggfk;> nrd;i d.
, uz ;l hk; gj[ngG: Vguy; - 2005.

- tz z e[pytd;> "tz z e[pytd; r[pWfi j fs;" > ew[wp[i z gj[nggfk;> nrd;i d.
, uz ;l hk; gj[ngG: Mf] ;l L - 2013.

- mk[i g;> "fhl[pby; xU khd;" > fhyr[RtL gj[nggfk;> nrd;i d. %d[whk; gj[ngG:
brkgu; - 2003.

- tyy[pf;fz z d;> "Gj f ft[pi j a[pd; Njhw[wKk; tsur[rp[pAk;" > mfuk;> FkgNfhz k;
ehd;fhk; gj[ngG: [{i y - 1999.

- fh.Nfh.ntq[fl[uhkd;> "jk[p; , yf;f[pa tuyhW" > fi yaf nts[paL> j[pz ;Lf;fy;
, uz ;l hk; gj[ngG: [{d; - 2002.

- kJ.r.t[pkyhdejk;> "jk[p; , yf;f[pa tuyhW" > Kyi y e[pi yak;> nrd;i d. 2014.

- K.gukr[ptk;> "ew[wk[p; , yf;fz k;" > i rtr[pj[jhej   gj[nggfk;> j[pUneyNtyp[Kj w;
gj[ngG: 1995.

SEMESTER - I
French I

Subject code: 16U1FRLT01　　　　**Total Hours: 75**　　　　**No.of Credits: 3**

Prescribed text　　　:　　　ALORS I

Units　　　　　　　:　　　1–5

Authors　　　　　　:　　　Marcella Di Giura
　　　　　　　　　　　　　Jean-Claude Beacco

Available at　　　　:　　　Goyal Publishers Pvt Ltd
　　　　　　　　　86, University Block
　　　　　　　　　　　Jawahar Nagar (Kamla Nagar)
　　　　　　　　　　　　New Delhi – 110007.
　　　　　　　　Tel : 011 – 23852986 / 9650597000

Question Paper Pattern : Semester I

(ALL QUESTIONS TO BE SET ONLY FROM THE PRESCRIBED TEXT)

Maximum Marks: 75　　　　　　　　　Time: 3 hrs.

SECTION A (10)
 CHOISISSEZ LA MEILLEURE RÉPONSE: (10X1=10)

SECTION B (20)
2. TRADUISEZ LES TEXTES SUIVANTS EN ANGLAIS:(4/5) (4X5=20)
(Pg Nos : 26 ex-6,44 ex-3,56 ex-4,74ex-4,80.)

SECTION C (45)
3. COMPRÉHENSION (8x1=8)
4. EXERCICES DE GRAMMAIRE:(5X5=25) (EITHER/OR)
5. FAITES DES PHRASES:(6/8) (6X1=6)

6. TRADUISEZ LES EXPRESSIONS EN ANGLAIS :(6/8) (6X1=6)

SEMESTER - I
Hindi I

Subject code: 16U1HILT01   **Total Hours: 75**   **No.of Credits: 3**

(Prose, Non-detailed , Grammar & Translation)

1. PROSE : NUTHAN GADYA SANGRH

    Editor: Jayaprakash
    (Prescribed Lessons – only 6)
    Lesson 1 – Bharthiya Sanskurthi
    Lesson 3 - Razia
    Lesson 4 – Makreal
    Lesson 5- Bahtha Pani Nirmala
    Lesson 6 – Rashtrapitha Mahathma Gandhi
    Lesson 9 – Ninda Ras.
    Publisher: Sumitra Prakashan
    Sumitravas, 16/4 Hastings Road,
    Allahabad – 211 001.

2. NON DETAILED TEXT: KAHANI KUNJ.

    Editor: Dr.V.P.Amithab.
    (Stories 1 -6 only)
    Publisher : Govind Prakashan
    Sadhar Bagaar, Mathura,
    Uttar Pradesh – 281 001.

3. GRAMMAR : SHABDHA VICHAR ONLY

    (NOUN,PRONOUN, ADJECTIVE, VERB, TENSE,CASE ENDINGS)
    Theoretical & Applied.
    Book for reference : Vyakaran Pradeep by Ramdev.
    Publisher : Hindi Bhavan,
    36,Tagore Town
    Allahabad – 211 002.

4. TRANSLATION: English- Hindi only.

    ANUVADH ABHYAS – III
    (1-15 lessons Only)
    Publisher: DAKSHIN BHARATH HINDI PRACHAR SABHA
    CHENNAI -17.

5. COMPREHENSION : 1 Passage from ANUVADH ABHYAS – III (16- 30)
    DAKSHIN BHARATH HINDI PRACHAR SABHA
    CHENNAI- 17.

SEMESTER - I
Malayalam I

Subject code: 16U1MLLT01 **Total Hours: 75** **No.of Credits: 3**

(Prose, Composition & Translation)

This paper will have the following five units:

Unit I & II - Novel

Unit III & IV - Short story

Unit V - Composition & Translation

Text books prescribed:

Unit I & II - Naalukettu – M.T. Vasudevan Nair
(D. C. Books, Kottayam, Kerala)

Unit III & IV - Nalinakanthi – T.Padmanabhan
(D. C. Books, Kottayam, Kerala)

Unit V - Expansion of ideas, General Essay and Translation of a simple passage from English about 100 words) to Malayalam

Reference books:

1. Kavitha Sahithya Charitram –Dr. M. Leelavathi (Kerala Sahithya Academy, Trichur)

2. Malayala Novel Sahithya Charitram – K. M.Tharakan (N.B.S. Kottayam)

3. Malayala Nataka Sahithya Charitram – G. Sankarapillai (D.C. Books, Kottayam)

4. Cherukatha Innale Innu – M. Achuyuthan (D.C. Books, Kottayam)

5. Sahithya Charitram Prasthanangalilude - Dr. K .M. George, (Chief Editor)

(D.C. Books, Kottayam

SEMESTER - I
LANGUAGE 2: ENGLISH - I

Subject Code: 16U1ENLT01   **Total Hrs: 75**   **No. of Credits: 3**

Objectives:

•   To understand the basic English grammar and to develop vocabulary

•   To develop the skills of speaking and writing without flaws

•   To develop an interest in the minds of the students to enjoy and appreciate the literary works in English

Unit-I: Poetry   **(14 Hrs)**
      1. On His Blindness- John Milton
      2. Menelaus and Helen- Rupert Brooke
      3. The Solitary Reaper- William Wordsworth

Unit-II: Prose   **(16 Hrs)**
      1.Sweets for Angels- R.K.Narayan
      2. At Harrow and Cambridge- Jawaharlal Nehru
      3.The Post Master- Rabindranath Tagore

Unit-III: Short Story   **(15 Hrs)**
      1. How Much Land does a Man Need?- Leo Tolstoy
      2. Games at Twilight- Anitha Desai
      3. The Gate Man's Gift- R.K.Narayan

Unit-IV: One Act Plays   **(13 Hrs)**
 1.A Meeting in a Forest – G.B.Shaw
 2. Refund – Fritz Karinthy

Unit-V: Functional Grammar and Vocabulary   **(17 Hrs)**
      1. Parts of Speech
      2.Simple Past, Perfect and Continuous
      3. Articles
      4. Usage of Idioms & Phrases
      5. Right words- Synonyms, Antonyms, One word Substitutes

Text Books:
 1. A.G . Xavier: An Anthology of Popular Essays and Poems - Macmillan, 2002.
 2. A.E .Subramanian : Gifts to Posterity- An Anthology of Modern Short Stories – Anu Chitra
 Publications, 2003.
 3.K.G .Seshadri : A Prism of Plays - Anuradha Publication,2015.

Reference Books:
 1. N. Krishnaswamy : Modern English- A Book of Grammar Usage and Composition -
 Macmillan,   2007.
 2. K. Ramappa: Essential English Grammar Usage & Composition - MI Publications.
 3. Raymond Murphy: Murphy's English Grammar -Cambridge University Press India Pvt.Ltd,2004.

SEMESTER – I
CORE 1: C PROGRAMMING

Subject Code: 16U1CACT01   **Total Hrs : 75**   **No. of Credits : 5**

Objectives:
> Students would be facilitated

- To learn about the concepts C Programming language.
- To enhance the ability of students in writing C Program using Arrays, Functions, Structures and Pointers.
- To develop the skills of file handling in C Language.

UNIT I   **(Hours- 15)**

> **Overview of C** - Introduction – Structure of C - Character set - C tokens - Keyword & Identifiers - Constants - Variables - Data types - Declaration of variables - Assigning values to variables - Defining Symbolic Constants - Arithmetic, Relational, Logical, Assignment, Conditional, Bitwise, Special, Increment and Decrement operators – **Arithmetic Expressions:** - Evaluation of expression - Procedure of arithmetic operators – Type conversion in expression - operator precedence & associative - Mathematical functions - Reading & Writing a character- Formatted input and output.

UNIT II   **(Hours- 15)**

> **Decision making and Branching** - Decision making with IF statement - simple IF statement - The IF ELSE Statement - Nesting of IF ...ELSE statements - The ELSE IF ladder - The switch statement - The?: operator - The GOTO statement -- Decision Making and Looping - The WHILE statement - The DO statement - The FOR statement – Jumps in Loop:, - **Arrays** - One Dimensional - Two Dimensional - Multidimensional arrays - Character string Handling - Declaring and initializing string variables - Reading strings from technical -- writing strings to Screen - Arithmetic operation on character – Putting strings together - comparison of two strings - String handling Functions - Table of Strings.

UNIT III   **(Hours- 13)**

> **Functions:** User - defined Functions - Need for user Defined functions - A multi function program - The form of C functions - Return values and their types - Calling a function - Category of functions –**Arguments:** No Arguments and no return values - Arguments but no return values - Arguments with return values - Handling of non-integer functions. Nesting of functions - Recursion - Functions with arrays.

UNIT IV   **(Hours- 17)**

> **Structure :** Structure definition - Giving values to members – Structure initialization - comparison of structure variables - Arrays of structures - Arrays within structures - Structures within structures- Structures and functions - unions - size of structures - Bit fields**. Pointers** - Understanding pointers - Accessing the Address of' a variable - Declaring and initializing pointers - Accessing a variable through its pointers - pointer expressions pointer increments and scale factor – pointers and arrays - pointers and character strings – pointers and functions – pointers and structures.

UNIT V   **(Hours- 15)**

File management in C - Defining and opening a file - closing file - I/O operations on files - Error handling during I/0 operations - Random access to files - Command line arguments - The Pre-processor.

Text Books:
1. E. Balagurusamy- **"Programming in ANSI C"** - Tata McGraw Hill – 5th Edition.2011

Reference Books:
s. Byron Gottfried, "Programming with C"- First Edition (Schaum's Outline Series) – Tata McGraw –1998,Hill Publishing Company.
t. Ashok. N. Kamathane, "Programming with ANSI and Turbo C", Pearson Education Asia –2002, First Edition.
3. Yeswanth Kanethkar, "Let us C" Tata McGraw Hill, 1992, First Edition.

SEMESTER – I
CORE 2 : DIGITAL FUNDAMENTALS AND ARCHITECTURE

Subject Code : 16U1CACT02   **Total Hrs : 75**   **No. of Credits : 5**

Objectives:
To Enable the Students

- To know about number system and binary codes.
- To learn about various and digital logics.
- To understand the basics of combinational logic circuits and its operations.
- To know about the sequential circuits and its designing architecture.
- To know about the input-output and memory organization.

UNIT I   **(Hours- 15)**
        Number System and Binary Codes: Decimal, Binary, Octal, Hexadecimal – Binary addition, Multiplication, Division – Floating point representation, Complements, BCD, Excess3, Gray Code. **Arithmetic Circuits**: Half adder, Full adder, Parallel binary adder, BCD adder, Halfsubtractor, Full subtractor, Parallel binary subtractor - Digital Logic: the Basic Gates – NOR, NAND, XOR Gates.

UNIT II   **(Hours- 15)**
        Combinational Logic Circuits: Boolean algebra – Karnaugh map – Canonical form 1 – Construction and properties – Implicate – Don't care combinations - Product of sum, Sum of products, simplifications.

UNIT III   **(Hours- 15)**
        Sequential circuits: Flip-Flops: RS, D, JK, and T - Multiplexers – Demultiplexers – Decoder Encoder - Counters.

UNIT IV   **(Hours- 15)**
        Input – Output Organization: Input – output interface – I/O Bus and Interface – I/O Bus Versus Memory Bus – Isolated Versus Memory – Mapped I/O – Example of I/O Interface. **Asynchronous data transfer**: Strobe Control and Handshaking – Priority Interrupt: Daisy-Chaining Priority, Parallel Priority Interrupt. Direct Memory Access: DMA Controller, DMA Transfer. Input – Output Processor: CPU-IOP Communication.

UNIT-V   **(Hours-15)**
        Memory Organization: Memory Hierarchy – Main Memory- Associative memory: Hardware Organization, Match Logic, Read Operation, Write Operation. Cache Memory: Associative, Direct, Set-associative Mapping – Writing into Cache Initialization. Virtual Memory: Address Space and Memory Space, Address Mapping Using Pages, Associative Memory Page Table, Page Replacement.

Text Books

1. Digital Electronics Circuits and Systems - V.K. Puri, TMH,TwentyThird Edition,2012.
2. Computer System Architecture –Morris Mano,PHI,Third Edition,2008.

Reference Books

1. Digital Principles and Applications, Albert Paul Malvino, Donald P Leach, Tata McGraw Hill, Sixth Edition-   2008.
2. Computer Architecture, Carter, Schaum's outline series, Tata McGraw Hill,2006.

SEMESTER – I
CORE 3 : C PROGRAMMING - PRACTICAL

Subject Code : 16U1CACP03   **Total Hrs : 45**   **No. of Credits : 3**

LIST OF PRACTICAL PROGRAMS:

1. Write a C program to find the Quadratic equation.

2. Write a C program to find the sum of a given digit number.

3. Write a C program to find the sum, Average & Standard Deviation.

4. Write a C program to find the Simpsons and Trapezoidal rule.

5. Write a C program to perform Matrix Multiplication Table using Arrays

6. Write a C program to perform string manipulation operations.

7. Write a C program to perform Matrix Manipulation using Arrays.

8. Write a C Program to check whether the given string is a palindrome or not using Pointers.

9. Write a C program to print Fibonacci Series using Recursive Function

10. Write a C program to print the student's mark sheet assuming roll number, name, marks in 5 subjects in a structure. Create an array of structures and print the mark sheet in the university pattern.

11. Write a C program to print the inventory management using file manipulation.

12. Write a C program to prepare the Electricity Bill using Files

SEMESTER : I

ALLIED 1: NUMERICAL METHODS AND STATISTICS

Subject Code:16U1CAAT01   **Total Hrs: 75**   **No. of Credits: 4**

Objectives*:*
- To understand the different Methods of solving numerical algebraic and Transcendental Equations .
- To know Numerical differentiation using various formulae and Integration using various rules.
- To have a knowledge of finding numerical solutions of ordinary differential Equations
- To learn how to calculate various statistical constants.

UNIT I   **(12 Hrs)**

The Numerical Solution of Algebraic and Transcendental Equations –The Bisection method, The method of false position , Newton – Raphson method.

UNIT II   **(18Hrs)**

Solution of Simultaneous Linear Algebraic Equations – Gauss Elimination method, Gauss Jordan method, Gauss – Jacobi method, Gauss – Seidel method. Interpolation (For Equal Intervals) Newton's Forward interpolation, Newton's Backward interpolation.

UNIT III   **(18Hrs)**

Numerical Differentiation – Newton's Forward formula, Newton's Backward Formula, Numerical Integration – Trapezoidal Rule, Simpson's one third rule, Simpson's three-eight's rule. Numerical solution of Ordinary differential equations – Taylor Method (first order)– Runge-Kutta method (fourth order)

UNIT IV   **(15Hrs)**

Measure of Central Tendency – Mean, Median, Mode - Measure of Dispersion – Range, Quartile Deviation, Standard Deviation and Mean Deviation -problems.

UNIT V   **(12Hrs)**

Correlation and Regression. No derivation required.

Questions in problems and theory carry 80% and 20% marks respectively.

Text Book:

1.P. Kandasamy, K.Thilagavathy, K.Gunavathi: Numerical methods, S.Chand & Company-2005
2. P.A. Navanitham :Business Mathematics and Statistics. Jai publishers- 2005 .

Unit I	: Chapter 3 (3.1, 3.1.1, 3.3, 3.3.1, 3.4, 3.4.1 – 3.4.3),
Unit II	: Chapter 4 (4.1, 4.2, 4.2.1, 4.8, 4.9)
	Chapter 6 (6.1, 6.2, 6.3).
Unit III	: Chapter 9 (9.1 – 9.3, 9.9, 9.13, 9.14),
	Chapter 11 (11.5, 11.6, 11.7, 11.12, 11.13)
Unit IV	: Chapter 7**,** Chapter 8.
Unit V	: Chapter 12 and Chapter 13.

Reference Books:
1. Dr.M.K. Venkataraman: Engineering MathematicsVolume II , National publishing company-2005
2. R.S.N. Pillai and V. Bhagavathi: Statistical Methods , Sultan chand and Sons company- 2005.

3. P.R.Vittal :Business Mathematics,Margham Publications -1999.
4. A.Singaravelu :Numerical Methods, Meenakshi Publications-2001

SEMESTER - I
VALUE BASED EDUCATION - 1 : ENVIRONMENTAL STUDIES

Subject Code:16U1VBET01   Total Hrs: 30   No. of Credits: 2

Objectives*:*
- To make the students understand the various types of natural resources and their responsibility the conservation of the same.
- To impart on various eco systems, biodiversity at various levels and their conservation.
- To make the students know on various types of environmental pollution, their causes , effects, their prevention and the students role in the same.

UNIT I
(6 Hrs)

The Multidisciplinary Nature of Environmental Studies - Definition, Scope and Importance; Need for public awareness, Natural resources - Forest resources, Mineral resources, Food resources, Energy resources and Land resources. Role of an individual in conservation of natural resources. Equitable use of resources for sustainable life style.

UNIT II   **(6 Hrs)**

Ecosystems - Concept of ecosystem, Structure and Functions of an ecosystem. Producer, Consumer, Decomposers, Energy flow in ecosystem, Ecological succession, food chain, food webs and ecological pyramids. Introduction, types, characteristics, features, structure and functions of forest ecosystem, grass land, desert and Aquatic Ecosystems (ponds, streams, lakes, rivers, oceans and estuaries).
UNIT III   **(6 Hrs)**

Biodiversity and its Conservation – Introduction - Definitions: 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-biodiversity nation. Hot spots of biodiversity. Threads of biodiversity: habitat loss, poaching of wild life. Man wild life conflicts. Endangered and endemic species of India. Conservation of biodiversity-insitu and Exsitu conservation of biodiversity.

UNIT IV   **(6 Hrs)**

Environmental Pollution - Definitions, causes, effects and control measures of Air pollution, Water pollution, Soil pollution, Noise pollution and Thermal pollution. Solid waste management: causes, effects and control measures of Urban and Industrial wastes. Role of an individual in prevention of pollution. Pollutions case studies. Disaster management: Foods, Earthquake, Cyclone and Landslides.

UNIT V   **(6 Hrs)**

Social issues and the Environment - Sustainable development, urban problems related to energy, water conservation, rain water harvesting, water shed management. Resettlement and rehabilitation

of people. Environmental ethics: issues and possible solution. Climate change, global warming, ocean layer depletion, acid rain, nuclear accident and holocaust, case studies. Consumerism and waste product. Environmental protection Act. Air (prevention and control of pollution) Act. Wild life protection act. Forest conservation Act. Issues involved in enforcement of environmental legislation. Public awareness. Human population and the environment.

Text Book:
1. Prof R. Ranganathan: Environmental Studies. Bharathiar University Publications- Edition-1.

Reference Books:
 1. Ritu Bir : "Environmental Studies", Vayu Education of India, 2011.
 2. Erach Bharucha : "Textbook for Environmental Studies", University Press India Pvt. Ltd, 2006.
 3. Anubha Kaushik & C.P.Kaushik:Perspectives in Environmental Studies- New Age International Publishers, 2006.

SEMESTER - II
LANGUAGE 1: TAMIL II

Subject Code: 16U2TALT02   **Total Hrs: 75**   **No. of Credits: 3**

,uz Jhk; gUtk; (nraAs; ci uei l, ,yf;fz k;, ,yf;fpa tuyhW)
Nehf;fk;
1. rqf ,yf;fpajjpd; khz G, ,yf;fpa eak;ejJp newpfs;gfjpapd;jdi k, rqffhy ,yf;fz newpfs; Mfpatwi w mwpej nfhsSjy;
* thofi fi a thOk; newpKi wfs> ntwwpffhd cjjpfs> jkp tsurpfhd ekJ fl i kfs; Mfpad Fwpj;J njspjT ngWjy;

myF – 1 nraAs; jpil : rqf ,yffaqfs;   **(20 kz Neuk)**
* FWenjhi f   - Kjy; 5 ghl yfs; (flTs; thoj;J clgl)
* ewwpi z   - gpurqfyej ntz Ri tjjifghy; (gh.vz;110),
                  tpi sahL MaNkhL (gh.vz;68)
* fypjjnjhi f   - Rl uj; njhB, Nfsha; (gh.vz;51)
* GwehD}W   - MTkhdpa ghuggd khf;fSk;(gh.vz;9),
                  fha; neyyW ftsk; mWj;Jfnfhspd (gh.vz;184)
* gj;Jgghl L   - FwpQrpgghl L KOtJk;

myF – 2 nraAs; jpil : eJp gfjp ,yffpak;   **(15 kz Neuk)**
* jpUffWs;   - mlffKi li k (mjpfhuk;13),
                  Gwqs$whi k (mjpfhuk;19)
* ehybahu;   - fy;tp (mjpfhuk;14), eyypdk; NrUjy(mjpfhuk;18)
* jpUntkghi t   - Kjy; 10 ghl yfs;
* ehrrpahu; jpUkhoy   - Mwhk; jpUkhoy

myF – 3 ci uei l: flLi uj; njhFgG   **(15 kz Neuk)**
1. ,i wadG   - fy;tpAk; flTs; jdi kAk;
                      (thofi fNa xU topghL)
2. mfpyd;   - gjpdhW NgWfs;(ntwwpapd; ufrpaqfs)
3. Ki dtu; ghQ;, uhkypqfk; - khdpl cstpay; (khdpl cstpay;)
4. t.nr.Foei jrhkp   - jkp topffytpjaffqfs;ji lfs;
                      (jkp tsurp)
5. kz i t K]jgh   - jkpOf;F mwptpay; mddpakh? (mwptpay;
                      Nehf;fpy; fkgu)
6. Rfpurptk;   - thoggoFNthk; thUq;fs;
                      (thoggoFNthk; thUq;fs;)
7. m.kqi f   - ngz zpak; gilgG, thrpgG
                      (ngz ; - muqfk; - jkpor#oy;)

myF – 4 ,yf;fpa tuyhW   **(15 kz Neuk)**
* vlLjnjhi f, gj;Jgghl L E}y;fs;

- eJ|p E}y;fs; - mwpKfk;
- ehadkhu;fs; Mo;thu;fs; - mwpKfk;
- ci uei lapd; NjhwwKk; tsurrpAk;

myF – 5 , yf;fz Kk; gadghlLj; jkpOk; (10 kz pNeuk)
- mfk; Gwk; – jpi z , Ji w tpsffqfs;
- Kjy;, fU, cupgnghUs;
- klyfs; tpz z ggqfs;
- nkhopngaugG (mYtyfg; gFjp, nghJggFjp)

ghl E}y;fs;
- nra;As; jpulL > flLiuj; njhFgG
  (jkpoj;Ji w ntspaL : brkgu; - 2016)

ghujt E}y;fs;
- FWehjhi f> fof ntspaL> Kjw; gjpgG: [{d; - 2000
- Gytu; eh., uhi kahgpsi s(c.M)> "ewpi z " > tujjkhdd; gjpggfk> nrdid. Kjw; gjpgG: 1999.
- fypj njhi f> fof ntspaL> Kjw; gjpgG: brkgu; - 1996.
- GwehD}W> fof ntspaL> Kjw; gjpgG: brkgu; - 1996.
- Gytu; m.khz pffdhu (c.M)> "gj;Jgghl;L – II Mk; njhFjp" > tujjkhdd; gjpggfk> nrdid. 1999.
- Nguh.m.khz pffk(g.M)> "ehybahu" > kz pthrfu; gjpggfk> nrdid. Kjw; gjpgG: nrglkgu;1995.
- Nguh.m.khz pffk(c.M)> "gdddpU jpUKi wfs; (njhFjp 11)" > tujjkhdd; gjpggfk> nrdid. gpgutup - 2009.
- Ihf;lu; fjpuKUF> "ehrrpahu; jpUnkhop" > rhujh gjpggfk> nrdid. Kjw; gjpgG: [{d; - 2010.
- nt., i wadG> "thof;i fNa xU topghL" > tp[ah gjpggfk> Nfhi t. vlhk; gjpgG: brkgu; - 2013.
- mfpyd> "ntwwpapd; ufrpaqfs;" > jhfk; gjpggfk> nrdid. gpndhdwhk; gjpgG:[dtup – 2001.
- Ki dtu; ghQ;, uhkypqfk> "khdpl cstpay;" > rhujh gjpggfk> nrdid. jpUjjpa gjpgG: [{d; 2007.
- t.nr.Foei jrhkp> "jkpo; tsurrp" > ghujp gjpggfk> nrdid. , uz lhk; gjpgG:[{i y – 2007.

- K z i t K] j gh> "mw pt ay; Nehf;f y; fkgu;"> thdj p gj gggfk> nrd i d. , uz l hk; gj gG: 2003.

- Rf r tk>" thoggoFNthk; thUq fs;" > thdj p gj gggfk> nrd i d. Mwhk; gj gG: etkgu; - 2003.

- M.kq i f> "ngz ;muq fk;j k por #oy;">] Nefh gj gggfk> nrd i d. K j wgj gG:2005.

- fh.Nfh.ntq fl uhkd> "j k po; , yf;f a tuyhW" > fi yaf nts al> j z l f;fy; , uz l hk; gj gG: [{d; - 2002.

- kJ.r.t kyhd ej k> "j k po; , yf;f a tuyhW" > K y i y ep i yak> nrd i d. 2014.

- K.gukr tk> "eww k po; , yf;fz k;" > i rtr j j hej gj gggfk> j UneyNty; K j wgj gG:1995.

SEMESTER - II
French II

Subject code: 16U2FRLT02   **Total Hours: 75**   **No.of Credits: 3**

Prescribed text   : ALORS I

Units : 6 – 10

Authors   : Marcella Di Giura
                    Jean-Claude Beacco

Available at   : Goyal Publishers Pvt Ltd
                          86, University Block
                          Jawahar Nagar (Kamla Nagar)
                          New Delhi – 110007.
                    Tel : 011 – 23852986 / 9650597000

Question Paper Pattern : Semester II
(ALL QUESTIONS TO BE SET ONLY FROM THE PRESCRIBED TEXT)

Maximum Marks: 75   Time: 3 hrs.

SECTION A (10)
 1. CHOISISSEZ LA MEILLEURE RÉPONSE: (10X1=10)

SECTION B (20)
 2. TRADUISEZ LES TEXTES SUIVANTS EN ANGLAIS:(4/5) (4X5=20)
    (Pg Nos :86 ex-4,104 ex-3,116 ex-3a,b,134 ex-4,146 ex-2,162,163,164,165,166,167)

SECTION C (45)
        3. COMPRÉHENSION (8x1=8)
        4. EXERCICES DE GRAMMAIRE:(5X5=25) (EITHER/OR)
        5. FAITES DES PHRASES:(6/8) (6X1=6)
        6. TRADUISEZ LES EXPRESSIONS EN ANGLAIS :(6/8) (6X1=6)

SEMESTER - II
Hindi II

Subject code: 16U2HILT02   **Total Hours: 75**   **No.of Credits: 3**

(Modern Poetry, One Act Play , Translation & Letter Writing)

1. MODERN POETRY ; Draupadi by Narendra Sharma

 PUBLISHER   :   Rajkamal Prakashan,
                                        1B Nethaji Subash Marg,
                                        New Delhi.

2. ONE ACT PLAY: EKANKÏ SANKALAN – Lesson ''Strike' omitted

                            By Veerendra kumar mishra

 PUBLISHER   :   VANI PRAKASHAM

                                        NEW DELHI – 110 002.

3. TRANSLATION   :   HINDI – ENGLISH ONLY,

                                          (ANUVADH ABYAS – III)

                                        Lessons.1 – 15 only

 PUBLISHER   :   DAKSHIN BHARATH HINDI PRACHAR SABHA

                                        CHENNAI – 600 017.

4. LETTER WRITING   :   (Leave letter, Job Application, Ordering books,

                                        Letter to Publisher, Personal letter)

5. CONVERSATION   :   (Doctor & Patient, Teacher & Student, Storekeeper &

                                        Buyer, Two Friends, Booking clerk & Passenger at Railway

          station, Autorickshaw driver and Passenger)

Reference: Bolchal Ki Hindi Aur Sanchar by Dr. Madhu Dhavan, Vani Prakashan, New Delhi.

SEMESTER - II

Malayalam II

Subject code: 16U2MLLT02   **Total Hours: 75**   **No.of Credits: 3**

(Prose : Non-fiction)

This paper will have the following five units:

Unit I & II   -   Biography

Unit III, IV & V   -   Smaranakal

Text books prescribed:

Unit I & II   -   Kanneerum Kinavum- V.T.Bhatahirippad

(D.C. Books, Kottayam)

Unit III, IV & V   -   Balyakalasmaranakal – Madhavikkutty

(D.C. Books, Kottayam)

Reference books:

1. Jeevacharitrasahithyam – Dr. K.M. George (N.B.S. Kottayam)

2. Jeevacharitrasahithyam Malayalathil – Dr. Naduvattom Gopalakrishnan (Kerala Bhasha Institute, Trivandrum)

3. Athmakathasahithyam Malayalathil – Dr. Vijayalam Jayakumar (N.B.S. Kottayam)

4. Sancharasahithyam Malayalathil – Prof. Ramesh chandran. V, (Kerala Bhasha Institute, Trivandrum)

SEMESTER - II
LANGUAGE 2: ENGLISH II

Subject Code:16U2ENLT02   **Total Hrs: 75**   **No. of Credits: 3**

Objectives:
- To understand the basic English grammar and to develop the skill of constructing various sentences.

- To develop the skills of speaking and writing without flaws.

- To develop an interest in the minds of the students to enjoy and appreciate the literary works in English**.**

Unit-I:Poetry   **(14 Hrs)**
    1. Stopping by Woods on a Snowy Evening- Robert Frost
    2. Laugh and Be Merry- John Masefield
    3. The Ballad of Father Gilligan- William Butler Yeats

Unit-II: Prose   **(16 Hrs)**
    1. The Selfish Giant- Oscar Wilde
    2. My lost Dollar- Stephen Butler Leacock
    3. The Golden Touch- Nathaniel Hawthorne

Unit-III: Short Story   **(15 Hrs)**
    1. Some Words with a Mummy- Edgar Allan Poe
    2.The Open Window- H.H. Munro
    3. The Ant and the Grasshopper- W. Somerset Maugham

Unit-IV: One Act Plays   **(13 Hrs)**
    1. The Hour of Truth – Percival Wilde
    2. The Count's Revenge – J.H. Walsh

Unit-V: Functional Grammar & Composition   **(17 Hrs)**
    1. Active and Passive Voice
    2. Models Auxillaries: Will, Would, Shall, Should
    3. Reading Comprehension
    4. Notices, Preparation of Agenda, Minutes, Telegrams
    5. Hints Development

Text Books:
1. A.G . Xavier: An Anthology of Popular Essays and Poems - Macmillan, 2002.
2. A.E .Subramanian : Gifts to Posterity- An Anthology of Modern Short Stories – Anu Chitra Publications, 2003.
3. K.G .Seshadri : A Prism of Plays - Anuradha Publication,2015.

Reference Books:
1. N. Krishnaswamy : Modern English- A Book of Grammar Usage and Composition - Macmillan,   2007.
2. Raymond Murphy: Essential English Grammar - Cambridge University Press India Pvt.Ltd,2012.
3. RajendraPal & J. S. Korlahalli : Essentials of Business Communication -Sultan Chand & Sons Publishers, 2011.

SEMESTER – II
CORE 4 : C++ PROGRAMMING

Subject Code : 16U2CACT04   **Total Hrs: 75**   **No. of Credits: 5**

Objectives:
- To provide knowledge on Object-Oriented Programming Concepts using C++.
- To learn about the concepts like Abstraction, Encapsulation, Inheritance, and Polymorphism.
- To enhance the students knowledge in writing C++ Programs and the concepts of File Handling

UNIT I   **(Hours- 15)**

Introduction of C++ - Key Concepts – OOP advantage – OOP language – I/O in C++- C++ declarations. Control Structures: Decision Making statements: if, else, jump, go to, break, continue, Switch case statements. Loops in C++: for, While, do, while loops. Functions in C++ - inline function.

UNIT II   **(Hours- 15)**

Classes and objects: Declaring Objects – defining member functions – static member Variables and functions – arrays of objects – friend functions – overloading member functions – Bit fields and classes - Constructors And Destructors with static members.

UNIT III   **(Hours- 14)**

Operator overloading: overloading unary, binary operators – overloading friend function – type conversion. Inheritance: Types of Inheritances – single, multilevel, multiple, hierarchical, hybrid, and Multipath inheritance – virtual base classes – abstract classes.

UNIT IV   **(Hours- 16)**

Pointers – Declarations – Pointer to class , object – this pointer – pointer to derived classes and base classes – Arrays – characteristics – arrays 0f classes – Memory modals – new and delete operators – dynamic objects – Binding , Polymorphism and virtual Functions.

UNIT V   **(Hours- 15)**

Files – File Stream classes – File modes – Sequential Read / Write operations – Binary and ASCII files – Random access operation – Templates – Exception handling – Strings – declaring and initializing string objects – string attributes – miscellaneous functions.

Text Books

1. Ashok N Kamthane, - "Object oriented Programming with ANSI and Turbo C++", Pearson Education Publications, 2003, First Edition.
2. Merbert Schildt, - "Teach your self C++" 3rd Edition, Tata McGraw Hill, 2000.

Reference Books

1. E.Balagurusamy, "Object Oriented Programming with C++", Tata McGraw Hill Publishing Ltd., New Delhi, 2002.
2. Robert Lafore, "Object Oriented Programming in C++", - Galgotia, 1994.
3. Yeswant Kanetkar, "Let us C++", BPB Publications, 1999.
4. John R.Hubbard, "Programming with C++", Schaum's Outline Series, 1996.

SEMESTER – II
CORE 5: DATA STRUCTURES

Subject Code : 16U2CACT05   **Total Hrs : 60**   **No. of Credits : 5**

Objectives:
- To make the students to understand the basic concepts of Data Structures and Algorithm.
- To understand the concepts of Stack, Queue and Linked List.
- To enhance the students knowledge in developing Algorithms using stack, queues, lists, matrices, searching and sorting.

UNIT I   **(Hours- 10)**
  Introduction - Overview - How To Create Programs Analyze Them. Arrays - Structures - Ordered Lists - Representation of Arrays - Simple Applications.

UNIT II   **(Hours- 12)**
  Stacks and Queues - Fundamentals – Structure - Operations - Multiple Stacks And Queues. Applications Evaluation of Expressions.

UNIT III   **(Hours- 14)**
  Linked Lists - Single Linked Lists- Linked Stacks And Queues - The Storage Pool - Applications - Polynomial Addition, Sparse Matrices. Double Linked Lists- Dynamic Storage Management -Garbage Collection And Compaction.

UNIT IV   **(Hours- 13)**
  Searching and Sorting: Binary, Sequential, And Fibonacci - Internal Sorting Insertion, Quick, Merge, Heap, Radix Sorts - External Sorting - Sorting With Disks – K-way Merging- Sorting With Tapes - Balanced Merge – Polyphase Merge. Symbol Tables - Static Tree - Dynamic Tree - Hash Tables.

UNIT V   **(Hours- 11)**
  Files - Queries and Sequential Organizations - Index Techniques. File Organizations Sequential, Random, Linked Organizations - Inverted Files – Cellular Partitions.

Text Book:
1. Ellis Horowitz & Sartaj Sahani - "Fundamentals of Data Structure" Galgothia book source, 2008, First Edition.

Reference Books:
1. Ashok N Kamthane,-"Programming and Data Structures", Pearson Education, 2004, First   Edition.

SEMESTER – II
CORE 6: DATA STRUCTURES & C++ PROGRAMMING - PRACTICAL

Subject Code : 16U2CACP06　　　　**Total Hrs : 60**　　　　**No. of Credits : 3**

PRACTICAL LIST

1. Write a simple C++ Program using Classes and Objects.

2. Write a C++ Program to create a class to implement the Data Structure STACK. Write a constructor to initialize the TOP of the STACK. Write a member function PUSH () to insert an element and member function POP () to delete an element check for overflow and underflow conditions.

3. Write a C++ Program to implement a data structure Queue Operation.

4. Write a C++ Program to read an integer number and find the sum of all the digits until it reduces to a single digit using constructors, destructors and inline member functions.

5. Write a C++ Program to create a class FLOAT that contains one float data member. Overload all the four Arithmetic operators so that they operate on the object FLOAT.

6. Write a C++ Program to create a class STRING. Write a Member Function to initialize, get and display stings. Overload the Operator "+" to concatenate two Strings, "==" to Compare two strings.

7. Write a C++ Program to create class, which consists of EMPLOYEE Detail like E_Number,E_Name, Department, Basic, Salary, and Grade. Write a member function to get and display them. Derive a class PAY from the above class and write a member function to calculate DA, HRA and PF depending on the grade.

8. Write a C++ Program using Function Overloading to read two Matrices of different Data Types such as integers and floating point numbers. Find out the sum of the above two matrices separately and display the sum of these arrays individually.

9. Write a C++ Program to create a File and to display the contents of that file with line numbers.

10. Write a C++ Program to merge two files into a single file.

11. Write a C++ Program to count the total nodes of the *LINKED LIST*.

12. Write a user defined function USERFUN ( ) which has the formatting commands like

setw ( ), showpoint, showpos, precision ( ). Write a program which prints multiplication table and

uses USERFUN ( ) for formatting.

SEMESTER : II
ALLIED 2 : DISCRETE MATHEMATICS

Subject Code:16U2CAAT02   **Total Hrs: 75**   **No. of Credits: 4**

Objectives*:*
- To understand the concept of set theory, Logic and Relations
- To learn the concept of languages and Grammars
- To know the concept of Graph theory and its applications

UNIT I   **(12Hrs)**
        Set Theory - Types of sets - Venn - Euler Diagrams - Set operations & Laws of set theory - Fundamental Products - Partitions of Sets – Minsets - Algebra of sets and Duality - Inclusion and Exclusion Principle.

UNIT II   **(15Hrs)**
        Mathematical Logic – Introduction - Propositional Calculus – Basic logical Operations - Tautologies – Contradiction – Argument - Predicate Calculus.

UNIT III   **(18Hrs)**
        Relations – Binary Relations – Set operation on relations - Types of Relations – Partial order relation – Equivalence relation – Functions – Types of functions – Invertible functions.

UNIT IV   **(18Hrs)**
        Languages – Operations on Languages – Grammar – Types of Grammars – Finite State Machine – Finite State Automata.

UNIT V   **(12Hrs)**
        Graph Theory – Basic terminology – Paths, Cycle & Connectivity – Sub graphs – Types of Graphs – Representation of Graphs in Computer Memory - Trees – Properties of Trees – Binary trees- Traversing Binary Tree.

Text Book:
   1.J.K. Sharma : Discrete Mathematics ,Macmillan India Ltd – 2007
    Unit I   : Chapter 1   Section - 1.1, 1.4, 1.5, 1.6, 1.7, 1.9, 1.10, 1.12, 1.13, 1.14
    Unit II : Chapter 12 Section - 12.1, 12.2, 12.3, 12.8, 12.9, 12.11, 12.14
    Unit III: Chapter 3   Section - 3.3, 3.4, 3.5, 3.6, 3.7.
                 Chapter 4   Section - 4.3, 4.4.
    Unit IV : Chapter 15 Section - 15.3, 15.3.1, 15.5, 15.5.2, 15.6, 15.7
    Unit V   : Chapter 9   Section - 9.2, 9.3, 9.4, 9.5, 9.8
                 Chapter 10 Section - 10.2, 10.3, 10.6, 10.8

Reference Books:
   1. J. P Tremblay R Manohar: Discrete Mathematics Structures with Applications to Computer Science Mc Graw Hill International Publications. –Edition 2006.
   2. Dr.M.K.Venketaramen,Dr.N.Sridharan,N.Chandarasekaran:DiscreteMathematics,
   The National publishing Company - 2006.
   3. V.Sundaresan : Discrete Mathematics ,A.R.Publications - 2001
   4. M.K.Chandborthy: Introduction to Discrete Mathematics, Books and Allied Pvt.Ltd.- 2005

SEMESTER - II
VALUE BASED EDUCATION – 2
ETHICS AND CULTURE
kj,gg™Lf; fy;tp - mwtpaYk; gz ghLk;

Ethics and Culture (kdpj ts khz G-jdpkdpj tpOkpaqfs;, rKjha

tpOkpaqfs;)

Subject Code: 16U2VBET02   **Total Hrs: 30**   **No. of Credits: 2**
Nehf;fk;

- xtnthUtUk; jdid caujjpf; nfhz;L, rKjha kffS ld;, zffkhf
  thoeJ rKjhaji jAk; caujj Ntz;Lk; cddj , ylrpajjpwfhf
  thoeJ ekJ thofi fi a mujjKssjhf Mffpf; nfhss Ntz;Lk;

- Fti yfF Mjhukhd Mi r kwWk; rpdk; Mfpatwi wj; jtpuggjd; %yk;
  fti yi a xojggjwfhd gapwrp ngWjy;

- fy;tp; murpay> nghUshjhuk; kwWk; tpQQhdk; Mfpatw;Wf;Fk;
  rKjhajjwFk; css njhlugid mwpeJ nfhs;Sjy;

myF – 1   **(5 kz Neuk)**

kdpj ts khz gpd; mtrpak; - FwpfNfhs;, kjpgGfs; - tho;tpd; Nehf;fKk;
jj;JtKk; - thofi fj; Nji tfs;, fhgGfs; - mwnewpfs;, mwptpd; epi yggbfs;

myF – 2   **(5 kz Neuk)**

vz z k; Muhjy; - vz z k; voffhuz qfs; - vz z k; Muhjy; gapwrp – Mi r
rbi kjjy; - Mi r rbi kjjy; gapwrp.

myF – 3   **(5 kz Neuk)**

rpdk; jtpujjy; - rpdjjpd; tpi sTfs; - rpdk; jtpujjy; gapwrp – fti y
xojjy; - fti yapd; ti ffSk; tpi sTfSk; - fti y xojjYf;fhd gapwrp

myF – 4   **(8 kz Neuk)**

kdpj dpd; gupz hkk; - gpugQr jdkhwwk; - cau;pdj; jdkhwwk; - Mwhk; mwtpd;
NkkghL – kdpj NtWghLbw;fhd fhuz qfs; - VO rkgj;Jfs; - gjpdhW
fhuz qfs; - kdj; J}a;ik k jUk; rKjha eyd;, mwthoT – fUi kajjpd;
rpwggpayGfs; - ghtggpjTfSk;, Nghf;Fk; topfSk;

myF – 5   **(7 kz Neuk)**

fy;tp}Ak; rKjhaKk; - fy;tpapd; rKjha Nehf;fq;fs; - fy;tpapd; rKjhag;
gz p}fs; - munpaYk; rKjhaKk; - nghUshjhuKk; rKjhaKk; - tpQ,Qhd;Kk;
rKjhaKk; - mwptpaYk; Mdkp}fKk;

ghI E}y;fs;

1. jdkdj tpOkpaq;fs> kdj ts khz Gf; fy;tpf;fhd jdp ntspaL,
   vd;[pvk; fy;Y}up nghss;shrrp 2015.

2. rKjha tpOkpaq;fs> kdj ts khz Gf; fy;tpf;fhd jdp ntspaL,
   vd;[pvk; fy;Y}up nghss;shrrp 2014.

ghujt E}y;fs;

1. tho;tpay; tpOkpaq;fs> Ntjhjj]jup gj]ggfk;,<NuhL.
   gj]ndhdwhk; gj]gG: 2013

2. kdtsfffi y Nahfh> c yf rKjha Nrth rq;fk;,Ntjhjj]jup gj]ggfk;,
   nghss;shrrp gj]ndhdwhk; gj]gG: [{i y – 2015.

SEMESTER – III
CORE 7: OPERATING SYSTEMS

Subject Code: 16U3CACT07   **Total Hrs:75**   **No. of Credits: 4**

Objectives:
- To gain knowledge on OS concepts and functioning of modern OS.
- To understand the structure of OS , process and Inter process Communications
- To understand the deadlock & Memory management concepts

UNIT I   **(Hours - 15)**
        Introduction: What is OS -History of OS -Computer Hardware Review- OS Concepts: Processes-Deadlocks-Memory Management-I/O-Files-Security-The Shell-Recycling Concepts.

UNIT II   **(Hours - 15)**
 OS Structure: Monolithic Systems- Layered Systems- Virtual Machines- Exo Kernels-Client Server Models. Processes: The Process Model-Process Creation-Process Termination-Process States. Threads: The Thread Model-Thread Usage-Implementing Threads In User Space & Kernel Space-Hybrid Implementations-Scheduler Activations-Pop-Up Threads-Making Single-Threaded Code Multithreaded.

UNIT III   **(Hours - 15)**
        Inter process Communication: Race Condition-Critical Regions-Mutual Exclusion With Busy Waiting-Sleep & Wakeup-Semaphores-Message Passing- Mutexes-Monitors-Barriers. Classical IPC Problems: The Dining Philosophers Problem-The Readers and riters Problems-The Sleeping Barber Problem. Scheduling: Introduction to Scheduling-Scheduling Batch Systems-Scheduling in Interactive Systems—Scheduling in Real-Time Systems-Policy versus Mechanism-Thread Scheduling.

UNIT IV   **(Hours: 15)**
        Deadlocks: Introduction, Deadlock Detection And Recovery: Deadlock Detection With One Resource of Each Type- Deadlock Detection With Multiple Resources of Each Type-Recovery From Deadlock. Deadlock Avoidance: Bankers Algorithm for Single Resource, Bankers Algorithm for Multiple Resources. Dead Prevention: Attacking the Mutual Exclusion Condition- Attacking the Hold and ait Condition- Attacking the No Preemption Condition-Attacking the Circular Wait Condition.

UNIT V   **(Hours -15)**
        Memory Management: Virtual Memory-Paging-Page Tables-Page Replacement Algorithm: The Optimal Page Replacement Algorithm-The Not Recently Used Page Replacement Algorithm- The First In First Out-The Second Chance Page Replacement Algorithm-The Clock Page Replacement Algorithm-The Least Recently Used. File Systems: Files: File Naming- File Structure-File Types—File Attributes-File Operation. Directories: Single Level Directory Systems-Two Level Directory Systems-Hierarchical Directory Systems.

Text Book

1. Andrew S. Tanenbaum, "**Modern Operating Systems**", Prentice Hall of India Pvt. Ltd, 2003.

Reference Book

1. Harvey M. Deitel, "**Operating Systems**", Second Edition, Pearson Education Pvt. Ltd, 2002.
2. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, "Operating System Concepts", 6th Edition, John Wiley & Sons (ASIA) Pvt. Ltd, 2003.

SEMESTER – III
CORE 8: JAVA PROGRAMMING

Subject Code: 16U3CACT08   **Total Hrs: 75**   **No. of Credits: 4**

Objectives :
- To understand fundamentals of object – oriented programming in Java, including defining classes, invoking methods, using class libraries, etc.
- To be able to use the Java SDK environment to create, debug and run simple Java programs.
- To understand the Java Programming concepts so as to enable the students of Applications and Applets using Java

UNIT I   **(Hours - 15)**
Introduction to Object-Oriented Programming : Fundamentals – Object oriented Paradigm – Basic concepts of OOP – Benefits of OOP – Applications of OOP – **Java Evolution** : History – Features – Difference between Java, C,C++ - Java and Internet – Java and WWW – Web Browsers . **Overview** : Simple Java Program - Structure – Java Tokens- Statements -JVM

UNIT II   **(Hours - 15)**
Constants – Variables – Data types – Operators and Expressions – Decision Making and Branching :if, if...else, nested if, switch – Decision making and looping : while, do, for – Jumps in Loops – Labelled loops – Classes, Objects and Methods

UNIT III   **(Hours - 15)**
Arrays, Strings and vectors - Interfaces :Multiple Inheritance – Packages : Putting classes together – Multithreaded programming – Thread exceptions – Life cycle of Thread - Thread priority - Synchronization

UNIT IV   **(Hours - 15)**
Managing Errors and Exceptions – Types of Errors – Exceptions – Applet Programming – Applet life cycle – Graphics Programming

UNIT V   **(Hours - 15)**
Managing Input / Output Files in Java: Concepts of Streams – Stream classes – Byte stream classes – Character stream classes - Using streams – I/O classes – File classes - I/O Exceptions – Creation of files – Reading / Writing characters, Byte - Handling Primitive data types – Random Access Files.

Text Books
1. Grady Booch: "Object Oriented Analysis & Design with Applications", Second Edition, Pearson Education. 2000
2. E.BalaGurusamy: "Programming with Java", Third edition, Tata McGraw Hill Pvt Ltd.2011

Reference Books:

1. Patrick Naughton & Hebert Schildt: "The Complete Reference Java 2", Third edition, Tata McGraw Hill Pvt Ltd.2000
2. Programming with Java – John R.Hubbard, Second Edition, Tata McGraw 1999ata

SEMESTER – III
CORE 9: DATA COMMUNICATIONS AND NETWORKS

Subject Code: 16U3CACT09   **Total Hrs:90**   **No. of Credits: 4**
Objectives:
- To comprehend the use of different types of transmission media and network devices.
- To understand the concepts of flow control, error control and LAN protocols.
- To understand the functions performed by Network Management System.

UNIT I   **(Hours : 18)**
Introduction -Data communications – Networks – Network Types – Internet History – Standards and Administration – Network models : Protocol layering – TCP/IP Protocol Suite – OSI model.

UNIT II   **(Hours:18)**
PHYSICAL LAYER -Data and Signals – Periodic analog signals – Digital signals – Transmission Impairment – Data rate limits – Performance – Digital transmission : Digital to Digital Conversion – Analog to Digital conversion - Transmission modes - Analog transmission : Digital to analog conversion – Analog to Analog conversion .

UNIT III   **(Hours:18)**
DATA LINK LAYER-Error detection and correction : Block coding – Cyclic coding – Checksum – Forward error correction - Data Link Control (DLC) : DLC services – data link layer protocols – HDLC – Point to point Protocol(PPP) – Media Access Control(MAC) : Random Access – Controlled Access – Channelization.

UNIT IV   **(Hours:18)**
NETWORK LAYER-Network Layer services - Packet switching – Network layer performance – IPV Address – Forwarding of IP packets – Network layer protocols : Internet protocol (IP) – ICMPv4 – Mobile IP – Next generation IP :IPv6 Adressing – The IPv6 Protocol – The ICMPv6 Protocol – Transition from IPv4 to Ipv6.

UNIT V   **(Hours:18)**
TRANSPORT LAYER and APPLICATION LAYER-Transport layer protocols - User Datagram Protocol – Transmission Control Protocol – SCTP – Application Layer : Standard client server protocols : WWW and HTTP – FTP _ Electronic mail – Telnet – Secure Shell – Domain Name System – SNMP – ASN.1**.**
Text Book :
1. Behrouz A. Forouzan: "Data Communications and Networking", Fifth Edition, McGraw Hill Education pvt ltd.
Reference Books:
1. Achyut S Godbole: "Data Communications and Networks", Tata McGraw Hill Education pvt Ltd
2. Uyless d. Black: "Data Communications and Networks", Tata McGraw Hill Education Pvt Ltd

SEMESTER – III
CORE 10: JAVA PROGRAMMING PRACTICAL

Subject Code: 16U3CACP10   **Total Hrs: 90**   **No. of Credits: 3**

1. Write a Java Program to define a class, describe its constructor, overload the constructors and instantiate its object.

2. Write a Java Program to define a class, define instance methods for setting and retrieving values of instance variables and instantiate its object

3. Write a Java Program to define a class, define instance methods and overload them and use them for dynamic method invocation

4. Write a java program that illustrates the simple inheritance.

5. Write a java program that illustrates the multilevel inheritance.

6. Write a java program that describes the user defined exception.

7. Write a java program that illustrates the creation of threads by using runnable class

8. Write a java program that gives an example for this operator and the use of this keyword.

9. Write a java program that gives an example for super keyword.

10. Write a java program that gives demonstration of static variables and methods.

11. Write a java Program using applets to draw several shapes in the created windows.

12. Write a java program to create a banner using applet.

13. Write a java program to display an image using applet.

14. Write a java program to fill colors in shapes using applet.

15. Write a java program to create an event listener in applet.

SEMESTER : III
ALLIED 3 : OPERATIONS RESEARCH

Subject Code:16U3CAAT03   **Total Hrs: 75**   **No. of Credits: 4**

Objectives:
- To Know Operation Research and LPP, solving LPP
- To solve transportation and assignment problems
- To acquire knowledge of queuing theory, PERT and CPM

UNIT I   **(15 Hrs)**
Linear Programming-Mathematical Model assumption of Linear programming-Graphical Method-Simplex method- Big-m Method-Problems

UNIT II   **(15 Hrs)**
The Transportation Problems- Initial Basic Feasible Solution by North West Corner rule-Least Cost Method-Vogel's Approximation Method-The Assignment Problems-Assignment Algorithm-Optimum Solution-Unbalanced Assignment problem-Travelling Salesman Problem.

UNIT III   **(15 Hrs)**
Game Theory-Concept of pure and Mixed Strategies-Solving 2x2 matrix with and without saddle point- nx2-2xm games-Dominance Property.

UNIT IV   **(15 Hrs)**
(Derivations Not included) Queueing Theory- definition of waiting line model- Queue discipline-Traffic Intensity- Poison Arrival- Birth Deah process- Problems from single server: finite population model- Problems from multi server: finite population model.

UNIT V   **(15 Hrs)**
PERT and CPM- Network representation- Backward pass- forward pass- Computation- PERT network.

Text Book:

1. Resource Management Techniques- Prof. V. Sundaresan, K.S. Ganapathy Subramanian, K. Ganesan, Sixth Edition, A.R. Publications, Chennai.

Reference Books:

1. Operation Research- Kanti Swarup, P.K. Gupta and Man Mohan, Sultan Chand & sons, 13th Edition, New Delhi.
2. Operation Research- Prem Kumar Gupta D.S, Hira S, Chand & Company Ltd, Ram Nagar New Delhi.
3. Problems in Operation Research- P.K. Gupta and Man Mohan-11th Edition, Sultan Chand & Sons, New Delhi.

Unit I   : Chapter 2: Section: 2.1-2.5, Chapter 3: Section: 3.1.1-3.1.4, 3.2, 3.2.1
Unit II   : Chapter 7: Section: 7.1
                Chapter 8: Section: 8.1-8.9
Unit III   : Chapter 16: Section: 16.1-16.7
Unit IV   : Chapter 13: Section: 13.1- 13.6, 13.8
Unit V   : Chapter 15: Section: 15.1-15.7

SEMESTER – III
NON MAJOR ELECTIVE 1 : FOOD SCIENCE AND NUTRITION

Subject Code: 16U3NMET01   **Total Hrs: 30**   **No. of Credits: 2**

Objectives
1. To understand the importance of Nutrition and the role of food in health.
2. To know about the functions, deficiency and toxicity of nutrients.
3. To understand Malnutrition and its prevention
4. To know about various adulterants in food and the methods of detecting them.
5. To have an awareness on the prevailing food laws, hygiene and sanitation of foods.

UNIT 1   **Hours : 6**
Introduction to Nutrition: Terms used in Nutrition and Health. Definitions - Health, Nutrition, Nutrients, Foods, Diet, R.D.A., Balanced diet, Malnutrition, Under nutrition, Over nutrition, Optimum nutrition. Five Food Groups and Food guide, relationship between food and nutrition, functions of food, classification of nutrients, factors affecting food consumption and food acceptance. Elementary idea of probiotics, prebiotics and organic food.

UNIT 2   **Hours : 6**
Basic Nutrition: WATER- Functions, sources, requirements, water balance, dehydration (ORS) and toxicity. CARBOHYDRATE - Composition and classification, source, functions, requirements. LIPIDS- composition, sources, functions, requirements, deficiency and excess; fatty acids- essential and non-essential, SFA, USFA, MUFA, PUFA, significance of fatty acids, Rancidity. PROTEINS- composition, classification sources, functions, requirements, deficiency. ENERGY- unit of energy, food as a source of energy, definition of calorie and joules, energy requirement and factors affecting it- BMR, RMR, SDA.

UNIT 3   **Hours : 6**
VITAMINS- classification, sources, functions, requirements, deficiency and excess of the following: Vitamin A, D, E, K, C, Thiamin, Riboflavin, Niacin and B Complex. MINERALS - distribution in body, functions andsources, requirement, deficiency and excess of the following. Calcium, Phosphorus, Iron and Iodine. FIBRE- definition, types, sources, functions, importance in disease prevention.

UNIT 4   **Hours : 6**
Ecology of malnutrition- Definition, causes and consequences of malnutrition Ecological factors leading to malnutrition such as income, family size, dietary pattern, occupation, customs, food fads, fallacies and other factors. Measures to overcome malnutrition (only introduction)- Increased agricultural production through food technology, food fortification and enrichment, Nutrition education, Nutrition intervention programme genesis, objectives and operation of school lunch programme and ICDS, Organizations that combat malnutrition- International organization – FAO, WHO, UNICEF National Organizations – ICMR, NIN, CFTRI, DFRL, ICAR

UNIT 5   **Hours : 6**
Food Adulteration and Food Laws- Definition,Types, Common adulterants and home scale methods of detecting adulterants; Food Laws (only introduction) – PFA, BIS, AGMARK, FPO, HACCP. Food toxicants- Naturally occurring toxicants in canned foods, Alcoholic and non alcoholic beverages Sugars, preservatives, mushrooms Carcinogens in heated foods.

Text Book
Healthy Vittles and Bits- Dr.A.Indhuleka

Reference Books:
1. Guthrie Helen (1986) Introductory Nutrition. Times Mirror/ Mosby College Publishing.
2. Mudambi, S.R., Rajgopal, M.V.(1990) Fundamentals of Foods and Nutrition, NewAge International Pvt. Ltd.

SEMESTER III

SKILL BASED SUBJECT 1: MATHEMATICS FOR COMPETITIVE EXAMINATIONS –I

Subject Code: 16U3SBST01   **Total Hrs: 30**   **No. of Credits: 2**

Objectives:
- To understand the fundamental arithmetic skills and problem solving.
- To solve problem related to Ages and Calendar and Clocks.
- To develop the ability in solving Permutation , Combinations and Bankers Discount

UNIT I   **(6 HRS)**
Numbers – H.C.F and L.C.M of Numbers – Decimal Fractions – Simplification-Square Roots and Cube Roots – Average - Problems on Numbers

UNIT II   **(6 HRS)**
 Problems on Ages - Surds and Indices-Percentage-Races and games of skill – Calendar

UNIT III   **(6 HRS)**
Clocks – Stocks and shares - Profit and Loss – Ratio and Proportion

UNIT IV   **(6 HRS)**
Partnership – Chain Rule - Tme and Distance – Time and work

UNIT V   **(6 HRS)**
Permutation & Combinations - True Discount- Bankers Discount

(Simple Problems Only)

Text Book:
R. S. Agarwal : Quantitative Aptitude (for Competitive Examinations), S. Chand and Company Limited, 7th Revised Edition -2007.

Unit I	**:** Chapters 1 -7
Unit II	**:** Chapter 8- 10, 26 and 27
Unit III	**:** Chapters 28 and 29, 11 and 12
Unit IV	**:** Chapter 13 and 14 , 15 and 17
Unit V	**:** Chapter 30 - 33

Reference Books:
1. Hand Book On Mental Ability And Logical Reasoning prescribed by Bharathiar University.
2. R.V.Praveen: Quantitative Aptitude and Resoning, PHI Learning pvt. Ltd-2012.
3. Abhijit Guha : Quantitative Aptitude for Competitive Examinations, Tata Mc-Graw Hill Publishing Company, 7th reprint-2003.

SEMESTER-III
SKILL BASED SUBJECT 1: COMMUNICATION SKILLS- I

Subject Code:16U3SBST02   **Total Hrs: 30**   **No. of Credits: 2**

Objectives:

1.To enhance Listening, Speaking, Reading and Writing Skills among students.

2. To familiarise the students with the Sounds and Symbols used in English Language.

3. To emphasize the importance of Communication in the Global Scenario.

Unit –I- Communication

1. Verbal and Non-Verbal Communication
2. Barriers to Communication

Unit- II- Listening Skills

- Types of Listening
- Tips for Effective Listening
- Traits of Good Listening

Unit- III- Speaking

- Role Play
- Group Discussion
- Speaking at Different Types of Interviews
- Making Effective Telephone Calls
- Telephone Etiquette

Text Books:

1. Communication Skills by Meenakshi Raman (Oxford University Press)

2. Essential Communication Skills by Shalini Aggarwal (Ane Books Pvt.Ltd. New Delhi)

Reference Books:

1. Communication Skills a multi- skill course by Course team, Bharathiyar University(Macmillan)

2. Developing Communication Skills by Krishna Mohan(Macmillan)

3. Technical English – II by Joyce Pereire(Vijay Nicole Imprints Pvt.Ltd.)

mbggi lj;jkp;

gFjp; – IV :jkpojjhs; - 1 - %dwhk; gUtk;

(12-k; tFgG ti u jkp; nkhopgghlk; gapyhj tu;fS fF)

Subject Code: 16U3BTLT01   **Total Hrs: 20**

mfkjpgg! Lj; Nju;T kllk;

1. jkp; nkhopapd; mbggi lf; $Wfs;
2.
   vOj;Jffs;   : KjnyOj;Jffs; (capu; vOj;J> nka; vOj;J> capunka; vOj;J)
   nrhwfs;   : ti ffs; (ngaurnrhy> tpi drnrhy> , i lnrhy> cupnrhy)
   njhlu;   : njhlui kgG (vOtha> nraggLnghUs> gadpi y)
   3. FwggG vOJjy; : gj;Jg; gjpi deJ njhlufspy; FwggG ti ujy;
   gpi oefffp vOJjy; : (xwWggpi o> vOj;Jggpi o)

	mf kjpgg! Lj; Nju;T kjpngz; toqFk; Ki w	kjpngz; fs;
1	tFgGj Nju;T - 1	**10**
2	tFgGj Nju;T - 2	**10**
3	khjpupj Nju;T	**10**
4	gapwrpf; flLi u	**10**
5	thankhopj; Nju;T	**10**
	nkhjj kjpngz; fs;	**50**

FwggG : thankhopj; Nju;tpy; jkpr; nrknkhop tuyhW
njhlughd tpdhf;fs; kllNk Nfllggl Ntzllk;

SEMESTER – IV
CORE 11: WEB DESIGNING

Subject Code: 16U4CACT11   **Total Hrs:75**   **No. of Credits: 4**

Objectives:
- To get practiced with creating the schemas and XML Document.
- To acquire knowledge on creating web page to deploy the web applications.
- To understand scripting language in java & VB.

UNIT I   **(Hours - 15)**

   Internet : Introduction to the Internet – Internet Technologies-Browser-**HTML:** HTML command tags- Head and Body section – Tags with Automatic Line Breaks – Values – Designing web pages – Formatting Text in html – Text color – Ordered and Unordered Lists Creating Liks – Table Handlin – DHTML and Style sheets – frames.

UNIT II   **(Hours - 15)**

   Cascading Style sheets : Introduction to CSS – Creating Style Sheets- Commen Tasks with CSS - Colours – The Font Family – Assigning Classes – The Layer Tag – Css Tags

UNIT III   **(Hours - 15)**

   Extensive Markup Language (XML) : Introduction – Features of XML – Support and usage – Compatability of XML with others:-CSS and XSL-Xlinks and Xpointers-URLs Verurs URIs-XMl and SGML .

UNIT IV   **(Hours - 15)**

   Structure of a XML Documnets - Common Errors - Structure in XML:- well formed Xml Documents-Logical Structures-Physical structures-Mark-Up and Character data-White spaces-Xml Declaration-Tags and Elements-Tag Name-Creating Document Type Declaration.

UNIT V   **(Hours - 15)**

   Java Script: Introduction – operators – starting with Java Scripts – Statements in Javavscripts – Working with objects – properties – Browser objects – data objects – math objects – string objects – defining objects – Handling Events in JavaScripts – Event handling Attributes Window Events – Form Elements – User Actions – Frame Objects – Document Object -Document Objects – Navigation Objects – Screen objects – Images and Animation

TEXT BOOK :
1. C Xavier , "World Wide Web Design with HTML",Tata McGraw Hill Education Private Limited,New Delhi.2006.
2. Ramesh Bangia, "Web Technology (Including HTML, CSS,XML,ASP,JavaScript,VB Script), published by Firewall Media ,2008

REFERENCE BOOK :
1. L.Mathu Krithigha Venkatesh , " Web Technology",Margham Publications

SEMESTER – IV
Core 12 : SYSTEMS ANALYSIS AND DESIGN

Subject Code: 16U4CACT12   **Total Hrs:90**   **No. of Credits: 4**

Objectives :

- To understand inter compatibility and unity of purpose of sub-systems.
- To offer a means to create understanding of the complex structures.
- To understand and compare functional impacts of sub-systems to the total system.

UNIT I   **(Hours - 18)**

INTRODUCTION : The Systems Concept – Characteristics of a system – Elements of a system – Types of system – Physical or Abstract systems – Open or closed systems – Man made Information systems-A Dynamic Personnel Information System model. **The System development life cycle-** Considerations for candidate systems - Prototyping – Multifaceted role of the analyst – The Analyst/User Interface – The place of the Analyst in the MIS organization

UNIT II   **(Hours - 18)**

SYSTEM ANALYSIS : Bases for planning in systems analysis – Initial Investigation – Information gathering – Kind of information – Information gathering tools – types of interviews and Questionnaires. **Structured Analysis** – Tools- DFD-Data Dictionary-Decision tree and tables – Feasibility Study – Feasibility considerations – Steps in feasibility Analysis-Feasibility report – Cost and benefit Analysis-Procedure

UNIT III   **(Hours - 18)**

SYSTEM DESIGN : Process of Design – Design methodologies – Input/output and forms design – Input Design – Output Design – Forms – Types of forms – Layout considerations **File Structure** – File organization – Database Design – The Role of the Database Administrator

UNIT IV   **(Hours - 18)**

SYSTEM IMPLEMENTATION: System Testing and Quality Assurance- why System testing – What do we test for – The Test plan – Types of system tests – Quality Assurance : QA goals in the systems life cycle – Levels of QA – Trends in Testing. **Implementation** : Conversion -Activity network for conversion -Review Plan -Software Maintenance

UNIT V   **(Hours - 18)**

HARDWARE SOFTWARE SELECTION AND PROJECT SCHEDULING: The Computer Industry – The Software Industry – Procedure for selection- Project Management – Crisis elimination through planning – Project Organization. **System Security** – Threats to security – Control Measures - Disaster/Recovery planning**.**

Text Books:

1. Systems Analysis and Design - L Elias M.Awad – Second Edition – Galgotia Publications 2001

Reference Books :

1. System Analysis, Design, and Development: Concepts, Principles, and Practices Charles S.Wasson

2.Modern System Analysis and Design – Jeffery A.Hoffer 3rd Edition – Pearson Education 2002.

SEMESTER – IV
CORE 13 : E-Commerce

Subject Code : 16U4CACT13   **Total Hrs : 75**   **No of Credits : 3**

Objectives:
To enable students
- To have knowledge on concepts of e-Commerce.
- To enhance the knowledge in business strategy and inter organisational transactions.
- To understand the concepts of E-Markets, Electronic Data Interchange and E-Business.

UNIT – I   **(Hours - 15)**
      Introduction to E-Commerce : Electronic Commerce – The Scope of Electronic Commerce – Definition of Electronic Commerce - Electronic Commerce and the Trade Cycle - Electronic Markets - Electronic Data Interchange – Internet Commerce – e-Commerce in perspective. **Business Strategy in an Electronic Age**: The Value chain – Supply Chains Porter's Value Chain Model – Inter Organisational Value Chains.

UNIT – II   **(Hours - 15)**
      Business Strategy: Introduction to Business Strategy **–** Strategic Implications of IT – Technology – Business Environment – Business Capability – Existing Business Strategy – Strategy Formulation & Implementation Planning – e-Commerce Implementation – e-Commerce Evaluation. **Inter-organisational Transactions:** Inter-organisational Transactions – The Credit Transaction Trade Cycle – A Variety of Transactions.

UNIT – III   **(Hours - 15)**
      Electronic Markets: Markets - Electronic Markets – Usage of Electronic Markets – Advantages and Disadvantages of Electronic Markets. **Electronic Data Interchange:** Introduction to EDI – EDI Definition – The Benefits of EDI – EDI Example – EDI Agreement – EDI Security.

UNIT – IV   **(Hours - 15)**
      The Internet: The Internet – The Development of the Internet – TCP/IP – Internet Components – Uses of Internet. **A Page on the Web:** HTML Basics – Introduction to HTML – Further HTML – Client Side Scripting – Server Side Scripting – HTML Editors and Editing. **The Elements of E-Commerce** : Elements – e-Visibility – The e-Shop – Online Payments – Delivering Goods – Internet e-Commerce Security.

UNIT – V   **(Hours - 15)**
      Introduction to E-Wallet operation:What is an e-wallet-benifits of Wallet-risks-types of ewalet:paytm,MobiKwik,oxigenWallet,CitrusWallet,ItsCash,FreeCharge,AirtelMoney,Jiomoney,m Rupee,SBIBuddy,Vodaphone M-Pesa.Advantages and disadvantages of digital Wallet.

Text Book

1. e-Commerce Strategy, Technologies, and Applications – David Whitely, McGraw Hill Education (India) Edition 2001 32nd reprint 2013

Reference Book

1. E-Commerce E- Business – Dr C.S. Rayudu, Himalaya Publishing House, First Edition 2004, Reprint 2012
2. E-Commerce Concepts and Applications – Nidhi Dhawan, International Book House Pvt Ltd First Edition 2011
3. Electronic Commerce – Efrain Turban, David King, Pearson Education, 2009

SEMESTER – IV
CORE 14 : WEB DESIGINING PRACTICAL

Subject Code : 16U4CACP14   **Total Hrs : 90**   **No of Credits : 3**

LIST OF PRACTICAL PROGRAMS

HTML & CSS

1. Create Tables using colspan and rowspan

2. Linking using Image map

3. Embedding flash file in Html

4. Create web page in Html using frames

5. Apply effects to text and image using CSS

6. Change the font text color and background picture.

7. Changing the background color using onmouseover, on click, on change events.

8. Displaying the radio button and combo box elements in the text box

9. Moving text or image with mouse

10. Checking the shift key, Right mouse button, Left mouse button is pressed or not and finding X, Y co,ordinates.

11. Changing the background of the button in the tables using mouse over.

12. Displaying the text in the status bar

13. Movement of text of different boxes into single text box

14. Program For Personal Details using XML and DTD

15. Program For State Details using XML and CSS

16. Program For College Details using XLINK

SEMESTER-IV
ALLIED 4: BUSINESS ACCOUNTING

Subject code:16U4CAAT04   **Total Hours: 75**   **No of credits:4**

Objectives:
- To make the students understand the basic accounting concept and conventions.
- To enlighten the students on the importance of cost ascertainment reduction and control.
- To enable the students to understand the preparation of budgets in the business organizations.

UNIT –I   **(15 Hours)**
 Introduction – Accounting Principles – Braches of accounting – accounting rules - Journalising – Ledger – Subsidiary book including cash books – Trial balance

UNIT – II   **(15 Hours)**
 Preparation of Final accounts: Trading, Profit and Loss Account and Balance sheet with simpe adjustments – Outstanding Expenses and Income, Prepaid expenses, Pre received Income, Depreciation – Provision for bad debts

UNIT – III   **(15 Hours)**
 Cost Accounting: Meaning and elements of cost – Preparation of cost sheet with simple adjustments

UNIT – IV   **(15 Hours)**
 Cost Accounting: Meaing and Importance - Stores Ledger: FIFO – LIFO – Weighted average and Simple average method. Managemet Accounting: Its meaning and objectives – Difference between management accounting, financial accounting and cost accounting.

UNIT – V   **(15 Hours)**
 Budget and Budgetary control – Preparation of various budgets: Fexible budget – Production budget – Cash budget – Sales budget.

(Questions on problems and theory carry 80% and 20% of marks respectively)
Text Books:

1. T. S. Reddy & A. Murthy : Financial Accounting - Margham Publication, Chennai , 2016.
2. K.L. Nagarajan, N. Vinayakam, P.L. Nagarajan: Principles of Accountancy - S. Chand & Sons Company Limited, Reprint 2010.
3. N.P.Srinivasan & Sakthivel Murugan : Accounting for management - S. Chand & Company Limited, Reprint 2010.
4. T.S.Reddy & Y Hari Prasad Reddy : Cost Accounting – Margham publications, Reprint 2012
5. S.Reddy & Y Hari Prasad Reddy : Management Accounting– Margham publications, Reprint 2012

SEMESTER – IV
NON MAJOR ELECTIVE 2 : FLORICULTURE

Subject Code: 16U4NMET02   **Total Hrs: 30**   **No. of Credits: 2**

Objectives:

1. To learn about the cultivation of flowers and ornamental crops from the time of planting to the time of harvesting.
2. To focus on the promotional and awareness aspects by motivating them to grow traditional as well as non-traditional floral crops and houseplants for commercial purpose.
3. To learn the basics of growing and fertilizing plants and flowers.
4. To learn design techniques and work on dried and live bouquets, arrangements, corsages and boutonnières.

UNIT I   **Hours: 6**

Floriculture – Definition, Introduction and Scope of Floriculture. Status of floriculture in India.

Development of Floriculture

UNIT II   **Hours: 6**

Cut Flowers- Types of cut flowers, Arranging bouquets, Using floral design tools. Loose Flowers-Scope of loose flower trade, Significance in the domestic market/export,

UNIT III   **Hours: 6**

Design- Types of design Flower choice for design, Corsages/Boutonnières, Vase design, Basket/mug design.

UNIT IV   **Hours: 6**

Propagation-Types of propagation, Annuals & Perennials, Varieties, Growing seasons, Potting techniques.

UNIT V   **Hours: 6**

Careers in Floriculture. Export/Import and marketing in floriculture. Government Incentives and Schemes. The role of supporting agencies.

Text Book:

1. Introduction to Floriculture – Dr.S.N.Suresh

Reference Books:

1.Know your Garden Plants – Jacob Varghese Kunthara
2.Production Technology of Ornamental Crops and Landscape Gardening – Dr. B. Hemlanaik

SEMESTER IV

SKILL BASED SUBJECT 3 :MATHEMATICS FOR COMPETITIVE EXAMINATIONS -II

Subject Code: 16U4SBST03   **Total Hrs: 30**   **No. of Credits: 2**

Objectives:
- To make the students to know the concept of Probability and Problem on Trains.
- To solve problem related to Problems on Boats and Streams and Venn Diagram.
- To develop the skills in solving problems in Mental Ability and Logical reasoning.

UNIT I   **(6 HRS)**

　　　Pipes and cisterm – Probablity - Problems on trains

UNIT II   **(6 HRS)**
　　　Problems on Boats and Streams - Alligation or mixture

UNIT III   **(6 HRS)**
　　　Heights & Distance- Odd Man Out & Series - Simple Interes-Compound Interest -Logcal Venn Diagram

UNIT IV   **(6 HRS)**
　　　Logarithms – Sequence and series - Area-Volume and Surface areas

UNIT V   **(6 HRS)**
　　　Tabulation-Bar Graphs-Puzzles - Pie Charts-line Graphs- Mental Ability and Logical reasoning

(Simple Problems Only)

Text Book:
1.R. S. Agarwal : Quantitative Aptitude (for Competitive Examinations), S. Chand and Company Limited, 7th Revised Edition -2007.

Unit I   : Chapter 16 ,18 and 31
Unit II   : Chapter 19,20
Unit III   : Chapter 34 and 35, 21 and 22
Unit IV   : Chapter 23 - 25
Unit V   : Chapter 36 – 39

Reference Books:
1. Hand Book On Mental Ability And Logical Reasoning prescribed by Bharathiar University.
2.R.V.Praveen: Quantitative Aptitude and Resoning, PHI Learning pvt. Ltd-2012.
3. Abhijit Guha : Quantitative Aptitude for Competitive Examinations, Tata Mc-Graw Hill Publishing Company, 7th reprint-2003.

SEMESTER-IV
SKILL BASED SUBJECT 4 : COMMUNICATION SKILLS- II

Subject Code:16U4SBST04   **Total Hrs: 30**   **No. of Credits: 2**

Objectives:

1. To enhance Listening, Speaking, Reading and Writing Skills among Students.

2. To familiarise the students with the Sounds and Symbols used in English Language.

3. To emphasize the importance of Communication in the Global Scenario.

Unit-I : Reading & Writing

1. Reading Techniques (Skimming and Scanning)

2. Types of Reading -   Intensive Reading and Extensive Reading

3. Brain Storming

4. Resume Preparation

5. Report Writing

6. Minutes of a Meeting

7. Data Representation and Interpretation

8. Memos

Unit- II : Sounds & Symbols

1. Vowels

2. Consonants

3. Dipthongs

4. Stress and Intonation

Text Books:

- Communication Skills by Meenakshi Raman (Oxford University Press)
- Essential Communication Skills by Shalini Aggarwal (Ane Books Pvt.Ltd. New Delhi)

Reference Books:

- Communication Skills a multi- skill course by Course team, Bharathiyar University(Macmillan)
- Developing Communication Skills by Krishna Mohan(Macmillan)
- Techinical English – II by Joyce Pereire(Vijay Nicole Imprints Pvt.Ltd.)

mbggi lj;jkp;

gFjp; – IV :jkpojjhs; - 2 – ehdfhk; gUtk;

(12-k; tFgG ti u jkp; nkhopgghlk; gapyhj tu;fS fF)

Subject Code : 16U4BTLT02   **Total Hrs: 20**

mfkjpggl Lj;Nju;T klLk;

4. ellp E}yfs; : Mjjpr#b (Kjy; 12) "mwk; nra tpUkG" > Kjy; "xstpak; NgNry;" ti u.

5.
nfhdi w Ntejd; - "mdi dAk; ggjhTk; Kddwp njatk;" Kjy; "vz Zk; vOj;Jk; fz nz djjFk;" ti u (7)

jlUffFws; (5)   1. mfu Kjy… (1)
                     2. nrawfupa… (26)
                     3. kdj;Jf; fz ;… (34)
                     4. fwf frlwf;… (391)
                     ● vgnghUs; ahu; ahu;… (423)

vspa ellpf; fi jfs; - (njdhypuhkd; fi jfs> ggjghy; fi jfs> flhkpaf; fi jfs> <rhg; fi jfs)
jkp; , yffpaqfs; : tuyhW – FwgG – mwpKfk;
   vLj;Jffhll : Fws; gwwp vspa njhlu;fspy; mwpKfk;
   jkpofk; - cz TKi w> tphhf;fs> fi yfs; gwwpaf; FwgGfs;

	mf kjpggl Lj;Nju;T kjpgngz ; toqFk; Ki w	kjpgngz ;fs;
1	tFgGj Nju;T - 1	10
2	tFgGj Nju;T - 2	10
3	khjpupj Nju;T	10
4	gapwrpf; flLiu	10
5	thankhoj; Nju;T	10
	nkhjj kjpgngz ;fs;	50

**FwgG : thankhoj; Nju;tpy; jkpor; nrknkhop tuyhW
njhlughd tpdhf;fs; klLNk Nfl;fggl Ntz Lk;**

SEMESTER – V
CORE 15 : ASP . NET AND C#

Subject Code: 16U5CACT15   **Total Hours: 75**   **No of Credits: 4**

Objectives:

To enable the students
- To learn about the basic concepts of ASP .NET.
- To learn about the ASP .NET object model and its architecture.
- To learn about the C# and its functions.

Unit I   **(Hours - 15)**

Getting set up: ASP .NET? Setting up, environment, overview. Programming basics: basics, program flow, coding techniques, designing applications, dynamic website application, processing ASP .NET applications, visual basic .NET.

Unit II   **(Hours - 15)**

Programming ASP .NET with Visual Basic .NET Web Forms and ASP .NET: web forms. ASP .NET configuration, Scope and State: Configuration, state, Application object, ASP Sessions, Session object and sample project.

Unit III   **(Hours - 15)**

ASP .NET objects and components: scripting object model, components and controls, project example, more active components. Web services and ASP .NET: web service development, WSDL and SOAP, web services background. ASP .NET and SQL Server: using SQL server, using databases in ASP .NET, ActiveX data objects, ADO .NET object model, Coding SQL and Project.

Unit IV   **(Hours - 15)**

Understanding .NET: C# framework - .Net strategy, origins, framework, CLR, base classes, Visual Studio .Net, languages, benefits. Overview of C#: simple program, namespaces, main returning value, passing string objects, command line arguments, mathematical functions, compile time errors, structure. Literals, Variables and Data types.

Unit V   **(Hours - 15)**

Operators and Expressions, Decision making and branching, Decision making and looping, Handling Arrays.

Text Books:

2. ASP .NET – A Beginner's Guide, Dave Marcer, Third Edition, McGraw Hill Education India Private Limited
3. Programming in C# - A Primer, E. Balagurusamy, Third Edition, Tata McGraw Hill Pvt Ltd.

Reference Books

1. "Visual Basic .net programming Black book", Para Glyph Press, Third edition, 2009.
2. "Asp.Net Black Book", Dream Tech Press, Third edition, 2009.
3. Karli Watson, Christian Nagel, Jacob Hammer Pedersen, Jon Reid, and Morgan Skinner: "BEGINNING VISUAL C# 2010" by, Wiley Publishing, Inc.
4. Stephen C. Perry: "Core C# and .NET", Pearson Education,

SEMESTER-V
CORE 16 : RELATIONAL DATABASE MANAGEMENT SYSTEM

Subject Code: 16U5CACT16   Total Hrs: 75   No of Credits: 4

Objectives:

- To understand the concepts of RDBMS.
- To have knowledge on DBMS & RDBMS.
- To enhance their on SQL, DDL, DML, DCL Statements, Select, group by and having clause String and set operations, Aggregate Functions, Nested Sub Queries.
- To develop the skills of Embedded and Dynamic SQL.

UNIT I   (Hours - 15)

Database Concepts: A Relational approach: Database –Relationships –DBMS –Relational Data Model –Integrity Rules –Theoretical Relational Languages. Database Design: Data Modelling and Normalization: Data Modelling –Dependency –Database Design –Normal forms –Dependency Diagrams–De -normalization –Another Example of Normalization.

UNIT II   (Hours - 15)

Oracle9i: Overview: Personal Databases –Client/Server Databases –Oracle9i an introduction –SQL *Plus Environment –SQL –Logging into SQL *Plus -SQL *Plus Commands - SQL *Plus Worksheet.Oracle Tables: DDL: Naming Rules and conventions –Data Types –Constraints –Creating Oracle Table –Displaying Table Information –Altering an Existing Table –Dropping, Renaming, Truncating Table –Table Types.

UNIT III   (Hours - 15)

Working with Table: Data Management and Retrieval: DML –adding a new Row/Record –Customized Prompts Updating and Deleting an Existing Rows/Records –retrieving Data from Table –Arithmetic Operations –restricting Data with WHERE clause –Sorting –Revisiting Substitution Variables –DEFINE command –CASE structure.

UNIT IV: (Hours - 15)

Functions and Grouping: Built-in functions –Grouping Data. Multiple Tables: Joins and Set operations: Join –Set operations.

PL/SQL: A Programming Language: History –Fundamentals –Block Structure –Comments –Data Types –Other Data Types –Declaration –Assignment operation –Substitution Variables –Arithmetic operators.

UNIT V   (Hours - 15)

Control Structures and Embedded SQL: Control Structures –Nested Blocks –SQL in PL/SQL –Data Manipulation.PL/SQL Cursors and Exceptions: Cursors –Implicit & Explicit Cursors and Attributes–Cursor FOR loops –SELECT...FOR UPDATE –WHERE CURRENT OF clause –Cursor with Parameters –Cursor Variables.

Text Book

1. Database Systems using Oracle, Nilesh Shah, 2nd edition, PHI,2004.

Reference Books

1. Database Management Systems, Majumdar & Bhattacharya, 2007, TMH.
2. Database Management Systems, Gerald V. Post, 3rd edition, TMH.
3. Relational Database Management Systems, Mrs. Vidya H. Bankar, Mrs. Deepashree K. Mehendale, Mrs. Sujata P. Patil,Personal Educations.
4. Oracle pl/sql programming,o'reilly, 5rd edition.
5. Computer Fundamentals and RDBMS ,by smita vaze,subhalaxmi joshi, Published January 1st   2010 by Himalaya Pub.

SEMESTER-V
CORE 17 : ASP . NET AND C# PROGRAMMING PRACTICAL

Subject Code: 16U5CACP17   **Total Hrs: 90**   **No of Credits: 4**

1. Write a C# program to allocate dynamic arrays.

2. Write a C# program for converting numbers into words.

3. Write a C# program for arithmetic operations – addition, subtraction, multiplication and division using Switch case statement.

4. Write a C# program to check whether given string is a palindrome or not.

5. Write a C# program to read number and check ODD or EVEN.

6. Write a C# program that prints out Fibonacci Series.

7. Write a C# program to convert from Fahrenheit to Celsius and Celsius to Fahrenheit.

8. Write a C# program to check whether the given year is a leap year or not.

9. Write a ASP .NET program to display date and time.

10. Write a ASP .NET program to perform arithmetic operation.

11. Write a ASP .NET program to convert decimal number to binary, octal and hexadecimal.

12. Write a ASP .NET program to develop a simple calculator.

13. Write a ASP .NET program to demonstrate the text control.

14. Write a ASP .NET program to demonstrate the checkbox control.

15. Write a ASP .NET program to design simple registration form using asp .net objects.

SEMESTER-V
CORE 18 : WEB TECHNOLOGY PRACTICAL

Subject Code: 16U4CACP18   **Total Hrs: 90**   **No of Credits: 3**

LIST OF PRACTICAL PROGRAMS

1.Create a VB .Net program to add a string to Combo box with value of Textbox when user clicks button control.

2.Create a VB .Net program to display hierarchical representations of items with tree view control using Runtime coding.

3.Create a VB .Net program to handle user defined Exceptions.

4.Create a VB .Net program for Employee details to read and display the data using constructors and member functions.

5.Create an application in VB .Net to demonstrate the following events:

i.Click

ii.Mouse Down

iii.Key Down

iv.Form Load

6.Create an application in VB.Net for File Menu with Menu items New, Open, Save, Print and Exit & Edit Menu with Menu items Cut, Copy, Paste, Find and Undo.

7.Create an application in VB .Net for student information database and perform the following operations:

i.Addition

ii.Deletion

iii.Updation

8.Design a website using web form to show the current date and time when a user clicks the button.

9.Using Java Script's Window and document objects and their properties and various methods like alert (), evaI (), Parselnt () etc. methods to give the dynamic functionality to HTML web pages.

10.Writing Java Script snippet which make use of Java Script's inbulit as well as user defined objects like navigator, Date Array, Event, Number etc.

11.Write code which does the form validation in various INPUT elements like Text Filed, Text Area, Password, Selection list etc.

12.Writing XML web Documents which make use of XML Declaration, Element Declaration, Attribute Declaration.

SEMESTER-V
NON CREDIT COURSE : APTITUDE & SOFT SKILLS- I

Subject Code: 16U5NCCT01   **Total Hrs: 45**

Objectives:

1.To develop Positive attitude among students by mastering Soft Skills.

2.To enable the students to face the personal Interviews Successfully.

Unit I: Soft Skills

1.   Empathy

2.   Intrapersonal Skills

3. Interpersonal Intelligence

4. Problem Solving Skills

5. Critical Thinking

6. Aptitude and Assessment Test

Unit II: Aptitude

1.Numerical Reasoning

2. Mental Ability

3.Logical Reasoning

Text Books:

1.Techinical English – I by Prof .N. Lakshmana Perumal (Sri Krishna Hitech Publishing Company Pvt. Ltd.)

2.Quantitative Aptitude for Competitive Examinations, Revised 2017 EDITION by R. S. Aggarwal (English, Paperback).

Reference Book:

1. Techinical English – II by Joyce Pereire(Vijay Nicole Imprints Pvt.Ltd.)

SEMESTER – VI
CORE 19: SOFTWARE TESTING

Subject Code : 16U6CACT19   **Total Hrs : 75**   **No of Credits : 4**

Objectives:
   To enable students
   - To have knowledge on software testing concepts.
   - To enhance the knowledge in the concepts and principles of software development life cycle model and various testing concepts.
   - To judge the quality of software's.

UNIT – I   **(Hours - 15)**
   Software Developments Life Cycle models : Phases of software project – Quality, Quality Assurance, Quality Control – Testing, Verification and Validation – Process Model to represent different Phases – Life Cycle models. **White Box Testing:** Static Testing – Structural Testing – Challenges in White Box Testing

UNIT – II   **(Hours - 15)**
   Black Box Testing: What is Black Box Testing? – Why Black Box Testing? – When to do Black Box Testing? – How to do Black Box Testing? . **Integration Testing:** What is Integration Testing? - Integration Testing as a type of Testing - Integration Testing as a Phase of Testing – Scenario Testing – Defect Bash.

UNIT – III   **(Hours - 15)**
   System and Acceptance Testing: System Testing Overview – Why is System Testing done? – Functional versus Non-Functional Testing – Functional System Testing – Non-Functional Testing – Acceptance Testing – Summary of Testing Phases.

UNIT – IV   **(Hours - 15)**
   Performance Testing: Factors Governing Performance Testing – Methodology of Performance Testing – Tools for Performance Testing – Process for Performance Testing – Challenges. **Regression Testing:** What is Regression Testing – Types of Regression Testing – When to do Regression Testing – How to do Regression Testing – Best Practices in Regression Testing.

UNIT – V   **(Hours - 15)**
   Test Management and Automation: Test Planning, Management, Execution and Reporting: Test Planning – Test Management – Test Process – Test Reporting – Best Practices. **Test Metrics and Measurement**: What are Metrics and Measurement? – Why Metrics in Testing – Types of Metrics – Project Metrics – Progress Metrics – Productivity Metrics – Release Metrics.

Text Book
1. Software Testing Principles and Practices – Srinivasan Desikan & Gopalsamy Ramesh, 2006 Pearson Education (Twentieth – First Impression, 2014

Reference Book
2. Effective Methods of Software Testing – William E.Perry, 3rd Edition. 2008
   Software Testing – Renu Rajani, Pradeep Oak, 2007 TATA McGraw Hill Education, 2006.

SEMESTER – VI
CORE 20 : SOFTWARE TESTING PRACTICAL

Subject Code: 16U6CACP20   **Total Hrs:75**   **No. of Credits: 3**

1. Performing a test in the Apache JMeter Testing Tool to implement the factorial concepts.

2. Performing a test in the Apache JMeter Testing Tool to analyze the suitable problem and displaying the results.

3. Performing a test in the Apache JMeter Testing Tool to find the fibonaaci series.

4. Creating test cases and testing the functionality of calculator.

5. Creating test cases and testing the java Program which generates sum of a individual digit of a 5-digit number until a single digit is produced.

6. Testing the java program: Sort and store the elements two arrays of integers into the third list.

7. Testing the java program: multiple inheritance.

8. Testing the java Program: Palindrome string checking program.

9. Testing the java Program: String Manipulation.

10. Testing the java Program: Employee details using constructors.

SEMESTER – VI
CORE 21 : PHP AND MY SQL-PRACTICAL

Subject Code: 16U6CACP21   **Total Hrs: 90**   **No. of Credits: 3**

1. Write a program to create different variables.

2. Develop a PHP program using controls and functions

3. Develop a PHP program to design a college application form using MYSQL table.

4. Write a program to send an HTML formatted Email in PHP.

5. Develop a PHP program to display student information using MYSQL table.

6. Write a program to do different types of Sorting in PHP.

7. Write a program to do String Manipulation in PHP.

8. Write a PHP program to get color code from the user which displays the color name.

9. Write a PHP program to do calculator functions

10. Write a program to upload a file in PHP.

11. Write a program for login authentication using PHP and MySQL

12. Create a Pay slip for an employee using PHP and MySQL

13. Write a program to demonstrate how a web page can communicate with a web server while a user type characters in an input field

14. Develop a PHP program using session

15. Develop a PHP program using cookie and session

SEMESTER – VI
CORE 22: PROJECT AND VIVA VOCE

Subject Code: 16U6CACV22   **Total Hrs: 90**   **No. of Credits: 4**

GUIDELINES FOR PROJECT WORK

- The aim of the project work is to acquire practical knowledge on the implementation of the programming concepts studied.

- Each student should carry out individually one project work and it may be a work using the software packages that they have learned or the implementation of concepts from the papers studied or implementation of any innovative idea focusing on application oriented concepts.

- The project work should be compulsorily done in the college only under the supervision of the department staff concerned.

FINAL VIVA VOCE

- Project work carries 100 marks with 4 credits

- Internal Assessment: 80 marks (60 marks for 3 reviews and 20 marks for record) and External Assessment : 20 marks (Viva Voce)

- For awarding a pass, a candidate should have obtained 40% of the total 100 Marks.

- The evaluation would be done jointly by both the examiners (Internal and External). Students who fail in the project work and viva-voce examination or who are absent for the project viva-voce who fail to submit the project report before the due date will have to re-submit the project work and appear for the viva-voce examination during the subsequent year.

<u>**PROJECT WORK**</u>

TITLE OF THE DISSERTATION

Bonafide Work Done by

STUDENT NAME
REG. NO.

Dissertation submitted in partial fulfillment of the requirements
for the award of Bachelor of Computer Applications of
Bharathiar University, Coimbatore-46

College Emblem

GUIDE   HOD

Submitted for the Viva-Voce Examination held on _____

Internal Examiner   External
Examiner

MONTH – YEAR

CONTENTS

ACKNOWLDGEMENT

CONTENTS

SYNOPSIS

1. INTRODUCTION

 1.1 ORGANIZATION PROFILE

 1.2 SYSTEM SPECIFICATION

 1.2.1 HARDWARE CONFIGURATION

 1.2.2 SOFTWARE SPECIFICATION

2. SYSTEM STUDY

 2.1 EXISTING SYSTEM

 2.1.1 DRAWBACKS

 2.2 PROPOSED SYSTEM

 2.2.1 FEATURES

3. SYSTEM DESIGN AND DEVELOPMENT

 3.1 FILE DESIGN

 3.2 INPUT DESIGN

 3.3 OUTPUT DESIGN

 3.4 DATABASE DESIGN

 3.5 SYSTEM DEVELOPMENT

 3.5.1 DESCRIPTION OF MODULES

        (Detailed explanation about the project work)

4. TESTING AND IMPLEMENTATION

5. CONCLUSION

 BIBLIOGRAPHY

 APPENDICES

 A. DATA FLOW DIAGRAM

 B. TABLE STRUCTURE

 C. SAMPLE CODING

 D. SAMPLE INPUT

 E. SAMPLE OUTPUT

SEMESTER-VI
NON CREDIT COURSE : APTITUDE & SOFT SKILLS - II

Subject Code: 16U6NCCT02   **Total Hrs: 45**

Objectives:

1. To develop Positive attitude among students by mastering Soft Skills.

2. To enable the students to face the personal Interviews Successfully.

Unit I: E- Materials

Interactive Exercises for Grammar and Vocabulary

Audio/Video Excerpts of different Accents

Interpreting Posters

Unit II: Aptitude

1. Numerical Reasoning

2. Mental Ability

3. Logical Reasoning

Text Books:

1. Techinical English – I by Prof .N. Lakshmana Perumal (Sri Krishna Hitech Publishing Company Pvt. Ltd.)

2. Quantitative Aptitude for Competitive Examinations, Revised 2017 EDITION by R. S. Aggarwal (English, Paperback).

Reference Book:

1. Techinical English – II by Joyce Pereire(Vijay Nicole Imprints Pvt.Ltd.)

SEMESTER – V
Elective 1: SOFTWARE ENGINEERING

Subject Code: 16U5CAET1A   **Total Hrs:60**   **No. of Credits: 3**

Objectives:

To enable the students
- To provide knowledge on Software engineering concepts
- To understand various techniques of cost estimation of software , software design and software Requirements.
- To understand various issues in implementation of software , verification , validation and maintenance of software to give a roadmap to design a new software project.

UNIT –I   **(Hours – 12)**

Introduction to Software Engineering : Introduction-Basic definitions- Distribution of effort- Project Size Categories – Managerial Issues -Quality and Productivity Factors – Software Cost Factors. **Planning a Software Project:** Introduction – Software life Cycle Models – Waterfall Model – Work Products and Reviews – Prototype Model – Spiral Model – Concurrent Development Model – Component Assembly Model – Rapid Application Development Model – The incremental Model – Planning an Organizational Structure.

UNIT –II   **(Hours – 12)**

Software Cost Estimation: Introduction- Software Cost Estimation Techniques – Staffing Level Estimation – Software Maintenance Cost Estimation. **Software Requirements Analysis:** Software Requirements Analysis – Facilitated Application Specification Technique – Quality Function Deployment – Elements of Requirements Analysis- Classical Analysis Methods.

UNIT –III   **(Hours – 12)**

Software requirements Definition: Software Requirements Specification- Formal Specification Techniques – Languages and Processors for SRS**. Software Design:** Introduction – Types of Design – Design Strategies – Fundamental Design Concepts – Modules and Modularization Criteria – Design Notations – Design Techniques – Distributed and Real Time System Design.

UNIT –IV   **(Hours – 12)**

Source Code Development : Introduction – Structured Programming Techniques – Coding Style – Documentation Guidelines. **Verification and Validation :** Introduction – Software Quality – Verification and Validation Methods – Software Quality Assurance – Formal Technical review- Structured Walkthrough – Inspection – Audit – Testing – Testing Strategies – Debugging – Source Code Metrics- Static Analysis – Symbolic Execution – Formal Verification.

UNIT –V   **(Hours – 12)**

      Software Testing Methods: Flow graph and Graph Matrix- Software Testing Methods – White box testing – White Box Testing Techniques – Black box Testing - Black box Testing Techniques – Characteristics of testable software.

Software maintenance and Configuration management: Introduction: Managerial Aspects of software maintenance – Enhancing Maintainability during development – Software Configuration management. **Advanced Topics in Software Engineering:** Software Reliability techniques- Risk management – Total Quality movement – Capability maturity model integration – Clean room Software Engineering – Software Reengineering- Reverse Engineering.

Text Book

 1. " Software Engineering", A.K.R.S. Anusha, Charulatha Publications, december 2016.

Reference Books

1.Software Engineering: A Practitioner's Approach (India) Paperback – Import, 1 Jun 2004 by Pressman .

SEMESTER – V
ELECTIVE 1: DATA MINING

Subject Code:16U5CAET1B   **Total Hrs:60**   **No. of Credits: 3**

Objectives:

To enable the students
- To know the basics of data mining and warehousing.
- To Understand various techniques in data mining.
- To learn about architecture of data warehouse and its applications

UNIT I   **(Hours- 12)**

     Introduction – Data mining – Data mining functionalities – kinds of patterns can be mined – classification – major issues. Data warehouse – A multidimensional data model – Data warehouse architecture – Data warehouse implementation – From data warehouse to data mining.

UNIT II   **(Hours- 11)**

     Data pre-processing – Data cleaning – Data Integration and Transformation – Data Reduction – Discretization and concept hierarchy generation – Data mining primitives – Data mining Task.

UNIT III   **(Hours- 13)**

     Association Rule Mining – Mining single dimensional Boolean association rules from transactional databases –. Classification and prediction – Issues regarding classification and prediction – Bayesian classification- Classification by Back propagation – classification based on concepts from association rule mining.

UNIT IV   **(Hours- 12)**

     Cluster Analysis – A categorization of Major clustering methods - Partitioning methods- Hierarchical methods – Grid based methods -Model based clustering methods – Density – based methods.

UNIT V   **(Hours- 12)**

     Applications and Trends in Data Mining – Data mining system products and Research prototypes – Additional themes on Data mining – Social Impacts of Data Mining – Trends in Data mining-Mining Spatial Databases – Mining Time - series and sequence data – Mining the World wide web.

Text Books:
1. Jiwei Han, Michelien Kamber, Data Mining Concepts and Techniques, Morgan Kaufmann Publishers an Imprint of Elsevier, Latest Edition 2003.
2. Arun K.Pujari, Data Mining Techniques, Universities Press (India) Limited,

Reference Books

1. George M. Marakas, Modern Data warehousing, Mining and Visualization: Core Concepts, Printice Hall, First Edition, 2002.
2. Pang-Ning Tan, Michael Steinbach, Vipin Kumar, Introduction to Data Mining, Pearson, 2008.
3. Soman K. P, Shyam Diwakar, V. Ajay, Data Mining, Printice Hall, 2008.

SEMESTER – V
ELECTIVE 1 : COMPUTER GRAPHICS

Subject Code: 16U5CAET1C   **Total Hrs: 60**   **No. of Credits: 3**

Objectives:
- To provide knowledge to the students on the basic concepts of computer graphics.
- To gain knowledge 2D and 3D display methods.
- To learn the concepts of multimedia hardware and software

UNIT I   **(Hours- 12)**
Output Primitives: Points and Lines – Line-Drawing algorithms – Loading frame Buffer – Line function – Circle-Generating algorithms – Ellipse-generating algorithms.
Attributes of Output Primitives: Line Attributes – Curve attributes – Color and Grayscale Levels – Area-fill attributes – Character Attributes.

UNIT II   **(Hours- 12)**
Overview of Graphics System - Bresenham technique - Line Drawing and Circle Drawing Algorithms- DDA - Line Clipping - Text Clipping.

UNIT III   **(Hours- 12)**
2Dimensional: 2D Geometric Transformations: Basic Transformations –Matrix Representations –Composite Transformations. **2D Viewing:** The Viewing Pipeline –Viewing Co-ordinate Reference Frame –Window-to-Viewport Co-ordinate Transformation -2D Viewing Functions –Clipping Operations.

UNIT IV   **(Hours- 12)**
3Dimensional: 3D Display methods: Parallel Projection - Perspective Projection . **3D Graphics:** Bezier Curves and Surfaces. **3D Viewing:** The Viewing Pipeline- Coordinates- 3D Viewng Functions. **Visible Surface Detection Methods.**

UNIT V   **(Hours- 12)**
Surface – Rendering methods: Polygon rendering methods- **Adding surface details** - **Color models** – XYZ-RGB-YIQ- CMY-HSV Models. - **Computer Animation.**

Text Books
1. Donald Hearn and M. Pauline Baker, "Computer Graphics" , Prentice Hall of India,2007, 2nd Edition.
2. Ralf Steinmetz, Klara steinmetz, "Multimedia Computing, Communications and Applications", Pearson education, 2004

Reference Books
1.Steven Harringhton, "Computer Graphics Programming Approach ", McGraw Hill, 2nd Edition.
    2.W.M.Newman and Sproull. "Principles of interactive Computer Graphics" ,TMH

SEMESTER – V
ELECTIVE 2: EMBEDDED SYSTEMS

Subject Code: 16U5CAET2A   **Total Hrs:60**   **No. of Credits: 3**

Objective:
- To make the students to have basic Knowledge and understanding of fundamental embedded systems design paradigms, architectures, possibilities and challenges, both with respect to software and hardware
- Ability to analyze a system both as a whole and in parts and their interaction in the functionality and properties of the system.
- To make the students to have a clear understanding on industrial embedded systems and intelligent embedded system development.

UNIT-1   **(Hours – 12)**
       Introduction To Embedded System: Embedded System - Processor Embedded Into a System - Embedded Hardware Units And Devices In a System - Embedded Software In a System - Examples Of Embedded System - Embedded System-On-Chip(Soc)And Use Of VLSI Circuit Design Technology. Memory Organization: Processor And Memory Organization – Memory Types - Memory Maps And Address – Processor Selection - Memory Selection.

UNIT-2   **(Hours – 12)**
       Devices And Communication Buses For Devices Network: IO Types And Examples - Serial Communication Devices - Parallel Device Ports - Sophisticated Interfacing Features In Device Ports - Wireless Devices - Timer And Couting Devices - ISR Concept - Interrupt Sources - Interrupt Servicing(Handling)Mechanism - Multiple Interrupt.

UNIT-3   **(Hours – 12)**
       Programming Concept And Embedded Programming In C, C++ & Java: Software Programming In Assembly Language(Alp) and In High Level Language 'c' – C Program Element: Header and Source File And Pre-processor Directives - Program Elements: Macro And Functions -program Elements : Data Types, Data Structures, Modifiers, Statements, Loops And Pointers - Object - Oriented Programming - Embedded Programming In C++ - Embedded Programming In Java.

UNIT-4   **(Hours – 12)**
       Inter Process Communication And Synchronization Of Process, Threads And Tasks: Multiple Processes In An Application - Multiple Threads In An Application – Tasks - Inter Process Communication - Message Queue Function - Mailbox Function - Pipe Function - Socket Function – RPC Function.

UNIT-5   **(Hours – 12)**
       Real Time Operating System: OS Services - Process Management - Timer Function - Event Function - Memory Management – Devhjhices, Files and IO Sub System Management - Interrupt Routines RTOS Environment And Handling Of Interrupt Source Calls - Real-Time

Operating System -Basic Design Using An RTOS - RTOS Task Scheduling Models, Interrupt Latency And Response Of The Task As Performance Metrics.

Text Books

1. Embedded Systems – Architecture , Programming and Design – Raj Kamal - 2 nd edition 2007.

Reference Books

1. Embedded Systems – Architecture , Programming and Design – Raj Kamal TATA McGRAW-HILL EDITION, New Delhi.

SEMESTER – V
ELECTIVE 2: CLIENT SERVER TECHNOLOGY

Subject Code: 16U5CAET2B   **Total Hrs : 60**   **No. of Credits : 3**

Objectives

To enable the students
- To understand the concepts of client/server
- To learn the components of client and server application
- To learn the components of client and server application-Connectivity
- To learn the components of client and server application-Software & Hardware

UNIT-I   **(Hours - 12)**

Client/Server Computing :Mainframe -Centric Client/Server Computing-Downsizing and Client/Server Computing .Advantages of Client / Server Computing -Connectivity –Ways to improve Performance –How to reduce network Traffic

UNIT-II   **(Hours-12)**

Components of Client/Server Applications –The Client: Role of a Client –Client Services – Request for Service-RPC. Components of Client/Server Applications –The Server: The Role of a Server –Server Functionality in Detail –The Server Operating system.

UNIT-III   **(Hours - 12)**

Components of Client/Server Applications –Connectivity: Open System Interconnect – Communications Interface Technology – Inter process communication –WAN Technologies.

UNIT-IV   **(Hours - 12)**

Components of Client/Server Applications–Software: Factors Driving demand for application software development –Rising Technology Staff costs –Need to improve Technology –Need for Common Interface across Platforms –Client/Server System Development Methodology-OOP.

UNIT-V   **(Hours - 12)**

Components of Client/Server Applications–Hardware: Hardware/Network Acquisition –PC-Level Processing Units –Macintosh, notebooks, Pen –UNIX Workstation –x-terminals –Disk, Tape, Optical Disks, NIC and UPS. The Future of Client/Server Computing: Enabling Technologies –Transformational Systems.

Text Books

1. Client /Server Computing, Patrick N.Smith with Steve L.Guengerich, 2nd edition, PHI,2012.

Reference Books

1. Robert Orfali, Dan Harkey, Jeri Edwards: The Essential Client/Server Survival Guide, 3rd edition, WileyIndia, 2011.
2. Client/ Server Computing, Dewire and Dawanatravis, 1st edition,Tata Mcgraw Hill Pub,2008.

SEMESTER - V
ELECTIVE 2: WEB TECHNOLOGY AND ITS APPLICATIONS

Subject Code: 16U5CAET2C   **Total Hrs: 60**   **No. Of Credits: 3**

Objectives:
- To understand the concepts Web Technology.
- To have knowledge on Web Designing Concepts.
- To enhance their designing skills on various .NET platforms.
- To develop the skills on VB.Net, Java Script, XML.
- To inculcate the knowledge on web technological concepts and functioning of internet.

UNIT I   **(Hours - 10)**

Networking Protocols and OSI Model: OSI Model, Layer functions. Internetworking concepts, devices, internet basics: why internetworking, problems, virtual network, repeaters, bridges, routers, gateways, history of internet, growth.

UNIT II   **(Hours - 12)**

TCP/IP Part I: basics, addressing, IP addressing, logical addresses, concept of IP address, ARP, RARP, BOOTP, DHCP, ICMP. TCP / IP Part II: TCP, UDP – basics, features, relationship, ports and sockets, connections, TCP segment format, UDP, differences.

UNIT III   **(Hours - 12)**

DNS, Email, FTP, TFTP – DNS, Email, FTP, TFTP. TCP / IP Part IV : WWW, HTTP, TELNET – history, basics, HTML, common gateway interface, remote login (TELNET).

UNIT IV   **(Hours - 13)**

Java Script and AJAX. PHP / MySQL – scripting language, client side vs Server side, Features of PHP, reference, MySQL basics, using MySQL with PHP.ASP.NET: overview of .NET framework, Details, Server controls and web controls, validation controls.

UNIT V   **(Hours - 13)**

Java Web Technologies – Java servlets and JSP, Creating and testing, servlet, session management, introduction to JSP, JSP and JDBC, EJB, architecture, overview, types of EJB, session beans. Web Security: principles, cryptography, plain text and cipher text, digital certificates, signatures, secure socket layer. XML – what is XML? XML versus HTML, EDI, Terminology, Document-Type Declaration, Element-Type declarations.

Text Books
1. Web Technologies TCP/IP to Internet Applications Architectures –Achyut S Godbole & Atul Kahate, 2007, TMH.
Reference Books
1. Internet and Web Technologies –Rajkamal, TMH Publications 2002.
2. TCP/IP Protocol Suite –Behrouz A. Forouzan, 3rd edition, TMH Publications,2010

.SEMESTER-VI
ELECTIVE 3 : ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEM

Subject Code: 16U6CAET3A   **Total Hrs: 60**   **No. Of Credits: 3**

Objectives:

- To understand the expert-level knowledge about a particular domain and knows how to use its knowledge to respond properly.
- To understand the area of domain within which the task is being performed.
- To understand the source of knowledge may come from a human expert and/or from books, magazines and internet.
- To understand the functioning of expert systems and knowledge-based systems.

UNIT – I   **(Hours - 12)**

Artificial Intelligence : Intelligence, AI Concepts, Various definitions of AI, Knowledge, Knowledge Pyramid, People and Computers: What computers can do better that people, what people can do better than computers; Characteristics of AI Problems, Problem Representation in AI, Components of AI, AI Evolution, Application Areas of AI, History of AI, The Turing Test, The Revised Turing Test.

UNIT – II   **(Hours - 12)**

Expert System: Components of Expert System: Knowledge Base, Inference Engine, User Interface, Features of Expert System, Expert System Life Cycle, Categories of Expert System, Rule Based vs. Model Based Expert Systems, Advantages/Limitations of Expert System.

UNIT – III   **(Hours - 12)**

Developing an Expert System: Identification, Conceptualization, Formalization, Implementation, Testing, Using an Expert System, Application Areas of Expert System.

UNIT – IV   **(Hours - 12)**

AI and Search Process: Brute Force Search –Depth First/Breadth First Search, Heuristic Search: Hill Climbing, Constraint Satisfaction, Mean End Analysis, Best First Search, A* Algorithm, AO*Algorithm, Beam Search.

UNIT–V   **(Hours - 12)**

Natural Language Processing: Introduction, Need, Goal, Fundamental Problems in Natural Language Understanding, How People overcome Natural Language Problems.
Speech Recognition: Introduction,Advantages and Approaches, Introduction to Robotics: Parts of a Robot, Controlling a Robot,Intelligent Robots, Mobile Robots.

Text Books

1.Henry C.Mishkoff, "Understanding Artificial Intelligence S. Janakiraman, "Foundation of Artificial Intelligence and Expert Systems",2004.

Reference Books

1. Artificial Intelligence : A Modern Approach – Stuart Russell, Peter Norvig 3rd Edition 2015 Pearson Education
2. Introduction to Artificial Intelligence – Akerkar Rajendra – PHI Learning Pvt Ltd
3. Artificial Intelligence and Machine Learning – Anand Hareendran, Vinod Chandra – PHI Learning 2014

SEMESTER – VI
ELECTIVE 3 : MOBILE COMPUTING

Subject Code: 16U6CAET3B   **Total Hrs:60**   **No. of Credits: 3**

Objectives:
- To introduce the mobile communication fundamentals.
- To enable the students to write android based script for application development.
- To make the students learn and understand eclipsed based IDE programming for the mobile environment.

UNIT I   **(Hours - 12)**

    Introduction: Mobility of Bits and Bytes –Wireless The Beginning – Mobile Computing – Dialogue Control – Networks – Middleware and Gateways – Application and services- Developing Mobile computer Applications – security in mobile computing – Standards - Why is it necessary – Standard bodies. MOBILE COMPUTTING ARCHITECTURE: History of computers and Internet – Architecture for mobile computing – Three-tier architecture – Design considerations for mobile computing – Mobile computing through Internet – Making exiting applications mobile enabled

UNIT II   **(Hours - 12)**

    MOBILE COMPUTING THROUGH TELEPHONY: Evaluation of telephony – Multiple access procedures – Mobile computing through telephone – IVR Application – Voice XML – TAPI

UNIT III   **(Hours - 12)**

    EMERGING TECHNOLOGIES: Blue Tooth – RFID – WiMAX –Mobile IP –IPv6 – Java Card. **GSM** : Global System for mobile communications – GSM Architecture – GSM Entities – Call routing in GSM –PLMN Interfaces – GSM Addresses and Identifiers – Network Aspects in GSM – GSM Frequency allocations –Authentications and Security.- **SMS**

UNIT IV   **(Hours - 12)**

    GPRS – GPRS and packet data network – GPRS network architecture – GPRS network operations – Data services in GPRS – Applic ation for GPRS- Limitations – Billing and Charging. **WAP** : MMS – GPRS Applications

UNIT V   **(Hours - 12)**

    CDMA and 3G: Spread spectrum technology – Is 95 – CDMA vs GSM – Wireless Data – Third generation networks – Applications on 3G WIRELESS LAN: Wireless LAN advantages – IEEE 802.11standards – Architecture – Mobile in Wireless LAN – Deploying wireless LAN – Mobile adhoc networks and sensor networks –Wireless LAN Security –WiFi vs 3G

Text Book

1. Mobile Computing, Asoke K Talukder , Roopa R Yavagal, TMH, 2005 , 2nd Edition.

References Book

1. J.Schiller, Mobile Communications, Second Edition, Second Impression, Pearson Education Limited.

SEMESTER-VI
ELECTIVE 3: DISTRIBUTED COMPUTING

Subject Code: 16U6CAET3C   **Total Hrs: 60**   **No. Of Credits: 3**

Objectives:
- To Study the core ideas behind modern coordination and communication paradigms and distributed data structures.
- To introduce variety of methodologies and approaches for reasoning about concurrent and distributed programs.
- To study the safety and progress properties of concurrent and distributed algorithms.

UNIT I   **(Hours-10)**
Distributed Systems: Fully Distributed Processing systems –Networks and interconnection structures –designing a distributed processing g system.

UNIT II   **(Hours-11)**
Distributed systems: Pros and Cons of distributed processing – Distributed databases –the challenges of distributed data – loading, factors –managing the distributed resources division of responsibilities.

UNIT III   **(Hours-14)**
Design considerations: Communication Line loading –line loading calculations - partitioning and allocation -data flow systems –dimensional analysis - network database design considerations - ration analysis - database decision trees - synchronization of network databases.

UNIT IV   **(Hours-11)**
Client server network model: Concept –file server – printer server and e-mail server.

UNIT V   **(Hours-14)**
Distributed databases: An overview, distributed databases -principles of distributed databases –levels of transparency -distributed database design - the R* project techniques problem of heterogeneous distributed databases .

Text Book
1. John a. Sharp, ―An introduction to distributed and parallel processing Blackwell Scientific Publication (Unit I & III) 2008.
2. Uyless D. Black, ―Data communication and distributed networks (unit II),1993.
3. Joel M.Crichllow ―introduction to distributed & parallel computing(Unit IV)1998.

Reference Books
1. Stefans Ceri, Ginseppe Pelagatti ―Distributed database Principles and systems McGraw Hill ,2008.

SEMESTER – VI
ELECTIVE 4: COMPILER DESIGN

Subject Code : 16U6CAET4A   **Total Hrs : 60**   **No. of Credits : 3**

Objectives

To enable the students
- To understand the structure and fundamental techniques of compiler
- To learn each and every step of compiler
- To understand the major concept areas of language translation and compiler design.
- To learn the code generation and code optimization techniques of compiler

UNIT I   **(Hours - 12)**

Introduction to Compilers: Compilers and Translators – The Structure of a Compiler Lexical Analysis – Syntax analysis – Intermediate Code generation – Optimization – Code generation- Book keeping – Error handling – Compiler writing tools. **Programming languages:** High level Programming languages- Definitions – lexical and Syntactic structure of a language – data elements data structures – operators – assignment – statements.

UNIT II   **(Hours - 12)**

Finite Automata and lexical Analysis: The role of the lexical analyzer – simple approach – regular expressions -finite automata – from regular expressions to finite automata – minimizing the number of states – implementation of lexical analyzer. **The Syntactic Specifications of programming languages :** Context free Grammers – Derivations and Parse Trees – Capabilities of Context free Grammers.

UNIT III   **(Hours - 12)**

Basic Parsing Techniques: Parsers – Shift – reduce parsing – operator- precedence parsing – Top down parsing – Predictive parsers**. Automatic Constuction of Effective parsers :** LR parsers – Canonical Collection of LR (0) items - Constructing SLR parsing tables – Constructing Canonical LR paqrsing tables – Constructing LALR parsing tables.

UNIT IV   **(Hours - 12)**

Symbol tables : the Contents of a symbol tables – data structures – Representing scope information.**Error Detection and Recovery :** Errors – Lexical phase errors – Syntactic phase errors – Semantic errors.

UNIT V   **(Hours - 12)**

Introduction to Code Optimization : The principal sources of optimization – Loop Optimization – DAG representation of basic blocks – Value numbers and algebric laws- global data flow analysis.**Loop Optimization:Dominators – Reducible Flow graphs – depth first search – Loop invariant computations – Induction variable elimination – Some other loop optimizations.**

TEXT BOOK

1. Principles of Compiler Design,Alfred V. Aho, Jeffrey D.Ullman,Narosa publishing house.

REFERENCE BOOKS

1. Compilers : Principles, Techniques and Tools (2nd Edition) by Alfred V.Aho and Monica S.Lam, Sep 10 , 2006.

SEMESTER – VI
ELECTIVE 4: MOBILE OPERATING SYSTEM

Subject Code: 16U6CAET4B   **Total Hrs: 60**   **No. of Credits: 3**

Objectives:
- To be able to understand the process of developing software for the mobile
- To be able to create mobile applications on the Android Platform
- To be able to create mobile applications involving data storage in SQLite database.

Unit I   **(Hours- 12)**
   Introduction to ANDROID: Android System Architecture, Creating and Running Android Applications, Types of Android Applications, Building blocks. **Android OS Concepts:** Mobile technology : Overview of Android - An Open Platform for Mobile development Open Handset Alliance. Use Android for mobile app development- Android Marketplaces - Android Development Environment setup.

Unit II   **(Hours- 12)**
   Android development Framework -Android-SDK, Eclipse Emulators /Android AVD. Creating & setting up custom Android emulator .Android Project Framework and its applications- Application Manifest, Application Life Cycle, Application Priority and Process States, Creating and Using Resources, The Activity Life Cycle.

Unit III   **(Hours- 8)**
   Android Architecture : Linux Kernel –Libraries- Android Runtime- Application Framework –Applications. Android Startup and Zygote. Android Debug bridge.Android Permission model -Android Manifest File.

Unit IV   **(Hours- 14)**
   Using Bluetooth and Managing Networks in ANDROID: Using Bluetooth – Introducing the Bluetooth Service, Controlling the Local Bluetooth Device, Discovering and Bonding with Bluetooth Devices, Managing Bluetooth Connections, Communication with Bluetooth. Managing Networks - Monitoring and Managing Your Internet Connectivity, Managing Active Connections, Managing Your Wi-Fi **.**

Unit V   **(Hours- 14)**
   Event driven Programming in Android- Creating a splash screen- Introduction to threads in Android- Develop application with menus and dialog boxes- Menu: Custom Vs. System Menus
- Creating and Using Handset menu Button (Hardware)- Android Themes, Dialog, create an Alter Dialog- **SQLite:** Open Helper and create with database- Open and close a database

Text Books
1. Reto Meier, " Professional Android 2 Application Development", 2nd Edition, 2010
2. Ed Burnette,"Hello, Android", 4th Edition 2015
3. Rick Rogers, John Lombardo, "Android Application Development" - 2009

Reference Books

1 Beginning Android Mark L Murphy Wiley India Pvt Ltd, 2009, First Edition

2. Professional Android, Sayed Y Hashimi and Satya Komatineni, Wiley India Pvt Ltd

4. Marko Garaenta, " Learning Android", 2nd edition (O'ReillyPublication)

5. Android Developers Tools essentials" (O'ReillyPublication)

SEMESTER – VI
ELECTIVE 4: PHP & MYSQL

Subject Code: 16U6CAET4C   **Total Hrs: 60**   **No. of Credits: 3**

Objectives:

- To present the introduction of open source tools.
- To enables the students to learn concepts of PHP AND MYSQL

UNIT I   **(Hours - 12)**
 What is PHP? Why use PHP? Embedding PHP with HTML, Enhancing further, PHP Language Basics: Using variable in PHP, understanding Data types, operator and expressions. Making decisions: simple decision with if statements, switch, ternary operator, do-while loop, for statement, break, loop skip iteration, nested loop, Function: calling functions, working with variable functions, own functions references, recursive functions.

UNIT II   **(Hours - 12)**
 Arrays: creating and accessing array elements, looping through arrays, multidimensional array, manipulating arrayStrings:creating and accessing strings, searching strings, replacing text within strings and formatting strings**.**

UNIT III   **(Hours - 12)**
 Handling HTML forms with PHP: HTML forms work, capture form data with PHP, multi value fields, web forms with PHP, storing PHP variables in forms, create file upload forms, redirecting PHP.

UNIT IV   **(Hours - 12)**
 Introducing Database and SQL: Deciding how to store data, quick play with MYSQL, connecting to MYSQL from PHP, retrieving data from MYSQL with PHP.

UNIT V   **(Hours - 12)**
 Manipulating MYSQL data with PHP insert, update, delete records- Working with files and directories: understanding files and directories, getting information on files, opening and closing files, reading files and writing files , file permissions, Copying ,renaming and deleting files, working with directories. Case Study: Building a text editor (to be given as assignment).

Text Book
1. Matt Doyle, Beginning PHP 5.3,Wunley India Edition,2012 .

Reference Books
1. VikramVaswani, PHP: A Beginners guide,Tata Mcgraw Hill,2009.
2. Lawpoint, Guide to PHPLP Computer series, 2007.
3. Larry Ullman, PHP 6 and MySQL 5,Pearson Education,2008.

EXTRA CREDIT COURSE: HUMAN RESOURCE MANAGEMENT

Subject Code : 16UCAECC01   **No. of Credits: 2**

Objectives:
- To understand the nature of human resources and its significance to the organization
- To familiarise students with the various techniques in HRM that contribute to the overall effectiveness of an organization.
- To bring the attention of the students on the latest trends in managing human resources in an organization.

UNIT I

Human Resource Management :Definition – Objectives – Functions - Evolution And Growth Of HRM– Qualities Of A Good HR Manager – Changing Roles of a HR Manager-– Problems And Challenges of a HR Manager.

UNIT II

Planning The Human Resources :definitions Of Human Resource Planning – Objectives – Steps In Human Resources Planning – Dealing With Surplus And Deficient Man Power - Job Analysis – Job Description – Job Specification.

UNIT III

Recruitment & Selection : Recruitment And Selection – Objectives of Recruitment – sources – Internal And External Recruitment – Application Blank – Testing – Interviews.

UNIT IV

Training & Development :Training and development – Principles of Training – Assessment Of Training Needs – on the Job Training methods - off the Job Training Methods – Evaluation of Effectiveness of Training Programmes.

UNIT V

Performance Appraisal :Performance Appraisal– process – Methods of Performance Appraisal – Appraisal Counseling – Motivation process – Theories of motivation – Managing Grievances and Discipline.

Text Books
1. Tripathi: "Personnel Management", Sultan Chand & Sons, New Delhi, 2000.
2. L M Prasad: "Human Resource Management", Sultan Chand & Sons, New Delhi, 2005.

References Books
1. Aswathappa: "Human Resource Management", Tata Mc Graw Hill Publishing Company, New Delhi, 1999.
2. Davis and Werther: "Human Resource Management", Tata Mc Graw Hill Publishing Company, New Delhi, 2000   .

EXTRA CREDIT COURSE : PRINCIPLES AND PRACTICE OF MARKETING SERVICES

Subject Code: 16UCAECC02   **No. of Credits: 2**

Objectives:
- To enable the students to gain knowledge on marketing of various services.
- To enlighten the students knowledge on marketing services.
- To make the students understand about practice of marketing services.

UNIT I

Meaning of Services Marketing – Definitions – Its importance – characteristics of services – Growth of Services Marketing – Types of services – Comparative analysis between services and products.

UNIT II

Concept of services marketing – Societal concept – Buyer behaviour concept – Factors influencing buyer behaviour – Decision making process of buyer.

UNIT III

Services Marketing Mix – Product Strategy – Product Life Cycle concept – Strategic during the P.L.C. – Product Planning Strategy – Development of new products – its simplification – Diversification and elimination.

UNIT IV

Services Marketing – I : Bank Marketing – Insurance Marketing – Transport Marketing.

UNIT V

Services Marketing – II: Tourism and Hotel Marketing - Education Marketing – Communication Services Marketing.

Reference Books

1. S.M.Jha,: "Services Marketing", Himalaya Publication House, Mumbai, Sixth Edition, 2003.

2. Christopher love lock: "Services Marketing", Person Education Chennai, Sixth Edition, 2010.

3. Philip Kotler: "Marketing Management", Person Education Chennai, Sixth Edition, 2013

4. S.Sherlekar: "Marketing Management", Himalaya Publication House, Mumbai, Sixth Edition, 1997.

EXTRA CREDIT COURSE : INVESTMENT MANAGEMENT

Subject Code: 16UCAECC03   **No. of Credits: 2**

Objectives:
- To provide knowledge on Investment Analysis
- To enable the students to understand the various types of fundamental techniques
- To familiarize the students with the Portfolio Analysis and Management

UNIT I

Investment Analysis: Nature – Scope - Elements of Investment Risk and Return - Objectives Investment - Investment Approaches - Investment analysis. Securities - Types - Features.

UNIT II

Investment Alternatives and Strategies: Financial investment - Non financial investment - Inbound and outbound investments – Sources of Investment Information - Valuation of fixed income securities and variable income securities (excluding Derivatives).

UNIT III

Fundamental Analysis: Economic Analysis – Industry Analysis - Company Analysis – Sources of information for analysis.

UNIT IV

Technical Analysis – Types of Charts – Dow Theory - Elliott Wave Theory - Odd-lot Theory - Breadth of Market - Relative Strength Analysis – Moving Average Analysis - Efficient Market Hypothesis.

UNIT V

Portfolio Analysis and Management: Portfolio Risk and Return – Diversification - Markowitz Model – Sharpe Model: Single Index Model – CAPM –Arbitrage Pricing Theory.

Reference Books

1.Preeti Singh: "Investment Management", Himalaya Publishing House, Mumbai, First Edition, 2005.

2. Bhalla and Tuteja: "Investment Management", S.Chand and Sons Publisher, New Delhi, First Edition, 1997.

3. V.A.Avadhani: "Investment Management", Himalaya Publishing House, Mumbai, First Edition, 1997.

4. Punithavathy Pandian: "Security Analysis and Portfolio Management", Vikas Publishing House Pvt Ltd, New Delhi, First Edition, 1997..

EXTRA CREDIT COURSE: CONSUMER MARKETING

Subject code: 16UCAECC04   **No. of Credits: 2**

Objectives:
- To make the students to understand the concepts of consumer marketing and the motivation theories.
- To understand the customer value chain and their demography.
- To understand market segmentation and their uses.

UNIT I

Introduction- Definition of Consumer Marketing- Need and importance- Scope- Consumer Needs- Theories of Motivation and their application- Process Theories-– Content theories- Personality and Self Concept- Theories of Personality – Trait Theory

UNIT II

Building Customer Value and Satisfaction- Delivering Customer Value- Value Chain – Value Delivery Network- Attracting and Retaining Customer Retention- Relationship Marketing- Customer Demand- Demography- Market Segmentation- Benefits- Criteria for Market Segmentation.

UNIT III

Learning Theories and their application- Brand Loyality- Brand Extention- Conditioning Theories- Cognitive Learning Theory- Attitude and Attitribute theory- Cognitive Dissonance- Self Concept- Development of Self- Fashion – Cosmetics- and Conspicious Consumption

UNIT IV

Perception- Thershold of perception- Sublinieal of Perception- Perception- Perceptual Process- Dynamics- Positioning Methods- and Measurement- Perceptual Mapping- Multidimensional Scaling- Consumer Imaginaries

UNIT V

Advertising- Role in Marketing Process- Legal and Ethical Process- Social Aspects- Function and Types of Advertising- Integrated Marketing Communication- Brand Management- Brand Equity- Image in Brand Equity Buiding- Ethics in Advertisement

Text Books
1. Schiffman L.G and Kanuk L: "Relationship Marketing", Tata MC Graw Hill, Twelfth Edition 2009.
2. R.S.N Pillai and Bhavathi : "Modern Marketing Principles and Practices", S.Chand & Co., Ltd., New Delhi, Seventh Edition, 2011.
3.Paul green Berg: "Customer Relationship Management", Tata MC Graw Hill, Seventh Edition, 2009.

Reference Books
1.Philip Kotler and Gray Armstrong: "Principles of Marketing", Pearson Education Pvt Ltd., Seventh Edition, Reprinted 2011.
2. Dr.Rajan Nair: "Marketing Management", Sulthan Chand & Sons, Eleventh Edition,

EXTRA CREDIT COURSE: INTERNATIONAL MARKETING

Subject Code: 16UCAECC05   **No. of Credits: 2**

Objectives:
- To enable the students understand the principles and concepts in International Marketing
- To provide knowledge about marketing management in the International Perspective
- To familiarise the students with marketing strategies for the dynamic International Markets.

UNIT I

The importance and scope of marketing - Evolution of marketing: From transaction-based to relationship marketing- Marketing research and Decision support systems - Market Segmentation - Targeting and Positioning.

UNIT II

Product Mix - Product Management Decisions, Product Life Cycle strategies - New Product Development - Pricing considerations and approaches - Pricing strategies.

UNIT III

Distribution channels and physical distribution.- Marketing Communication and Promotion mix Strategies - Nature of International Marketing: Meaning - Framework for International Marketing - Barriers for International Marketing

UNIT IV

International Marketing Decisions: Product Planning - Designing Development for International Markets - Pricing Decisions: Pricing Strategies and Price setting for International Markets.

UNIT V

Distribution: Channel Management and Physical Distribution - Management in International Marketing Promotion: International Advertising Programs - Sales Management and Sales Promotion for Foreign Markets.

Text Books
1. P. SubbaRao: "International Business", Himalaya Publication House, Second Edition 2010.
2. Saxena: "Marketing Management", Himalaya Publication, Thirteenth Edition, 2010.

Reference Books
1. Warren J Keegan: "Global Marketing", Pearson Education, Seventh Edition, 2002.

2. Franis Cherunilan: "International trade and Export Management", Himalaya Publication

   House, First Edition, 2012.

3. Paras Ram: "International Business", Anupam publication, 21st Edition, 2012.

EXTRA CREDIT COURSE: PRODUCTION AND OPERATIONS MANAGEMENT

Sub Code: 16UCAECC06   **No. of Credits: 2**

Objectives: On successful completion of the course, the students should have understood.
- The key areas of production and layout.
- The concept of Materials management and Supply Chain Management.
- The concept of Total quality management.

UNIT I

Production Management - Functions - Scope - Plant location - Factors - Site location - Plant layout - Principles - Process - Product layout. Production planning and control - Principles - Meaning - Routing - Scheduling - Dispatching - Control.

UNIT II

Materials Handling - Importance - Principles - Criteria for selection of material handling equipments. Maintenance - Types - Breakdown - Preventive - Routine - Methods study - Time study - Motion study.

UNIT III

Organization of Materials Management - Fundamental Principles - Structure - Integrated materials management. Purchasing – procedure - principles - import substitution and import purchase procedure. Vendor rating - Vendor development.

UNIT IV

Function of Inventory - Importance - Tools - ABC, VED, FSN Analysis - EOQ - Reorder point - Safety Stock - Lead time Analysis. Store keeping - Objectives - Functions - Store keeper - Duties – Responsibilities, Location of store - Stores Ledger - Bin card.

UNIT V

Quality control - Types of Inspection - Centralised and Decentralised. TQM: Meaning - Objectives - elements – Benefits. Bench marking: Meaning - objectives – advantages. ISO: Features - Advantages - Procedure for obtaining ISO.

Text Book
1.S.K.Sarangi: "Production and Materials Management", Asian Books Publications - Edition 2012.

Reference Books

1.Sudhir Kausik: "Production and Materials Management", Anmol Publications , Edition 2014.
2.Stan C. Mc Donald: "Materials Management – An executive supply chain", Wilsey publishers , Edition 2009.

3.John W.Toomey: "Inventory Management – Principles, concepts and Techniques", Springer Publications, First Edition, 2012.
4.Neeti Gupta & Anuj Gupta: "Production and Materials Management", Kalyani Publishers - Edition 2015

EXTRA CREDIT COURSE: ENTREPRENEURIAL DEVELOPMENT

Subject code: 16UCAECC07   **No. of Credits: 2**

Objectives:
- To enable the students to learn the concept of entrepreneur.
- To enable the students to know the fundamentals of being a good entrepreneur
- To make the students to understand the concepts relating to incentives and subsidies.

UNIT I

Concept of Entrepreneurship: Definition, Nature and characteristics of entrepreneurship – functions and type of entrepreneurship, phases of EDP, Development of women entrepreneur & rural entrepreneur including self employment of women council scheme

UNIT II

The start up process, project identification – selection of the product – project formulation- eveluation – feasibility analysis, project report

UNIT III

Institutional service to entrepreneur – DIC, SIDO, NSIC, SISI, SSIC, SIDCO – OTCOT, IIC, KUIC and commercial bank.

UNIT IV

Institutional finance to entrepreneur – IFCI,SFC,IDBI,ICICI,TIIC,SIDCS,LIC and GIC,UTI,SIPCOT – SIDBI commercial bank venture capital

UNIT V

Incentives and subsidies – subsided services – subsidy for market, Transport – seed capital assistance – Taxaton benefits to SSI, Role of Entrepreneur in export promotion and import substitution.

Text Books
1. C.B.Gupta and N.P.Srinivasan: "Entrepreneurial Development", Sultan Chand & Sons, Fifth Edition, 2008.
2. Renu Arora & S.KI.Sood: "Fundamentals of Entrepreneurship and Small Business", Kalyani Publishers, First Revised, 2014 Rept. 2014.

Reference Books
1. S.S.Khanka, "Entrepreneurial Development", S.Chand and Company Limited, New Delhi, Edition, 2001.
2. P.Saravanavel,"Entrepreneurial Development", Ess Pee Kay Publishing House, Chennai Edition, 1997.

EXTRA CREDIT COURSE: MANAGEMENT INFORMATION SYSTEM

Sub Code: 16UCAECC08   **No. of Credits: 2**

Objectives:
- To familiarise the students with Business Information through Computers.
- To enable the students aware of utilization of business information for decision making.
- To bestow knowledge about Database Management System

UNIT I

Management information system: meaning – features – requisites of effective MIS – MIS Model – components – subsystems of an MIS – role and importance – corporate planning for MIS – growth of MIS in an organization – centralization vs decentralization of MIS - Support – Limitations of MIS.

UNIT II

System concepts – elements of system – characteristics of a system – types of system – categories of information system – system development life cycle – system enhancement.

UNIT III

Information systems in business and management: Transaction processing system: Information repeating and executive information system.

UNIT IV

Database management systems – conceptual presentation – client server architectures networks.

UNIT V

Functional management information system: Financial – accounting – marketing – production – Human resource – business process outsourcing.

Text Books
1. Gorden B.Davis and Margrethe H.Olson: "Management Information System", Tata McGraw Hill Publication, New Delhi, 1st Edition, 2005.
2. Aman Jindal: "Management Information system", Kalyani Publishers, New Delhi, First Edition, 2004.

Reference Books
1. Kenneth C. Laudon: "Management Information System", Pearson Education, New Delhi, First Edition, 2004.
2. Stephen Haag: "Management Information System", Tata McGraw Hill Publication, New Delhi, First Edition, 2008.

EXTRA CREDIT COURSE : EXECUTIVE BUSINESS COMMUNICATION

Sub Code: 16UCAECC09   **No. of Credits: 2**

Objectives:
- To develop the written and oral Communication skill.
- To nurture the communication skills relating to business.
- To enable the students to prepare a good business report.

UNIT I

Business Communication: Meaning – Importance of Effective Business Communication- Modern Communication Methods – Business Letters : Need – Functions - Kinds - Essentials of Effective Business Letters - Layout.

UNIT II

Trade Enquiries - Orders and their Execution - Credit and Status Enquiries – Complaints and Adjustments - Collection Letters – Sales Letters – Circular Letters.

UNIT III

Banking Correspondence-Insurance Correspondence -Agency Correspondence.

UNIT IV

Company Secretarial Correspondence (Includes Agenda, Minutes and Report Writing)

UNIT V

Application Letters – Preparation of Resume - Interview: Meaning – Objectives and Techniques of various types of Interviews – Public Speech – Characteristics of a good speech – Business Report Presentations.

Text Books
1. Rajendra Pal and J.S.Korlahalli: "Essentials of Business Communication", Sultan Chand and Sons, New Delhi, 2014.
2. M.S.Ramesh and C. C Pattanshetti, "Business Communication", R.Chand and Co, New Delhi, 2003.

Reference Books
1. C.B.Gupta: "Business Communication and Customer Relations, Sultan Chand and Co, 2000
2. M.V. Rodriquez: "Effective Business Communication Concept", Vikas Publishing Company, 2003.

EXTRA CREDIT COURSE: BRAND MANAGEMENT

Sub Code: 16UCAECC10   **No. of Credits: 2**

Objectives:
- To understand the methods of managing brands and strategies for brand management.
- To successfully establish and sustain brands and lead to extensions

UNIT I

Basics Understanding of Brands – Definitions - Branding Concepts – Functions of Brand - Significance of Brands – Different Types of Brands – Co branding – Store brands.

UNIT II

Strategic Brand Management process – Building a strong brand – Brand positioning – Establishing Brand values – Brand vision – Brand Elements – Branding for Global Markets – Competing with foreign brands.

UNIT III

Brand image Building – Brand Loyalty programmes – Brand Promotion Methods – Role of Brand ambassadors, celebrities – On line Brand Promotions.

UNIT IV

Brand Adoption Practices – Different type of brand extension – Factors influencing Decision for extension – Re-branding and re-launching.

UNIT V

Measuring Brand Performance – Brand Equity Management - Global Branding strategies - Brand Audit – Brand Equity Measurement – Brand Leverage -Role of Brand Managers– Branding challenges & opportunities.

Text Book
1. Keller/Parameswaran & Jacob: "Strategic Brand Management: Building, Measuring, and Managing Brand Equity", Pearson Education India; Fourth Edition 2015.

Reference Books
1. Y.L.R. Moorthi: "Brand Management", Vikas Publishing House, First Edition 2003.
2. Sagar Mahim, D. P. Agrawal : "Brand Management", ANE Books Edition 2009.
3. Kirti Dutta: "Brand Management: Principles and Practices", Oxford University Press, Edition 2012.
4. Ranjeet Verma: "Brand Management", Laxmi Publications, First Edition 2009.

EXTRA CREDIT COURSES : STRESS MANAGEMENT

Sub Code: 16UCAECC11   **No. of Credits: 2**

Objectives:
- To provide a broad physical, social and psychological understanding of stress.
- To understand the management of work related stress
- To develop and implement effective strategies to prevent and manage stress at work.

UNIT I
Meaning – Symptoms – Works Related Stress – Individual Stress – Reducing Stress – Burnout.

UNIT II
Time Management – Techniques – Importance of planning the day – Time management schedule – Developing concentration – Organizing the Work Area – Prioritizing – Beginning at the start – Techniques for conquering procrastination – Sensible delegation – Taking the right breaks – Learning to say 'No'.

UNIT III
Implications – People issues – Environmental issues –Psychological fall outs – Learning to keep calm – Preventing interruptions – Controlling crisis – Importance of good communication – Taking advantage of crisis – Pushing new ideas – Empowerment.

UNIT IV
Developing a sense of Humour – Learning to laugh – Role of group cohesion and team spirit – Using humour at work – Reducing conflicts with humour.

UNIT V
Improving Personality – Leading with Integrity – Enhancing Creativity – Effective decision Making – Sensible Communication – The Listening Game – Managing Self – Meditation for peace – Yoga for Life.

Text Book
1.D M Pestonjee, Stress and Work: "Perspectives on Understanding and Managing Stress", SAGE Response, First Edition 2013.

Reference Books

1. Kamlesh Jani, Ratish Kakkad, Stress Management, Pothi Publishers, Edition 2008.
2. Aarti Gurav , Time Management , Buzzing stock Publishing House, First Edition 2014.
3. Sanjay Kumar, Pushp Lata, Communication Skills, Oxford University Press, Second Edition 2015.
4. Barun Mitra, Personality Development and Soft Skills, Oxford University Press, Second Edition 2017.

EXTRA CREDIT COURSES : THEORY OF COMPUTATION

Sub Code: 16UCAECC12   **No. of Credits: 2**

Objectives:
- To learn about the basic of theory of computing
- To understand the concept of finite automata and push down automata
- To acquire knowledge in formal language
- To enhance the concept of conversion of deterministic automata to non deterministic automata.

UNIT I
Introduction to theory of Computing – Why Study the theory of Computing- What is Computation- Set theory-Alphabets-Strings and Languages-Relations-Functions-Graphs and Trees.

UNIT II
Finite Automata: Introduction-Finite state Machines -Deterministics Finite Automata(DFA)-Finite Automata with and without Epsilon Transitions-Language of Deterministic Finite Automata-Acceptability of a String by a Deterministic Finite Automata-Processing of Strings by Deterministic Finite Automata;Non-Deterministic Finite Automata(NFA)- Language of Non- Deterministic Finite Automata-Equivalence between DFA and NFA-Non Deterministic Automata with or without Epsilon Transitions.

UNIT III
Formal Language: Introduction-Theory of Formal Language-Kleene and positive Closure-Defininig Language-Recursive Definition of Language-Arithmetic Expression-Grammar-Classification of Grammar and Language-Language and their Relation-Operations On Language-Chomsky Hierrachy.

UNIT IV
Regular Language: Introduction-Regular Language and Expression-Operations of Regular Expression-Identity Rules-Algebraic Laws for Regular Expression-Finite Automata and Regular Expression- Kleene's Theorem-Problems-Context Free Grammar and Context Free Language: Introduction-Derivation Tree-Parse Tree-Right Most and Left most Derivation -Ambiguity-Problems

UNIT V
Push Down Automata: Description and Definition-Language of PDA-Graphical Notation of PDA-Acceptance by Final State and Empty Stock, From Empty Stock to Final State and Vice versa-Deterministic Pushdown Automata and Non deterministic Pushdown Automata-Language-Problems.

Text Book

1. Theory of Computing-A Gentle Introduction, Efim Kinber, Carl Smith, published by Pearson Education.(UNIT 1)
2. Theory of Automata, Language & Computation, Rajendra Kumar, Tata McGraw Hill Education Private Limited, New Delhi. (UNIT 1to 5)

Reference Book

1. A Textbook Automata Theory, S.F.B.Nasir, P.K.Srimani, Published by Cambridge University Press India Pvt, Ltd, New Delhi.

UNIT 1: Chapter 1: Section 1.1, 1.2 (Text Book 1)
             Chapter 1: Section 1.1-1.6 (Text Book 2)
UNIT 2: Chapter 2: Section 2.1-2.11
UNIT 3: Chapter 3: Section 3.1-3.10
UNIT 4: Chapter 4: Section 4.1-4.5, 4.6, 4.6.1, 4.6.2
             Chapter 6: Section 6.1-6.10
UNIT 5: Chapter 7: Section 7.1-7.10