

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 result nearly 75% of the students are able to get placement offers 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 is Re-accredited with “A” Grade by National Assessment and Accreditation Council (NAAC).

KOVAI KALAIMAGAL COLLEGE OF ARTS AND SCIENCE

(An Autonomous Institute Affiliated to Bharathiar University)

Accredited with “A” grade by NAAC

(Under Choice Based Credit System)

CURRICULUM DESIGN AND STRUCTURE

(Effective from 2016 -17)

1. REGULATIONS

This regulation is effective from the academic year 2016 -17.

1.1 Eligibility for Admission

S.No	Course	Eligibility Condition
1	B.Sc Mathematics (CA)	A pass in higher secondary course and studied Mathematics as one of the subject.

The candidates who have passed Higher Secondary Examination (XII standard) conducted by the Government of Tamil nadu or an equivalent examinations shall be eligible to join the first year of the UG degree courses.

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 with 5 hours a day.

1.3 The Medium of Instruction and Examinations

The medium of instruction and examinations shall be English.

1.4. Requirements for Attendance

- 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.
- 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.
- 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 .

- 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%.
- 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 on equivalent paper in the revised syllabus as suggested by the chairman and fulfil 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 Internal Assessment (CIA) and End Assessment Examination (EAE). The Continuous Internal Assessment, End Assessment Examination break up for theory papers is 25:75 and practicals is 40:60.

1.6.1. Break Up of Continuous Internal Assessment (CIA)**Theory**

Content	Marks Awarded
Internal Assessment Test	05
Online Test	05
Model Examination	10
Assignment (2 Numbers)	05
Total	25

For UG Courses – 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.

Practical

Content	Marks Awarded
Minimum ten Experiments / Practical Paper / Semester	20
Internal Assessment Test	05
Model Exam	10
Record Note Book	05
Total	40

1.6.2. End Assessment Examinations (EAE)

- Semester examination will be conducted at the end of each semester after completing a minimum of 90 working days.
- End Assessment Examination for the odd semester will generally be held during November and even semester during April.
- The question papers for all the courses will be set by the external examiners.
- The exam 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 CA and EAE marks together will be 40%.
- Question Paper Pattern: **(Core 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 exam will be conducted for a maximum of 50 marks for three hours. The passing minimum is 40% (20 out of 50 marks).
- g) Extra Credit Course will be valued for a total of 100 marks. The pattern of the Question paper will be as follows:
- 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 opt for only two papers per semester under the extra credit courses from third semester onwards.
- k) The extra credit courses are self learning courses for which only guidance will be provided by the faculty.

l) For UG Courses - Practical

Content	Marks Awarded	Marks Awarded
Program – 1	20	10
Program – 2	20	10
Viva voce	10	05
Record	10	05
Total	60	30

- m) There will be one independent valuation for all theory papers of UG courses by external examiner.
- n) 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 fees. This provision is available for all theory papers taken in the EAE. However there is no provision for revaluation of Practical papers.
- o) 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.

- p) 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:

$$\text{GRADE POINT AVERAGE [GPA]} = \frac{\sum_i C_i G_i}{\sum_i C_i}$$

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

For the Entire Programme:

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

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

CGPA	Grade	Classification of Final Result
9.0 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-Appearence

* 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.

2. PROGRAMME STRUCTURE – OVERVIEW

2.1 Mandatory Credits

The total number of mandatory credits to be earned by a student to qualify for B.Sc.,Mathematics(CA) degree is 140. The credit for a paper is fixed by giving due weightage to the contents of the curriculum. The maximum total mark to be earned by the student is 3700.

2.2 Curriculum Structure

S.No	Courses	No.of.Papers	Credits
1	Language	02	06
2	English	02	06
3	Core papers	21	84
4	Allied papers	04	16
5	Elective papers	04	12
6	Value Based papers	02	04
7	Non-Major Electives	02	04
8	Skill Based papers	04	08
9	Non-Credit Courses	02	-
Total Credits			140

SCHEME OF EXAMINATION AND PROGRAMME STRUCTURE

B.Sc (Mathematics with Computer Applications) (2016-2019)

Part	Subject Code	Study Components	Ins. hours per week	CIA	Exam	Total	Credits
Semester – I							
I	16U1TALT01	Language 1: Paper 1	5	25	75	100	3
II	16U1ENLT01	Language 2 :English 1	5	25	75	100	3
III	16U1MCCT01	Core 1: Calculus	6	25	75	100	5
	16U1MCCT02	Core 2: Classical Algebra	6	25	75	100	5
	16U1MCAT01	Allied 1: Mathematical Statistics - I	6	25	75	100	4
IV	16U1VBET01	Value Based Education 1: Environmental Studies**	2	-	50	50	2
Total Credits				-	-		22
Semester – II							
I	16U2TALT02	Language 1: Paper 2	5	25	75	100	3
II	16U2ENLT02	Language 2: English 2	5	25	75	100	3
III	16U2MCCT03	Core 3: Analytical Geometry	5	25	75	100	5
	16U2MCCT04	Core 4: Programming in C	4	25	75	100	4
	16U2MCCP05	Core 5: Programming in C – Practical	3	40	60	100	2
	16U2MCAT02	Allied 2: Mathematical Statistics - II	6	25	75	100	4
IV	16U2VBET02	Value Based Education 2 : Ethics and Culture**	2	-	50	50	2
Total Credits							23
Semester – III							
III	16U3MCCT06	Core 6: Trigonometry, Vector Calculus & Fourier Series	6	25	75	100	5
	16U3MCCT07	Core 7: Statics	6	25	75	100	4
	16U3MCCT08	Core 8: Programming in C++	5	25	75	100	4
	16U3MCCP09	Core 9: Programming in C++ -Practical	3	40	60	100	2
	16U3MCAT03	Allied 3: Accountancy - I	7	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
Semester – IV							
III	16U4MCCT10	Core 10: Differential Equations & Laplace Transforms	6	25	75	100	5
	16U4MCCT11	Core 11: Dynamics	6	25	75	100	4
	16U4MCCT12	Core 12: Data Structures using C++	5	25	75	100	4
	16U4MCCP13	Core 13: Data Structures using C++ –Practical	3	40	60	100	2
	16U4MCAT04	Allied 4: Accountancy – II	7	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			-	-	-		25
Semester V							
III	16U5MCCT14	Core 14: Real Analysis	6	25	75	100	5
	16U5MCCT15	Core 15: Modern Algebra	6	25	75	100	5
	16U5MCCT16	Core 16: Visual Basic	5	25	75	100	4
	16U5MCCP17	Core 17: Visual Basic – Practical	3	40	60	100	2
		Elective 1:	5	25	75	100	3
		Elective 2:	5	25	75	100	3
	16U5NCCT01	Non Credit Course : Aptitude and Soft Skills – I	3	-	-	-	-
		Sports	2	-	-	-	-
		Library	1	-	-	-	-
Total Credits			-	-	-		22
Semester – VI							
III	16U6MCCT18	Core 18: Complex Analysis	5	25	75	100	5
	16U6MCCT19	Core 19: Discrete Mathematics	5	25	75	100	5
	16U6MCCT20	Core 20: Mat Lab	5	25	75	100	5
	16U6MCCP21	Core 21: Mat Lab - Practical	5	40	60	100	2
		Elective 3:	5	25	75	100	3
		Elective 4:	5	25	75	100	3
	16U6NCCT02	Non Credit Course : Aptitude and Soft Skills – II	3	-	-	-	-
		Sports	2	-	-	-	-
		Library	1	-	-	-	-
Total Credits			-	-	-		23
Total			204			3700	140

* will not be considered for the calculation of CGPA

** 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 Hrs/Week during III and IV Semesters after their regular college working hours.

List of Electives

Electives	Subject Code	Name of the Subjects
Elective 1	16U5MCET1A	Optimization Techniques - I
	16U5MCET1B	Software Engineering
	16U5MCET1C	Linear Algebra
Elective 2	16U5MCET2A	Numerical Methods
	16U5MCET2B	Number Theory
	16U5MCET2C	Digital Electronics and Computer Fundamentals
Elective 3	16U6MCET3A	Optimization Techniques - II
	16U6MCET3B	Actuarial Mathematics
	16U6MCET3C	Information Security
Elective 4	16U6MCET4A	Fuzzy Mathematics
	16U6MCET4B	Applied Mathematics
	16U6MCET4C	Computer Networks

Extra Credit Courses

Sub Code	Subject	Credits
16UMCECC01	Human Resource Management	2
16UMCECC02	Principle and Practice of Marketing Services	2
16UMCECC03	Investment Management	2
16UMCECC04	Consumer Marketing	2
16UMCECC05	International Marketing	2
16UMCECC06	Production and Operations Management	2
16UMCECC07	Entrepreneurial Development	2
16UMCECC08	Management Information System	2
16UMCECC09	Executive Business Communication	2
16UMCECC10	Basic Business Law	2
16UMCECC11	Stress Management	2
16UMCECC12	E-Commerce	2
16UMCECC13	OOPS with Java Programming	2

SEMESTER - I
LANGUAGE 1: PAPER 1

Subject Code: 16U1TALT01

Total Hrs: 75

No. of Credits: 3

Kjy; gUtk; (nra;As; ,rpWfij, ,yf;fzk; , ,yf;fpa tuyhW)

Nehf;fk;

- r%fk; gw;wpa rpe;jidfisj; jkpo;g; gilg;gpyf;fpaq;fs; %yk; Vw;gLj;Jjy;
- Gj;ftpijfs; , rpWfijfs; Mfpatw;iwg; gbf;f itj;jy;/vOj itj;jy;
- Nghl;bj; Nju;TfSf;F khztu;fisj; jahu; nra;jy;

myF – 1 nra;As; jpul;L : kuGf; ftpijfs; (15 kzpNeuk;)

- ghujpahu; - Nahfrpj;jp (ghujpahu; ftpijfs;)
- ghujpjhrd; - jkpoDf;F tPo;r;rpapy;iy
(ghujpjhrd; ftpijfs;)
- ftpkzp - ftpij (kyUk; khiyAk;)
- fz;zjhrd; - MjpapNy thu;j;ij ,Ue;jhu; (,NaR fhtpak;)

myF – 2 nra;As; jpul;L : Gj;ftpijfs; (13 kzpNeuk;)

- GtpauR - fjhehafp (xU Kf;fpa mwptpg;G)
- mg;Jy; uFkhd; - jtwhd vz; (Myhgid)
- ituKj;j - cd; Md;kPfj;jpd; mu;j;jk; (ftpuh[d; fij)
- rpw;gp ghyRg;gpukzpak; - nfhLk;ghttp rhfhNsh (xU fpuhkj;j ejp)
- fyhg;gpupah - capu;j;njOjy; (fyhg;gpupah ftpijfs;)
- ,sk;gpiw - mrjp (Kjy; kdp\p)

myF – 3 rpWfijj; njhFg;G (20 kzpNeuk;)

- ghujpahu; - fhf;fha;; ghu;ypnkz;l;
(kfhftp ghujpahu; fijfs;)
- Gj;kg;gpj;jd; - nghd;dfuk; (Gj;kg;gpj;jd; rpWfijfs;)
- M.khjtd; - Rrpyhtpd; fij (M.khjtd; fijfs;)
- n[afhe;jd; - Njtd; tUthuh? (Njtd; tUthuh?)
- mNrhfkpj;jpud; - mg;ghttpd; rpNefpju; (mg;ghttpd; rpNefpju;)
- tz;zjhrd; - Myq;fl;bkio (tz;zjhrd; fijfs;)
- ehQ; rpy; ehld; - #ba G+ #lw;f (#ba G+ #lw;f)
- v];,uhkfpU\;zd; - njupe;jtu;fs; (v];,uhkfpU\;zd; fijfs;)
- tz;zepytd; - ,uz;lhtj nrhu;f;fk; (tz;zepytd; fijfs;)
- mk;ig - gpsh];bf; lg;ghttpy; guhrf;jp KjypNahu;
(fhl;by; xU khd;)

myF – 4 jkpo; ,yf;fpa tuyhW (15 kzpNeuk;)

- **jkpo;ehL muRg; gzpahsu; Nju;thizak; elj;Jk; Nghl;bj; Nju;Tf;Fupa nghj; jkpo;g; ghlij;jpl;lk; - Xu; mwpKfk;**
- Gj;ftpijapd; Njh;w;wKk; tsu;r;rpAk;
- rpWfijapd; Njh;w;wKk; tsu;r;rpAk;
- Gfo;ngw;w jkpo; E}y;fs;, E}yhrpupau;fs; (rpWfij, Gj;ftpij)
(ghu;it E}y;: jkpo; ,yf;fpa tuyhW)
- milnkhopahy; Fw;pf;fg;ngWk; E}y;fs;, E}yhrpupau;fs;

- (ghu;it E}y;: jkpo; ,yf;fpa tuyhW)
- Mq;fpyr; nrhy;ypw;F ,izahd jkpo;r; nrhy; (ghu;it E}y;: ew;wkpo; ,yf;fzk;)

myF – 5 ,yf;fzk; (12 kzpNeuk;)

- Ntu;r;nrhy; mwpjy; , mfu tupirg;gb nrhw;fis khw;wpaikj;jy;
- nra;tpid, nrage;ghl;Ltpid, cld;ghL, vjph;kiw, fyit thf;fpaq;fSk; thf;fpa tiffSk;.
- ngau; , tpid, ,il, cupr;nrhw;fs;.
- yfu-sfu-ofu, zfu-dfu – NtWghLfs;.

ghl E}y;fs;

- nra;As; jpul;L > rpWfijj; njhFg;G (jkpo;j;Jiw ntspaPL : [d; - 2016)

ghu;it E}y;fs;

- Gytu; ntw;wpaofd;(njh.M)> “ghujpahu; ftpijfs;”> uhikah gjpg;gfk;> nrd;id. Kjw; gjpg;G: Vg;uy; - 2008.
- njh.gukrptd;(g.M)> “ghujpjhrd; ftpijfs;”> epA+ nrQ;Rup Gf; `T];> nrd;id. %d;whk; gjpg;G: brk;gu; - 1998.
- tpj;Jthd; rpt fd;dpag;gd;> “kyUk; khiyAk;”> G+k;Gfhu; gjpg;gfk;> nrd;id. Kjw; gjpg;G: nrg;lk;gu; - 2002.
- ftpauR fz;zjhrd;> “,NaR fhtpak;”> fiyf;fhtpup gjpg;gfk;> jpUr;rp. le;jhk; gjpg;G: 1997.
- GtpauR> “xU Kf;fpa mwptpg;G”> tp[ah gjpg;gfk;> Nfhit. ,uz;lhk; gjpg;G: brk;gu; - 2005.
- mg;Jy; uFkhd;> “Myhgid”> Nerdy; gg;sp\u;];> nrd;id. ehd;fhk; gjpg;G: Vg;uy; - 2003.
- ituKj;J> “ftpuh[d; fij”> jpUkfs; gjpg;gfk;> nrd;id. gdpnuz;lhk; gjpg;G: nrg;lk;gu; -2007.
- rpw;gp> “xU fpuhkj;J ejp”> ftpjh gjpg;gfk;> nrd;id. vl;lhk; gjpg;G: Mf];L-2011.
- fyhg;gpupah> “fyhg;gpupah ftpijfs;”> jkpopdp gjpg;gfk;> nrd;id. Kjw; gjpg;G: brk;gu; - 2001.
- இளம்பிறை, “முதல் மனுஷி”, தமிழ் நெஞ்சம், மயிலாடுதுறை. முதற் பதிப்பு: டிசம்பர் -2003.
- சி.சுப்பிரமணிய பாரதி, “மகாகவி பாரதியார் கதைகள்”, சேது அலமி பிரசுரம், சென்னை. இரண்டாம் பதிப்பு: டிசம்பர்- 2003.
- புதுமைப்பித்தன் கதைகள், பூம்புகார் பதிப்பகம், சென்னை. இரண்டாம் பதிப்பு: ஜூலை -2006.
- மாதவன், “ஆ.மாதவன் கதைகள்”, தமிழினி பதிப்பகம், சென்னை. முதற்பதிப்பு: டிசம்பர்- 2001.
- ஜெயகாந்தன், “தேவன் வருவாரா”, மீனாட்சி புத்தக நிலையம், மதுரை.

நான்காம் பதிப்பு: ஜூன் - 1996.

- அசோகமித்திரன், “அப்பாவின் சிநேகிதர்”, நர்மதா வெளியீடு, சென்னை.
இரண்டாம் பதிப்பு: டிசம்பர் - 1996.
- வண்ணதாசன், கனிவு, சந்தியா பதிப்பகம், சென்னை. இரண்டாம் பதிப்பு: ஏப்ரல் - 2011.
- நாஞ்சில் நாடன், “சூடிய பூ சூடற்க”, தமிழினி பதிப்பகம், சென்னை. மூன்றாம் பதிப்பு: 2010.
- எஸ்.ராமகிருஷ்ணன், “எஸ்.ராமகிருஷ்ணன் கதைகள்”, கிழக்கு பதிப்பகம், சென்னை.
இரண்டாம் பதிப்பு: ஏப்ரல் - 2005.
- வண்ணநிலவன், “வண்ணநிலவன் சிறுகதைகள்”, நற்றிணை பதிப்பகம், சென்னை.
இரண்டாம் பதிப்பு: ஆகஸ்ட்டு - 2013.
- அம்பை, “காட்டில் ஒரு மான்”, காலச்சுவடு பதிப்பகம், சென்னை. மூன்றாம் பதிப்பு:
டிசம்பர் - 2003.
- வல்லிக்கண்ணன், “புதக்கவிதையின் தோற்றமும் வளர்ச்சியும்”, அகரம், சும்பகோணம்.
நான்காம் பதிப்பு: ஜூலை - 1999.
- கா.கோ.வெங்கட்ராமன், “தமிழ் இலக்கிய வரலாறு”, கலையக வெளியீடு, திண்டுக்கல்.
இரண்டாம் பதிப்பு: ஜூன் - 2002.
- மது.ச.விமலானந்தம், “தமிழ் இலக்கிய வரலாறு”, முல்லை நிலையம், சென்னை. 2014
- மு.பரமசிவம், “நற்றமிழ் இலக்கணம்”, சைவசித்தாந்த பதிப்பகம், திருநெல்வேலி.
முதற் பதிப்பு: 1995.

SEMESTER - I
LANGUAGE 2: ENGLISH - 1

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: CALCULUS****Subject Code: 16U1MCCT01****Total Hrs: 90****No. of Credits: 5****Objectives:**

- To gain knowledge about Envelope, Curvature and Evolute of Curve
- To apply integral Calculus in Solving problems
- To understand the concept of Proper and improper integrals.

UNIT I**(15 Hrs)**

Envelopes - Method of finding the Envelope- Curvature – Circle, Radius and Center of curvature – The Co-ordinates of the Center of Curvature.

UNIT II**(15Hrs)**

Evolute and Involute – Radius of Curvature when the curve is given in Polar Co-ordinates - Pedal equation of curves – Chord of Curvature.

UNIT III**(20 Hrs)**

Evaluation of integrals of the form $\int \frac{f'(x)}{f(x)} dx$, $\int \frac{px+q}{\sqrt{ax^2+bx+c}} dx$, $\int \sqrt{\frac{x-a}{b-x}} dx$, $\int \sqrt{(x-a)(x-b)} dx$, $\int \frac{1}{a\cos x + b\sin x + c} dx$, $\int \frac{1}{a\cos^2 x + b\sin^2 x + c} dx$, Integration by Parts- Reduction Formulae for $\int \sin^n x dx$, $\int \cos^n x dx$ - Evaluation of $\int \sin^m x \cos^n x dx$ - Evaluation of $\int e^{ax} \cos bx dx$, $\int e^{ax} \sin bx dx$.

UNIT IV**(20 Hrs)**

Multiple Integrals – Definition – Evaluation of Double integrals in Cartesian, polar coordinates - Change of order of integration – Application of Double integral to calculate area under curves - Triple integrals.

UNIT V**(20 Hrs)**

Beta and Gamma functions – Definition – properties - Relation between Beta and Gamma functions. Jacobians – Definition – properties (without proof)- Jacobians for standard transformations- Evaluation of Double integrals and Triple integrals using Jacobians, Beta and Gamma functions.

Text Book:

S. Narayanan and T.K.M. Pillai : Calculus vol I and vol II - Viswanathan Publishers- 2010.

Unit I : Vol I - Chapter-10 Section – 1.1 to 1.4, 2.1 to 2.4.

Unit II : Vol I - Chapter -10 Section – 2.5 - 2.7

Unit III : Vol II - Chapter -1 Section - 6.5, 8 case (ii), case (ix), 12, 13.3,- 13.5,14

Unit IV : Vol II - Chapter -5 Section - 2.1, 2.2, 3.1, 4, 5.1, .

Unit V : Vol II -Chapter -7 Section - 2.1, 2.3, 3, 4, 6. Chapter -6 Section - 1.1,1.2, 2.1 to 2.4

Reference Books:

1. P. Kandasamy ,K.Thilagarathy : *Mathematics for BSc– Vol I and II - S.Chand and Co- 2004.*
2. Shanthi Narayanan & J.N.Kapoor : *A Text book of Calculus - S.Chand & Co – 2002.*
3. N.Piskunov: *Differential & Integral Calculus - Vol II – CBS publisher's – 1999.*
4. Dr.P.R.Vittal & V.Malini : *Margham publications– 2007.*

SEMESTER I**CORE 2 : CLASSICAL ALGEBRA****Subject Code: 16U1MCCT02****Total Hrs: 90****No. of Credits: 5****Objectives:**

- To gain knowledge about Summation of series using Binomial, Exponential and logarithmic Theorems
- To understand the concept of Convergence of Series
- To get expose with Theory of Equations and its applications

UNIT I**(20Hrs)**

Binomial theorem-Positive integral index-The greatest coefficient in the expansion $(1+x)^n$
 - The greatest term in the expansion of $(1+x)^n$ -Summation of Various series involving Binomial coefficients.Application of the Binomial theorem to the Summation of series-Approximate values.
 The exponential theorem-Summation-The application of the exponential and logarithmic series to limits and approximations

UNIT II**(15Hrs)**

The logarithmic series-series which can be summed up by the logarithmic Series-
 Miscellaneous Examples

UNIT III**(15Hrs)**

Comparison tests-Cauchy's Condensation test-D'Alembert's Ratio test
 Raabe's test-An absolutely convergent series is convergent

UNIT IV**(20Hrs)**

Relations between the roots and coefficients and Equations-Symmetric function of the roots-Sum of the powers of the roots of an equation-Transformations of equations-
 Roots with signs changed-Roots multiplied by a given number-Reciprocal roots-
 Descartes' Rule of signs-Descartes' rule of signs for negative roots

UNIT V**(20 Hrs)**

Rolle's Theorem-Multiple roots-Strum's Theorem-Newton's Method-Horner's Method

Text Book:

T.K .Manicavachagam Pillai, T.Natarajan, K-S Ganapathy.S. Viswanatham : Algebra - Printers & Publishers Private Ltd – Edition 2003.

- Unit I** : Chapter - 3 Section - 1, 10, 14 & Chapter - 4 Section - 2, 3, 11.
Unit II : Chapter - 4 Section - 5, 9, 12.
Unit III : Chapter - 2 Section - 13, 15,16,19,22.
Unit IV : Chapter - 6 Section - 11, 12,13,15,24.
Unit V : Chapter - 6 Section - 25, 26, 27, 29.4,30.

Reference Books:

1. P. Kandasamy and K. Thilagavathy : *Mathematics for B.Sc. Branch I -Vol. I- (For B.Sc - I semester) S. Chand and Company Ltd, New Delhi- 2004.*
2. A.Singaravelu & R.Rama: *Algebra and Trigonometry -I., Meenakshi agency-2003*
3. Prof. M.L.Khanna : *Algebra - Jai Prakash Nath & Co. Meerut (U.P).*
4. Dr. A. Majeed : *Text book of Algebra – Disha Publications – 1994.*

SEMESTER I**ALLIED 1 : MATHEMATICAL STATISTICS - I****Subject Code: 16U1MCAT01****Total Hrs: 90****No. of Credits:4****Objectives:**

- To understand concepts of probability and Random variable,
- To learn about Discrete and Continuous probability distributions
- To gain knowledge about Correlation and Regression Analysis

UNIT I**(20Hrs)**

Random Variables – Independence of random variables - Discrete and Continuous Random variables. Distribution Function: Properties – Probability Mass Function – Probability Density Function. Mathematical Expectation: Addition and Multiplication Theorems on Expectations – Bayes's Theorem.

UNIT II**(15 Hrs)**

Moment Generating and Characteristic Functions and their Properties. Joint Probability Distributions – Marginal and Conditional probability distributions – Independence of random variables –Tchebychev's Inequality – Weak Law of Large Numbers.

UNIT III**(20Hrs)**

Probability Distributions: Binomial – Poisson – Normal Distributions and their properties – Fitting of distributions. Chi-square, t, and F Statistics, their probability functions and their properties.

UNIT IV**(15Hrs)**

Curve Fitting and Principle of least squares: Fitting of curves of straight line, second-degree parabola, power curve and exponential curves. Correlation and Regression Analysis.

UNIT V**(20 Hrs)**

Problems related to **Unit-I** and **Unit-III** Only.

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

Text Book:

S.C. Gupta & V.K. Kapoor : Elements of Mathematical Statistics, Sultan Chand & Sons -2010

Unit I	: Chapter 5 – Section 5.1 – 5.4.1, Chapter 4 – Section 4.7.2 – 4.7.5 Chapter 6 – Section 6.1 – 6.3
Unit II	: Chapter 6 – Section 6.9, 6.11, 6.11.1, 6.12, 6.13 Chapter 5 –Section 5.5.1 – 5.5.5
Unit III	: Chapter 7– Section 7.2, 7.2.1, 7.2.2, 7.2.4 - 7.2.6, 7.3.1 - 7.3.5, 7.3.8, Chapter 8 – Section 8.2, 8.2.2 – 8.2.5, 8.2.7 – 8.2.11, 8.2.13, 8.2.14,
Unit IV	: Chapter 9- Section 1-7, Chapter 10– Section10.1- 10.3, 10.6, 10.6.1, 10.7, 10.7.1to 10.7.5

Reference Books:

- 1.C.B. Gupta, and Vijay Gupta : Introduction to Statistical Methods - 1988.
- 2.S.C.Gupta & V.K.Kapoor : Fundamentals of Mathematical Statistics – 2002.
- 3.D.C. Sanchetti, V.K. Kapoor : Statistics - Sultan Chand and Sons – 2007.
- 4.R.S.N. Pillai, V. Bagavathi : Statistics – S. Chand and Co – 2001.

SEMESTER - I

ENVIRONMENTAL STUDIES

Subject Code:16U1VBET01

Total Hrs: 30

No. of Credits: 2

Objectives:

1. To make the students understand the various types of natural resources and their responsibility in the conservation of the same.
2. To impart on various eco systems, biodiversity at various levels and their conservation
3. 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. Threats of biodiversity: habitat loss, poaching of wild life. Man wild life conflicts. Endangered and endemic species of India. Conservation of biodiversity-in-situ and Ex-situ 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. Pollution case studies. Disaster management: Floods, 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 : PAPER 2

Subject Code: 16U2TALT02

Total Hrs: 75

No. of Credits: 3

இரண்டாம் பருவம் (செய்யுள், உரைநடை, இலக்கணம் , இலக்கிய வரலாறு) நோக்கம்

- சங்க இலக்கியத்தின் மாண்பு, இலக்கிய நயம், நீதி நெறிகள், பக்தியின் தன்மை, சங்ககால இலக்கண நெறிகள் ஆகியவற்றை அறிந்து கொள்ளுதல்
- வாழ்க்கையை வாழும் நெறிமுறைகள், வெற்றிக்கான உத்திகள், தமிழ் வளர்ச்சிக்கான நமது கடமைகள் ஆகியன குறித்து தெளிவு பெறுதல்

அலகு – 1 செய்யுள் திரட்டு : சங்க இலக்கியங்கள் (20 மணிநேரம்)

- குறுந்தொகை - முதல் 5 பாடல்கள் (கடவுள் வாழ்த்து உட்பட)
- நற்றிணை - பிரசங்கலந்த வெண்கவைத்தீம்பால் (பா.எண்-110), விளையாடு ஆயமோடு (பா.எண்-68)
- கலித்தொகை - சுடர்த் தொடி கேளாய் (பா.எண்-51)
- புறநானூறு - ஆவுமானிய பார்ப்பன மாக்களும் (பா.எண்-9), காய் நெல்லறு கவளம் அறுத்துக்கொளினே (பா.எண்-184)
- பத்துப்பாட்டு - குறிஞ்சிப்பாட்டு முழுவதும்

அலகு – 2 செய்யுள் திரட்டு : நீதி, பக்தி இலக்கியம் (15 மணிநேரம்)

- திருக்குறள் - அடக்கமுடைமை (அதிகாரம்-13), புறங்கூறாமை (அதிகாரம்-19)
- நாலடியார் - கல்வி (அதிகாரம்-14), நல்லினம் சேருதல்(அதிகாரம்-18)
- திருவெம்பாவை - முதல் 10 பாடல்கள்
- நாச்சியார் திருமொழி - ஆறாம் திருமொழி

அலகு – 3 உரைநடை: கட்டுரைத் தொகுப்பு (15 மணிநேரம்)

1. இறையன்பு - கல்வியும் கடவுள் தன்மையும் (வாழ்க்கையே ஒரு வழிபாடு)
2. அகிலன் - பதினாறு பேறுகள் (வெற்றியின் ரகசியங்கள்)
3. முனைவர் பாஞ்.இராமலிங்கம் - மானிட உளவியல் (மானிட உளவியல்)
4. வ.செ.குழந்தைசாமி - தமிழ் வழிக்கல்வி-தயக்கங்கள், தடைகள் (தமிழ் வளர்ச்சி)
5. மணவை முஸ்தபா - தமிழுக்கு அறிவியல் அன்னியமா? (அறிவியல் நோக்கில் கம்பர்)
6. சுகி.சிவம் - வாழப்பழகுவோம் வாருங்கள் (வாழப்பழகுவோம் வாருங்கள்)
7. அ.மங்கை - பெண்ணியம் படைப்பு, வாசிப்பு (பெண் - அரங்கம் - தமிழ்ச்சூழல்)

அலகு – 4 இலக்கிய வரலாறு (15 மணிநேரம்)

- எட்டுத்தொகை, பத்துப்பாட்டு நூல்கள்
- நீதி நூல்கள் - அறிமுகம்
- நாயன்மார்கள் ஆழ்வார்கள் - அறிமுகம்
- உரைநடையின் தோற்றமும் வளர்ச்சியும்

அலகு – 5 இலக்கணமும் பயன்பாட்டுத் தமிழும் (10 மணிநேரம்)

- அகம், புறம் – திணை, துறை விளக்கங்கள்
- முதல் , கரு, உரிப்பொருள்
- மடல்கள், விண்ணப்பங்கள்

- மொழிபெயர்ப்பு (அலுவலகப் பகுதி, பொதுப்பகுதி)

பாட நூல்கள்

- செய்யுள் திரட்டு , கட்டுரைத் தொகுப்பு
(தமிழ்த்துறை வெளியீடு : டிசம்பர் - 2016)

பார்வை நூல்கள்

- குறுந்தொகை, கழக வெளியீடு, முதற் பதிப்பு: ஜூன் - 2000
- புலவர் நா.இராமையாபிள்ளை(உ.ஆ), “நற்றிணை”, வர்த்தமானன் பதிப்பகம், சென்னை. முதற் பதிப்பு: 1999.
- கலித்தொகை, கழக வெளியீடு, முதற் பதிப்பு: டிசம்பர் - 1996.
- புறநானூறு, கழக வெளியீடு, முதற் பதிப்பு: டிசம்பர் - 1996.
- புலவர் அ.மாணிக்கனார் (உ.ஆ), “பத்துப்பாட்டு – II ஆம் தொகுதி”, வர்த்தமானன் பதிப்பகம், சென்னை. 1999.
- பேரா.அ.மாணிக்கம்(ப.ஆ), “நாலடியார்”, மணிவாசகர் பதிப்பகம், சென்னை. முதற் பதிப்பு: செப்டம்பர்-1995.
- பேரா.அ.மாணிக்கம்(உ.ஆ), “பன்னிரு திருமுறைகள் (தொகுதி 11)”, வர்த்தமானன் பதிப்பகம், சென்னை. பிப்ரவரி - 2009.
- டாக்டர் கதிர்முருகு, “நாச்சியார் திருமொழி”, சாரதா பதிப்பகம், சென்னை. முதற் பதிப்பு: ஜூன் - 2010.
- வெ.இறையன்பு, “வாழ்க்கையே ஒரு வழிபாடு”, விஜயா பதிப்பகம், கோவை. எட்டாம் பதிப்பு: டிசம்பர் - 2013.
- அகிலன், “வெற்றியின் ரகசியங்கள்”, தாகம் பதிப்பகம், சென்னை. பதினொன்றாம் பதிப்பு: ஜனவரி – 2001.
- முனைவர் பாஞ்.இராமலிங்கம், “மானிட உளவியல்;”, சாரதா பதிப்பகம், சென்னை. திருத்திய பதிப்பு: ஜூன்- 2007.
- வ.செ.குழந்தைசாமி, “தமிழ் வளர்ச்சி”, பாரதி பதிப்பகம், சென்னை. இரண்டாம் பதிப்பு:ஜூலை – 2007.
- முனைவர் முஸ்தபா, “அறிவியல் நோக்கில் கம்பர்”, வானதி பதிப்பகம், சென்னை. இரண்டாம் பதிப்பு: 2003.
- சுகி.சிவம், “வாழப்பழகுவோம் வாருங்கள்”, வானதி பதிப்பகம், சென்னை. ஆறாம் பதிப்பு: நவம்பர் - 2003.
- ஆ.மங்கை, “பெண்-அரங்கம்-தமிழ்ச்சூழல்”, ஸ்நேகா பதிப்பகம், சென்னை. முதற்பதிப்பு:2005.
- கா.கோ.வெங்கட்ராமன், “தமிழ் இலக்கிய வரலாறு”, கலையக வெளியீடு, திண்டுக்கல். இரண்டாம் பதிப்பு: ஜூன் - 2002.
- மது.ச.விமலானந்தம், “தமிழ் இலக்கிய வரலாறு”, முல்லை நிலையம், சென்னை. 2014.
- மு.பரமசிவம், “நற்றமிழ் இலக்கணம்”, சைவசித்தாந்த பதிப்பகம், திருநெல்வேலி.

முதற்பதிப்பு:1995.

SEMESTER – II
LANGUAGE 2 : ENGLISH – 2

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 3: ANALYTICAL GEOMETRY

Subject Code: 16U2MCCT03

Total Hrs:75

No. of Credits: 5

Objectives:

- To understand about straight lines in three dimensional.
- To have knowledge about Sphere, Cone and Cylinder.
- To learn about conicoides in Solid Geometry

UNIT I**(15 Hrs)**

The straight line - Symmetrical form of the equations of a line – Non- symmetrical form of the equations of a line – equation of a line passing through two points – Coplanar lines: Condition for the given two lines should be coplanar – Shortest distance between two skew lines.

UNIT II**(18 Hrs)**

Sphere - Equations of a sphere when the centre and radius are given – The equation always $x^2+y^2+z^2+2ux+2vy+2wz+d=0$ always represents a sphere and to find its centre and radius – the length of the tangent from the point (x_1,y_1,z_1) to the sphere $x^2+y^2+z^2+2ux+2vy+2wz+d=0$ Equation of a sphere passing through a given circle – intersection of two spheres is a circle – the Equation of the tangent plane to the sphere $x^2+y^2+z^2+2ux+2vy+2wz+d=0$ at the point (x_1,y_1,z_1) .

UNIT III**(12 Hrs)**

Cone - Definition – Right Circular Cone – Definition – Derivation of Right circular cone

UNIT IV**(18 Hrs)**

Cylinder - Definition – Equation of the right circular cylinder with axis and radius of the guiding circle – Enveloping cylinder – equation of the enveloping cylinder of the surface $ax^2+by^2+cz^2=1$ having the generator parallel to $\frac{x}{l}=\frac{y}{m}=\frac{z}{n}$ -simple problems.

UNIT V**(12 Hrs)**

Central Quadrics - Definition and three cases – intersection of a line and quadric – tangents and tangent plane – condition for the plane $lx+my+nz=pt$ to touch the conicoid $ax^2+by^2+cz^2=1$ Normal at the point (x_1,y_1,z_1) to the conicoid $ax^2+by^2+cz^2=1$

Text Book:

T.Manicavachagam pillai , Natarajan : A text book of Analytical geometry of 3D - S.Vishwanathan Pvt Ltd, 2002.

Unit I	:	Chapter-3	Sections – 1 to 7, 8,8.1, 8.2
Unit II	:	Chapter-4	Sections – 1 to 8
Unit III	:	Chapter-5	Sections – 1 to 7
Unit IV	:	Chapter-5	Sections – 8.1, 8.2, 9.3
Unit V	:	Chapter-5	Sections – 9 to 13

Reference Books :

- P.Duraipandian, Laxmi Duraipandian, D.Muhilan : Analytical Geometry 3 Dimensional, Emerald Publishers, Reprint- 2004.*
- P.Duraipandian and Kayalal Pachaiyappa : Analytical Geometry (3-D), Muhil Publishers, Revised edition - 2009.*
- M.L. Khanna : Solid Geometry – Jainath & Co Publishers, Meerut – 2000.*
- Shanthi Narayanan, P.K. Mittal : Analytical Solid Geometry – S. Chand & Co – 2004.*

SEMESTER II**CORE 4 : PROGRAMMING IN C (THEORY)****Subject Code: 16U2MCCT04****Total Hrs:60****No. of Credits :4****Objectives:**

- To understand the basics of C Programming and its various computation logics.
- To know the concepts of decision making and branching with various statements
- To get exposure with arrays, strings and functions with its various operations

UNIT I (12 Hrs)

Introduction –Structure of C programme - Character set -Constants – Keywords and identifiers – Variables - Data types – Declaration of variables –Assigning values to variables – Defining symbolic constants.

UNIT II (12 Hrs)

Arithmetic operators - Relational operators - logical operators – assignment operators – increment and decrement operates –Conditional operators – Special operators –Arithmetic expressions –Evaluation of expressions –Precedence of arithmetic operators –Type conversion in expressions – operator precedence and associating mathematical functions.

UNIT III (12 Hrs)

Formatted input and output- Decision making with IF statement – Simple IF statement – The if ELSE statement - Nesting of IF.....ELSE statement – The ELSE IF ladder. The Switch statement – The Operator –The GOTO statement.

UNIT IV (12 Hrs)

The WHILE statement - the DO statement the FOR statement –Jumps in loops.One, Two dimensional arrays – Initiating two dimensional arrays – Multidimensional arrays –Declaring and initializing string variables –reading strings from terminal – Writing strings on the screen – Arithmetic operations on characters.

UNIT V (12 Hrs)

User defined function: Introduction-Need and Element of user defined function-Definition-Return value and their types-function call – declaration – category of functions-Nesting of function-Recursion.

Text Book:

E.Balagurusamy:Programming in ANSI C,Tata McGraw–Hill Publishers, 5th edition-2011

Unit I : Chapter - 1 Section - 1.8, Chapter - 2 Section -2.1 – 2.11.

Unit II : Chapter - 3 Section - 3.1- 3.7, 3.9 - 3.12, 3.14 - 3.16.

Unit III : Chapter - 4 Section - 4.4, 4.5, Chapter - 5 Section - 5.1 – 5.9.

Unit IV : Chapter- 6 Section - 6.1 - 6.6, Chapter -7 Section- 7.1 – 7.7
Chapter - 8 Sec - 8.1 – 8.5.

Unit V : Chapter -9 Section -9.1 – 9.16.

Reference Books:

1. *Byron Gottfried : Programming with C (Schaum's outline series) -Tata McGrawHill publishing company -2000.*
2. *Ashok N.Kamthane : Programming with Ansi and Turbo C, Pearson Education publishers, -2002*
3. *K.R.Venugopal and Sudeep R Prasad : Programming with C- Tata McGraw–Hill Publishing company limited, New Delhi-2001*
4. *Yashavant Kanethkar : Let us C - BPB Publication New Delhi - 1999 .*

SEMESTER II**CORE 4 : PROGRAMMING IN C (PRACTICAL)****Subject Code: 16U2MCCP05****Total Hrs:45****No. of Credits:2****PROGRAMMING IN C- PRACTICAL LIST**

1. Write a C program to generate 'N' Fibonacci number.

2. Write a C program to print all possible roots for a given quadratic equation.
3. Write a C program to calculate the statistical values of mean, median, mode, Standard Deviation and variance of the given data.
4. Write a C program to sort a set of numbers.
5. Write a C program to sort the given set of names.
6. Write a C program to find factorial value of a given number 'N' using recursive function call.
7. Write a C program to find the product of two given matrix.
8. Write a C program to prepare pay list for a given data.

SEMESTER II
ALLIED 2: MATHEMATICAL STATISTICS - II

Subject Code:16U2MCAT02

Total Hrs:90

No. of Credits:4

Objectives:

- To understand concepts of Sampling and Test of Significance,
- To learn the concepts of Theory of Estimation and Testing Hypothesis

- To gain knowledge about ANOVA and Design of Experiments

UNIT I**(20 Hrs)**

Sampling – Introduction – Types – Parameters and statistic – Test of Significance – Null Hypothesis – Errors in Sampling – Critical Region and Level of Significance – Tests of Significance for Large samples – Sampling of Attributes – Sampling of Variables – Unbiased Estimates for Population Mean and Variance – Standard Error of Sample Mean – Test of Significance for Single Mean – Tests of Significance for large and small samples with respect to mean and proportions – Test for association between attributes.

UNIT II**(15 Hrs)**

Theory of Estimation - Introduction – Characteristics of Estimators – Consistency Unbiasedness – Efficient Estimators – Sufficiency - Methods of estimation – Maximum likelihood Rao – Cramer Inequality.

UNIT III**(20 Hrs)**

Test of Hypothesis - Introduction – Statistical Hypothesis – Simple and Composite – Steps in Solving Testing of Hypothesis problem – Optimum Test under Different Situations – Heyman J and Pearson, E.S.Lemma

UNIT IV**(20 Hrs)**

Sampling - Sampling from finite population – Simple Random Sampling – Stratified Random Sampling and Systematic Sampling – Estimation of Mean, Total and their standard errors. Sampling and Non - sampling errors (Concepts only).

Analysis of Variance - One way classifications – Two way classifications. Fundamental principles of experimentation: CRD – RBD and LSD.

UNIT V**(15 Hrs)**

Problems related to **Unit-I** and **Unit-IV** only.

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

Text Book:

S.C.Gupta & V.K.Kapoor: Elements of Mathematical Statistics Sultan Chand & Sons.-2010

Unit I : Chapter 12

Unit II: Chapter 15

Unit III : Chapter 16

Unit IV : Chapter 17, Chapter 18– Section 18.3, 18.5-18.7 Chapter 19– Section 19.3, 19.7 – 19.9

Reference Books:

1. Gupta, C.B and Vijay Gupta : Introduction to Statistical Methods, Vikas Publications-2008 .
2. Gupta, S.C. & Kapoor. V.K : Fundamentals of Applied Statistics,-Sultan Chand and Sons -2004
3. D.C. Sanchetti, V.K. Kapoor : Statistics, Sultan Chand and Sons –2007.
4. R.S.N. Pillai, V. Bagavathi : Statistics , S. Chand and Co – 2001.

Semester II

மதிப்பீட்டுக் கல்வி - அறவியலும் பண்பாடும்

Value Based Education II:

Ethics and Culture (மனிதவள மாண்பு - தனிமனித விழுமியங்கள் , சமுதாய விழுமியங்கள்)

Subject Code: 16U2CCVE2
நோக்கம்

Total Hrs: 2

No. of Credits: 2

- ஒவ்வொருவரும் தன்னை உயர்த்திக் கொண்டு, சமுதாய மக்களுடன் இணக்கமாக வாழ்ந்து சமுதாயத்தையும் உயர்த்த வேண்டும். உன்னத இலட்சியத்திற்காக வாழ்ந்து நமது வாழ்க்கையை அர்த்தமுள்ளதாக ஆக்கிக் கொள்ள வேண்டும்.
- குவலைக்கு ஆதாரமான ஆசை மற்றும் சினம் ஆகியவற்றைத் தவிர்ப்பதன் மூலம் கவலையை ஒழிப்பதற்கான பயிற்சி பெறுதல்
- கல்வி, அரசியல், பொருளாதாரம் மற்றும் விஞ்ஞானம் ஆகியவற்றுக்கும் சமுதாயத்திற்கும் உள்ள தொடர்பினை அறிந்து கொள்ளுதல்

அலகு - 1**(5 மணிநேரம்)**

மனிதவள மாண்பின் அவசியம் - குறிக்கோள் , மதிப்புகள் - வாழ்வின் நோக்கமும் தத்துவமும் - வாழ்க்கைத் தேவைகள் , காப்புகள் - அறநெறிகள் , அறிவின் நிலைப்பாடுகள்.

அலகு - 2**(5 மணிநேரம்)**

எண்ணம் ஆராய்தல் - எண்ணம் எழக்காரணங்கள் - எண்ணம் ஆராய்தல் பயிற்சி - ஆசை சீரமைத்தல் - ஆசை சீரமைத்தல் பயிற்சி.

அலகு - 3**(5 மணிநேரம்)**

சினம் தவிர்த்தல் - சினத்தின் விளைவுகள் - சினம் தவிர்த்தல் பயிற்சி - கவலை ஒழித்தல் - கவலையின் வகைகளும் விளைவுகளும் - கவலை ஒழித்தலுக்கான பயிற்சி.

அலகு - 4**(8 மணிநேரம்)**

மனிதனின் பரிணாமம் - பிரபஞ்ச தன்மாற்றம் - உயிரினத் தன்மாற்றம் - ஆறாம் அறிவின் மேம்பாடு - மனித வேறுபாட்டிற்கான காரணங்கள் - ஏழு சம்பத்துகள் - பதினாறு காரணங்கள் - மனத் தூய்மை தரும் சமுதாய நலன் , அறவாழ்வு - கருமையத்தின் சிறப்பியல்புகள் - பாவப்பதிவுகளும் , போக்கும் வழிகளும்.

அலகு - 5**(7 மணிநேரம்)**

கல்வியும் சமுதாயமும் - கல்வியின் சமுதாய நோக்கங்கள் - கல்வியின் சமுதாயப் பணிகள் - அரசியலும் சமுதாயமும் - பொருளாதாரமும் சமுதாயமும் - விஞ்ஞானமும் சமுதாயமும் - அறிவியலும் ஆன்மிகமும்.

பாட நூல்கள்:

1. தனிமனித விழுமியங்கள், மனிதவள மாண்புக் கல்விக்கான தனி வெளியீடு, என்.ஜி.எம். கல்லூரி, பொள்ளாச்சி. 2015.
2. சமுதாய விழுமியங்கள், மனிதவள மாண்புக் கல்விக்கான தனி வெளியீடு, என்.ஜி.எம். கல்லூரி, பொள்ளாச்சி. 2014.

பார்வை நூல்கள்:

1. வாழ்வியல் விழுமியங்கள், வேதாத்திரி பதிப்பகம் , ஈரோடு. பதினொன்றாம் பதிப்பு: 2013

2. மனவளக்கலை யோகா, உலக சமுதாய சேவா சங்கம் , வேதாத்திரி பதிப்பகம் ,
பொள்ளாச்சி. பதினொன்றாம் பதிப்பு: ஜூலை – 2015.

SEMESTER III

CORE 6: TRIGONOMETRY , VECTOR CALCULUS & FOURIER SERIES

Subject Code: 16U3MCCT06

Total Hrs:90

No. of Credits :5

Objectives:

- To gain the knowledge about Series of sine ,cosine and Logarithmic series.
- To understand the Concepts of Divergence and Curl and Problem solving
- To evaluate Line ,surface and Volume Integrals using Gauss, Green , Stokes theorem

UNIT I**(20 HRS)**

Expansion of $\cos n\theta$, $\sin n\theta$, $\cos^n \theta$ and $\sin^n \theta$ in powers of $\sin \theta$ and $\cos \theta$ - Separation of real and imaginary parts of $\sin(\alpha+i\beta)$, $\cos(\alpha+i\beta)$, $\tan(\alpha+i\beta)$.

UNIT II**(15 HRS)**

Logarithm of a complex numbers-Summation of Trigonometric Series.

UNIT III**(20 HRS)**

Scalar and Vector point functions-Differentiation of vectors-Differentiation operators-Directional derivatives, gradient, Divergence, Curl.

UNIT IV**(20 HRS)**

Integration for vectors: Surface and Volume Integrals, Theorems of Gauss, Green, Stokes (Statements only)-Problems.

UNIT V**(15 HRS)**

Fourier Series: Definition-Finding Fourier coefficients for a given periods function with period 2π -Odd and Even Functions.

Text Books:

1. S.Narayanan and T.K.Manickavasagam pillay: *Trigonometry for B.Sc Mathematics (Major)*, S.Viswanathan Publishers-2004. **(Unit I and Unit II)**
2. P.Durai pandiyan , Kayalal Pachaiyappa: *Vector calculus*, Muhil Publishers-2009. **(Unit III and Unit IV)**
3. P.Kandasamy, K.Thilagavathy : *Mathematics, Volume IV (Vector Calculus, Fourier series)*, S.Chand&Co-2009. **(Unit V)**

Unit I : Chapter 3-Section 1, 4-4.1 , Chapter 4-Section 2, 2.1, 2.2

Unit II : Chapter 5- Section 5 , Chapter 6-Section 1, 2, 3

Unit III : Chapter 1 and 2

Unit IV : Chapter 3

Unit V : Chapter 1 (Fourier Series and its Application)

Reference Books:

1. P.R.Vittal : *Trigonometry*, Margham Publications, 3rd edition-2004.
2. Durai Pandian, Laxmi Durai Pandian: *Vector Analysis*, Emerald Publishers-2004.
3. S.Narayanan, T.K.Manickavachagom Pillai: *Calculus volume-III (Differential Equations & Fourier Series and Fourier Transforms)*, Viswanathan Printers-2004.

SEMESTER III**CORE 7 : STATICS****Subject Code: 16U3MCCT07****Total Hrs: 90****No. of Credits: 4****Objectives:**

- To enable the student to understand nature of forces and resultant of forces
- To make the student realize the concept of Parallel forces, Moments and Couples
- To gain knowledge about reduction of Coplanar forces and its applications

UNIT I**(20Hrs)**

Forces acting at a Point- Parallelogram law of forces (Statement and Proof)-Problems - Triangle law of forces (Statement and Proof)--Converse –Polygon law of forces.

UNIT II**(15Hrs)**

Lami's Theorem (Statement and Proof)- Problems- - (λ, μ) Theorem (Statement and Proof) - Problems- Resultant of any number of forces acting at a Point-Conditions of Equilibrium

UNIT III**(15Hrs)**

Parallel forces -Resultant of two like Parallel forces-Resultant of two unlike and unequal Parallel forces-Conditions of Equilibrium of three Coplanar forces- problems. Moments- Couples-Equilibrium of two Couples- Resultant of a Couple and a force -Problems.

UNIT IV**(20Hrs)**

Varignon's Theorem of Moments-Generalised theorem on Moments-Problems-Equilibrium of three forces acting on rigid body- Three coplanar forces Theorem-problems

UNIT V**(20 Hrs)**

Coplanar forces-Reduction of any number of Coplanar forces theorem(without Proof) – Conditions for a system of forces reduce to a single force or to a couple -Equation to the line of action of the resultant-problems

Text Book:

M.K .Venkataraman : Statics – Agasthiar Publications, Trichy , 2010.

Unit I : Chapter - 2 Section-1 to 8 .

Unit II : Chapter - 2 Section - 9 to 10 Chapter - 2 Section -14 to 16.

Unit III : Chapter - 3 Section -1 to 11 Chapter - 4 Section - 1 to 10

Unit IV : Chapter - 3 Section -12&13 Chapter- 5 Section-1 to5 (Page No.98 to110)

Unit V : Chapter - 6 Section -1 to 8 (Page No.143 to 167)

Reference Books:

1.A.V.Dharmapadam : Statics - S. Viswanathan printers and Publishing Ltd, 1993.

2.P.Duraipandian &Laxmi Duraipandian:Mechanics- S.Chand andCompany Ltd, New Delhi- 1985.

3. Dr.P.P.Gupta : Statics – Kedal Nath Ram Nath . Meerut- 1984

SEMESTER III**Core 8: PROGRAMMING IN C++****Subject Code: 16U3MCCT08****Total Hrs: 75****No. of Credits: 4****Objectives:**

- To understand basic data types and operators in C++.
- To know the functions in C++ and classes.
- To learn the concept of operator overloading, Inheritance and file handling.

UNIT I**(18 HRS)**

Evolution of C++ - Applications of C++ - Structure of C++ program- Tokens-Keywords- Identifiers and constants-Basic data types-User-defined data types-Constant pointers and pointers to constants-Symbolic constants-Type compatibility-Declaration of variables-Dynamic initialization of

variables-Reference variables-operators in C++ - Scope resolution operator – Memory management operators-Manipulators-Type cast operator-expressions and their types- Special assignment expressions-Implicit conversions-Operator precedence.

UNIT II**(15 HRS)**

Functions in C++ - The main function-function prototyping-call by reference-return by reference-inline functions-default arguments-const arguments-function overloading. Managing console I/O operations:C++ streams – C++ stream classes-unformatted console I/O operations-formatted console I/O operations-Managing output with manipulators.

UNIT III**(15 HRS)**

Classes and Objectives- Specifying a class-Defining member functions-making an outside function inline-nesting of member functions-private member functions-arrays within a class-memory allocation for objects-arrays of objects-objects as function arguments-friend functions-objects-const member functions. Constructors and destructors: Introduction-Constructors – parameterized constructors-multiple constructors in a class-constructors with default arguments-copy constructor.

UNIT IV**(15 HRS)**

Operator Overloading - Introduction-defining operator overloading-overloading unary operators –overloading binary operators-overloading binary operators using friends-rules for overloading operators. Inheritance- Introduction-defining derived classes-single inheritance-making a private member inheritable-multilevel inheritance-multiple inheritance-heirarchical inheritance-hybrid inheritance.

UNIT V**(12 HRS)**

Working with files: Introduction-Classes for file stream operations-Opening and closing a file-detecting end of file-More about open(): File Modes-File pointers and their manipulations-Sequential input and output operations-Updating a file- Random access.

Text Book:

E.Balagurusamy: Object Oriented programming with C++, McGraw Hill Publications,4th Edition.

Unit I : Chapter 2 Sec 2.1, 2.2, 2.6, Chapter 3: Sec 3.1-3.14, 3.16 – 3.23

Unit II : Chapter 4 Sec 4.1 – 4.9, Chapter 10: Sec 10.1 – 10.6

Unit III : Chapter 5 Sec 5.3 – 5.10, 5.13 – 5.17, Chapter 6 Sec 6.1 – 6.5,6.7

Unit IV : Chapter 7 Sec 7.1 – 7.5, 7.7, Chapter 8 Sec 8.1 – 8.8

Unit V : Chapter 11 Sec 11.1 - 11.8

Reference Books:

1.*Robert Lafore :Object oriented programming in Turbo C++, Galgotia publications-1994.*

2.*Bjarne Stroutstrup:The C++ programming language,Addision Wesley, 2nd Edition- 1991.*

3. *D.Ravi Chandran: Programming with C++, Tata McGraw-Hill publishing company limited, New Delhi-1996.*

4.*Ashok N.Kamthane:Object Oriented Programming with ANSI and Turbo C++, Pearson Education Publishers-2003.*

5.*John R.Hubbard:Programming with C++, TMH publishers,2nd edition,2002.*

SEMESTER III**CORE 9 : PROGRAMMING IN C++ (PRACTICAL)****Subject Code: 16U3MCCP09****Total Hrs:45****No. of Credits:2****PROGRAMMING IN C++ PRACTICAL LIST**

1. Write a function 'power()' to raise a number 'm' to a power 'n'. The function takes a 'double' value for 'm' and 'int' value for 'n', and returns the result correctly. Use a default value of 2 for 'n' to make the function to calculate squares when this argument is omitted. Write a 'main()' that gets the values of 'm' and 'n' from the user to test the function.

2. Write a program to compute compound interest of a given amount AMT for 'n' years. Use function overloading so that the program gets input of interest rate RATE in any of the data type 'float' or 'int'.
3. Create a class which consist of employee detail ENO, ENAME, DEPT, BASIC SALARY. 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 and display the payslip in a neat format using console I/O.
4. Define two classes POLAR and RECTANGLE to represent points in the polar and rectangle system. Write a program to convert from one system to another.
5. Create a class FLOAT that contains one float data member. Overload all the four arithmetic operators so that they operate on the objects of FLOAT.

SEMESTER III

ALLIED 3: ACCOUNTANCY-I

Subject Code: 16U3MCAT03

Total Hrs:105

No. of Credits: 4

Objectives:

To make the students understand the basic accounting concept and conventions.

To know clearly about the accounting for final accounts of both profit and non-profit organisation

To know clearly about the Accounting for Joint venture and Consignments.

UNIT –I

(21 Hours)

Fundamentals of Book Keeping – Accounting Concepts and Conventions – Journal – Ledger – Subsidiary books – Trial balance.

UNIT – II (21 Hours)

Final accounts of a sole trader with adjustments – Errors and rectification

UNIT – III (21 Hours)

Non Trading Concern - Bill of exchange – Average due date – Account current.

UNIT – IV (21 Hours)

Accounting for consignments and Joint ventures

UNIT – V (21 Hours)

Bank Reconciliation statement

(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 & Company Limited, Reprint 2010.

Reference Books:

1. T.S. Grewal : Introduction to Accountancy - S. Chand & Company Limited, 8th revised Edition 2013.
2. Jain & Narang : Advanced Accountancy - Kalyani publishers, 17th revised edition, 2011.
3. R.S.N. Pillai & Bhagavathy : Introduction to Accountancy - S. Chand & Company Limited, 8th revised, Edition 2013.

SEMESTER – III

NON MAJOR ELECTIVE 1 : FOOD SCIENCE AND NUTRITION

Subject Code: 16U3NMET01

Total Hrs: 30

No. of Credits: 2

Objectives

- To understand the importance of Nutrition and the role of food in health.
- To know about the functions, deficiency and toxicity of nutrients.
- To understand Malnutrition and its prevention
- To know about various adulterants in food and the methods of detecting them.
- 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 and sources, 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 Books:

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**Common to all the Branches of UG Courses****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 Calander 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**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.)

SEMESTER IV

CORE 10: DIFFERENTIAL EQUATIONS & LAPLACE TRANSFORMS

Subject Code: 16U4MCCT10

Total Hrs:90

No. of Credits :5

Objectives:

- To make the students to solve ordinary differential Equations of First order, second order and partial Differential Equations
- To gain knowledge about Laplace Transforms and problem solving.

- To understand the Inverse Laplace Transforms and its applications.

UNIT I (17 HRS)

Ordinary Differential Equations: Equations of First order and of Degree higher than one- Solvable for p, for x, for y- Clairauts equation.

UNIT II (20 HRS)

Solving the linear differential equations of the form $(aD^3 + bD^2 + cD + d)y = x$, where a, b, c, d are constants & x is of the form e^{mx} , $\cos mx$, $\sin mx$, x , x^2 , $x e^{mx}$, $x \sin mx$, $x^2 \sin mx$, $e^{mx} \sin nx$, $e^{mx} \cos nx$.

UNIT III (20 HRS)

Partial Differential Equations- Formation of equations by eliminating arbitrary constants and arbitrary functions- Solutions of PDE in Standard types I & II- Lagrange's linear equations.

UNIT IV (16 HRS)

Laplace Transforms- Definition- Laplace transforms of Standard functions- Linearity property- First shifting theorem.

UNIT V (17 HRS)

Inverse Laplace Transforms- Applications to solutions of First order and second order Differential Equations with constant coefficients.

Text Book:

Kandasamy, P., Thilagavathi, K.: 'Mathematics for B.Sc-Branch-I volume-III, S.Chand & Co-2004.

- Unit I** : Chapter 1 (ODE)
Unit II : Chapter 2 (ODE)
Unit III : Chapter 1 1.1-1.5, 1.9, 1.10, 1.11 (PDE)
Unit IV & V : Chapter 1 (Laplace Transform)

Reference Books:

- S.Narayanan, T.K.Manickavachagom Pillai: Calculus volume-III (Differential Equations & Fourier Series and Fourier Transforms)-Viswanathan Printers-2004*
- N.P.Bali: Differential equations, Laxmi Publications -2004.*
- Venkatasubramanian N.K, Sunderan V, Lakshmi Narayanan K.A & Balasubramanian: Engineering Mathematics, JJ Publications -1999.*
- Dr.M.K.Venkataraman, Mrs.Manorama Sridhar: Differential Equations and Laplace Transforms, The National Publishing Co-2004.*

SEMESTER IV

CORE 11 : DYNAMICS

Subject Code: 16U4MCCT11**Total Hrs: 90****No. of Credits: 4****Objectives:**

- To understand concepts of Kinematics and Projectile motion of Particles,
- To learn about radial and transverse components in central orbit
- To gain knowledge about Simple Harmonic motion and its applications
- To expose with the students about the collision of bodies and Loss of Kinetic energy

UNIT I (20Hrs)

Projectiles- Path of a Projectile- Characteristics of the motion of a projectile-problem- Maximum horizontal range of Projectile-Range on an inclined plane-Greatest distance of the projectile from the inclined plane-Maximum range on the inclined plane-problems

UNIT II (15 Hrs)

Central orbits-Radial and Transverse components of Velocity and Acceleration-Problems-Differential Equation of central orbit- perpendicular from pole on the tangent -Pedal Equation of the central orbit-Areal Velocity-Problems

UNIT III (20Hrs)

Simple Harmonic Motion- Simple Harmonic motion in a straight line -Amplitude, Periodic time -General solution of SHM-problems- -Phase and Epoch-Composition of two simple Harmonic motion of the same Period in the same straight line and in two perpendicular directions.

UNIT IV (15Hrs)

Collision of Elastic bodies-Fundamental laws of impact-Impact of a smooth sphere on a fixed smooth plane-Problems-Direct Impact of two smooth spheres - Oblique Impact of two smooth spheres-problems.

UNIT V (20 Hrs)

Loss of Kinetic energy due to direct impact of two smooth spheres- Loss of Kinetic energy due to oblique impact of two smooth spheres-Problems

Text Book:

M.K .Venkataraman : Dynamics – Agastiar Publications, Trichy , 1994.

Unit I : Chapter- 6 Section 6.1 – 6.8 , Chapter- 6 Section 6.12 - 6.15

Unit II : Chapter -11 Section 11.1-11.10

Unit III : Chapter- 10 Section 10.1-10.7,

Unit IV : Chapter- 8 Section 8.1- 8.5, 8.7

Unit V : Chapter- 8 Section 8.6 and 8.8

Reference Books:

1.A.V.Dharmapadam : Dynamics - S. Viswanathan printers and Publishing Ltd, 1998.

2.K .Viswanatha Naik and M.S Kasi : Dynamics- Emerald publishers – 1992.

3.Narayanamurthi : Dynamics – National Publishers, New Delhi – 1991.

SEMESTER IV**CORE 12 : DATA STRUCTURES USING C++****Subject Code:16U4MCCT12****Total Hrs: 75****No. of Credits: 4****Objectives:**

- To know the basic concepts of data structures.
- To learn the concept of arrays, stack operations and linked lists.
- To know about the basic concepts of graphs and trees.

UNIT I (15 HRS)

Data Structures:Definition of a Data structure-primitive and composite Data Types, Arrays.

UNIT II**(15 HRS)**

Stacks-Operations on stack-Applications of stack- Expression- Queues-Circular Queue- Operations on Queues- Queue Applications.

UNIT III**(15 HRS)**

Singly Linked List-Operations- Polynomial Addition: Doubly Linked List-Operations.

UNIT IV**(15 HRS)**

Trees:Binary Trees-definitions-Binary Search tree- Operations.

UNIT V**(15 HRS)**

Graph – Definition-Graph traversal. Hashing Tables and Hashing Functions.

Text Book:

E.Horowitz and S.Shani:Fundamentals of Data Structures in C++, Galgotia publication- 1999.

Unit I : Chapter 2 Sec 2.1, 2.2, 2.3, 2.5

Unit II : Chapter 3 Sec 3.2, 3.3, 3.6

Unit III : Chapter 4 Sec 4.1, 4.2, 4.2.1, 4.7,4.7.1, 4.7.2, 4.10, 4.11, 4.11.1

Unit IV : Chapter 5 Sec 5.2, 5.2.1, 5.2.2, 5.2.7

Unit V : Chapter 6 Sec 6.1, 6.2, 6.2.1, 6.2.2, 6.2.3

Reference Books:

1. R.Kruse C.L. Tondo and B.Leung: Data Structures and Program design in C, PHI- 1997
2. Cangsam,Augenstein, Tenenbaum:Data Structures using C & C++,PHI.
- 3.D.Samantha:Classic Data Structures, PHI, New Delhi- 2005.

SEMESTER IV

CORE 13 : DATA STRUCTURES USING C++ - PRACTICAL

Subject Code: 16U4MCCP13**Total Hrs: 45****No. of Credits: 2**

DATA STRUCTURES USING C++ - PRACTICAL LIST

- 1.Implement PUSH, POP operations of stack using Arrays.

2. Write a program using Heap sort method.
3. Implement add, delete operations of a queue using Arrays.
4. Write a program to do binary search.
5. Addition of two polynomials using Arrays.
6. Depth first search and Breadth first search for graphs using Recursion.

SEMESTER IV

ALLIED 4: ACCOUNTANCY-II

Subject Code: 16U4MCAT04

Total Hrs:105

No. of Credits: 4

Objectives:

5. To know about the methods of calculating depreciation
6. To know about the Single entry system, Conversion of small firms into company accounts etc.,
7. To make the students to understand the concept of partnership accounts and dissolution etc.,

UNIT – I **(21 Hours)**

Depreciation – Methods of Depreciation: Straight Line Method - Written Down Value Method – Sinking Fund Method – Annuity Method – Insurance Policy Method.

Unit – II **(21 Hours)**

Single Entry System – Meaning – Features – Statement of Affairs Method and Conversion Method

Unit – III **(21 Hours)**

Departmental accounts-Branch accounts excluding Foreign Branches.

Unit – IV **(21 Hours)**

Hire purchase and installment System excluding Hire purchase Trading account.

Unit – V **(21 Hours)**

Royalties - Minimum Rent – Short Working – Recoupment – Strike Period (excluding Sub-lease)

(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 & Company Limited, Reprint 2010.

Reference Books:

1. T.S. Grewal : Introduction to Accountancy - S. Chand & Company Limited,8th revised Edition 2013.
2. Jain & Narang : Advanced Accountancy - Kalyani publishers,17th revised edition,2011.
3. R.S.N. Pillai & Bhagavathy : Introduction to Accountancy - S. Chand & Company Limited, 8th revised, Edition 2013.

SEMESTER – IV

NON MAJOR ELECTIVE 2 : FLORICULTURE

Subject Code: 16U4NMET02

Total Hrs: 30

No. of Credits: 2

Objectives:

- To learn about the cultivation of flowers and ornamental crops from the time of planting to the time of harvesting.
- 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.
- To learn the basics of growing and fertilizing plants and flowers.
- 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**Common to all the Branches of UG Courses****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 cistern – Probability - 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 Interest-Compound Interest -Logical 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

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

SEMESTER V

CORE 14: REAL ANALYSIS

Subject Code:16U5MCCT14

Total Hrs: 90

No. of Credits: 5

Objectives:

- To know about Real number systems, Inequalities, Collections of countable sets, Covering and Basic topology in metric spaces.
- To Know about convergent, Cauchy, Continuous functions, Bolzan's theorem and Concept of derivative and properties of derivative
- To know about Riemann and Riemann Stieltjes integral and properties.

UNIT I**(18 HRS)**

Least upper bound- greatest lower bound- the Cauchy schwartz inequalities – countable and uncountable sets – uncountability of the real number systems – Set Algebra – Countable collections of countable sets-Elements of point set topology- Euclidean space R^n - Open balls and open sets in R^n . The structure of open sets in R^n -closed and adherent points – The Bolzano – Weierstrass theorem - the Cantor intersection Theorem.

UNIT II**(17 HRS)**

Covering – Lindelof covering theorem – the Heine Borel covering theorem – Compactness in R^n - Metric Spaces – Point set topology in metric spaces – compact subsets of a metric space – Boundary of a set.

UNIT III**(18 HRS)**

Convergent sequences in a metric space – Cauchy sequences – Completeness sequences – Complete metric spaces. Limit of a function – Continuous function – Continuity of composite functions – Continuity and inverse images of open or closed sets – functions continuous on compact sets – topological mappings – Bolzano's Theorem.

UNIT IV**(20 HRS)**

Definition of derivative – Derivative and continuity - Algebra of derivatives – Roll's theorem – The mean value theorem for derivatives – Taylor's formula with remainder. Properties of monotone functions – functions bounded variation – total variation – additive properties of total variation on $[a,x]$ as a function of bounded variation expressed as the difference of increasing functions – Continuous functions of bounded variation.

UNIT V**(17 HRS)**

The Riemann – Stieltjes integral- Introduction - Notation – The definition of Riemann – Stieltjes integral – linear properties – Integration by parts – change of variable in a Riemann – Stieltjes integral – Reduction to a Riemann integral.

Text Book:

Tom.M.Apostol : Mathematical Analysis,Addison – Wisely, Narosa publishing company, Chennai, 2nd Edition-1990.

Unit I :Chapter 1 Sec:1.10 – 1.13, 1.19,Chapter 2 Sec: 2.12 – 2.15 ,Chapter 3 Sec:3.1 – 3.9

Unit II :Chapter 3 Sec: 3.10 – 3.16

Unit III :Chapter 4 Sec: 4.2 – 4.5, 4.8 – 4.15

Unit IV :Chapter 5 Sec: 5.2 – 5.4, 5.9 – 5.12, Chapter 6 Sec: 6.2 – 6.8

Unit V :Chapter 7 Sec: 7.1 – 7.7

Reference Books:

1. *R.R.Goldberg:Methods of Real Analysis, NY, John Wiley, New York-1976.*

2. *G.F.Simmons:Introduction to Topology and Modern Analysis, McGraw – Hill, New York-1963.*

3. *G.Birkhoff and MacLane:A Survey of Modern Algebra, Third Edition, Macmillian NewYork-1965.*

4.*J.N.Sharma and A.R.Vasistha: Real Analysis, Krishna Prakashan Media (P) Ltd-1997.*

SEMESTER V**CORE 15: MODERN ALGEBRA****Subject Code:16U5MCCT15****Total Hrs: 90****No. of Credits: 5****Objectives:**

- To understand the concepts of Groups, Subgroups, Normal Subgroups and problem solving.
- To get expose with Homomorphism, Automorphism of Groups
- To learn about rings, ideals, Integral domain and Field of Quotients

UNIT I**(18 HRS)**

Sets – Mappings – Relations and binary operations – Groups: Abelian group, Symmetric group Definitions and Examples – Basic properties.

UNIT II**(18 HRS)**

Subgroups – Cyclic subgroup – Index of a group – order of an element - Fermat theorem – A Counting Principle – Normal Subgroup and Quotient Groups.

UNIT III**(18 HRS)**

Homomorphisms – Cauchy's theorem for Abelian groups – Sylow's theorem for Abelian groups Automorphisms – Inner automorphism – Cayley's theorem, permutation groups.

UNIT IV**(18 HRS)**

Rings: Definition and Examples – Some special Classes of Rings – Commutative ring – Field – Integral domain – Homomorphisms of Rings.

UNIT V**(18 HRS)**

Ideals and Quotient Rings – More Ideals and Quotient Rings – Maximal ideal – The field of Quotients of an Integral Domain

Text Book:

N.Herstein: Topics in Algebra, John Wiley & Sons, New York-2003.

Unit I : Chapter 1: sec 1.1 – 1.3, Chapter 2: sec 2.1 – 2.3

Unit II : Chapter 2: sec 2.4 – 2.6

Unit III : Chapter 2: sec 2.7 – 2.10

Unit IV : Chapter 3: sec 3.1 – 3.3

Unit V : Chapter 3: sec 3.4 – 3.6

Reference Books:

1. S.Arumugam, A.T. Issac: *Modern Algebra*, Scitech Publications – 2005.
2. Surjeet singh, Qazi zameeruddin: *Modern Algebra*, Vikas Publishing house - 1992.
3. A.R. Vasishtha: *Modern Algebra*, Krishna prakashan Mandir, Meerut, 1994-95.

SEMESTER V**CORE 16: VISUAL BASIC****Subject Code:16U5MCCT16****Total Hrs: 75****No. of Credits: 4****Objectives:**

- To Know about VB and Fundamentals, Logical operators.
- To Know about Drop down Menus, Error Handlers
- To Know about Dynamic arrays and Data files, Binary files.

UNIT I**(15 HRS)**

Introduction to VB-Event and Event procedure-Object related concept-VB program development process-Components-VB environment-saving and running-Number Constants-String Variables - VB fundamentals-constants-variables-operators-library functions.

UNIT II**(15 HRS)**

Branching and looping-logical operators- If-then, if-then-else, Select case-For next, Do loop. While-wend, Stop-VB control functions-Forms and controls.

Unit III**(15 HRS)**

Menus and dialog boxes:Building drop down menus, Accessing menu-sub menus-Popup menus-dialog boxes.
Executing and debugging a new project-Errors-error handlers.

UNIT IV**(15 HRS)**

Procedures:Modulus and procedures-sub procedures-Event procedures-Function procedures. Arrays: Characteristics -Declarations-Dynamic Arrays-Control Arrays.

UNIT V**(15 HRS)**

Data files: Characteristics-Accessing and saving a file in VB-Processing-Sequential data file- Random access file-Binary files.

Text Book:

Byron S Goutfield: VB, Schamn's outlines, TMH edition-2002.

- Unit I** : Chapter 1 Sec 1.1-1.1.3, Chapter 2 Sec 2.1-2.5, 2.8 – 2.10
Unit II : Chapter 3 Sec 3.1, 3.3-3.9, Chapter 4 Sec 4.1-4.6
Unit III : Chapter 5 Sec 5.1 – 5.6, Chapter 6 Sec 6.1-6.7.
Unit IV : Chapter 7 Sec 7.1 – 7.6, Chapter 8 Sec 8.1, 8.2, 8.5, 8.7
Unit V : Chapter 9 Sec 9.1 – 9.6

Reference Book:

Mohammed Azam: Programming with VB 6.0, Vikas Publications- 2001.

SEMESTER V

CORE 17: VISUAL BASIC-PRACTICAL

Subject Code:16U5MCCP17

Total Hrs:45

No. of Credits: 2

VISUAL BASIC – PRACTICAL LIST

1. In VB, create a project that displays the current date and time. Use VB variable Now and the Format library function.
2. Write a program to enter and display text. Use text box and command button.
3. Write a program to convert temperature from Fahrenheit to centigrade or vice-versa.
4. Write a program to select any one from a list. Use combo box to display choices.
5. Write a program to calculate factorial of a given number.
6. Write a program to illustrate the usage of Timer control.
7. Write a program to illustrate the usage of scroll bars.
8. Write a program to illustrate the Drop down menus.
9. Write a program to illustrate the usage of menu enhancement.
10. Write a program to illustrate the usage of Pop-up menu.
11. Write a program to illustrate the usage of input boxes.
12. Write a program to find smallest of n numbers.
13. Write a program to find the sine of angle.
14. Write a program to sort list of numbers.
15. Write a program to determine deviations about an average.

SEMESTER V**ELECTIVE 1:OPTIMIZATION TECHNIQUES-I****Subject Code:16U5MCET1A****Total Hrs:75****No. of Credits: 3****Objectives:**

- To understand the fundamentals of Operations Research and Linear Programming.
- To solve Linear Programming Problem using Dual Simplex method.
- To get expose with transportation and assignment models.

UNIT I**(15HRS)**

Introduction to Operation Research- Modeling in Operation Research-Classification of Models-Advantages and Limitations of Models-Application of Operations Research-Linear Programming Problem-Simplex Method-Graphical Method.

UNIT II**(15HRS)**

Big M Method (Method of Penalties)-Algorithm- Problems – Solving Linear Programming Problem by using Two phase Method-Problems.

UNIT III**(15HRS)**

Duality in Linear Programming-Optimum Dual solution-Mathematical formulation-Solving Linear Programming Problem by Dual Simplex method.

UNIT IV**(15HRS)**

The Transportation Problems- Initial Basic Feasible Solution by North West Corner rule-Least Cost Method-Vogel's Approximation Method-MODI Algorithm for Optimum Solutions-Unbalanced Transportation Problems.

UNIT V**(15HRS)**

The Assignment Problems-Assignment Algorithm-Optimum Solution-Unbalanced Assignment problem-Travelling Salesman Problem.

Text Book:

Problems in Operation Research- P.K. Gupta and Man Mohan-11th Edition, Sultan Chand & Sons, New Delhi-2007.

Unit I : Chapter 0 , Chapter 1,2 and 4

Unit II : Chapter 5, 6

Unit III : Chapter 8, 9

Unit IV : Chapter 15

Unit V : Chapter 16

Reference Books:

1. *Kanti Swarup, P.K. Gupta and Man Mohan :Operation Research:Sultan Chand & sons, 13th Edition, New Delhi-2007.*
2. *Prof. V. Sundaresan, K.S. Ganapathy Subramanian, K. Ganesan :Resource Management Techniques, 6th Edition, A.R. Publications, Chennai-2012.*
3. *Prem Kumar Gupta D.S, Hira S :Operation Research, Chand & Company Ltd, Ram Nagar, New Delhi-2007.*

SEMESTER V**ELECTIVE 1: SOFTWARE ENGINEERING****Subject Code: 16U5MCET1B****Total Hrs: 75****No. of Credits: 3****Objectives:**

- To acquire Knowledge of Software Designing.
- To Know concept of Fundamental Designing Techniques
- To learn about the Guidelines of Software Designing.

UNIT I**(15HRS)**

Introduction to Software Designing- Definitions – Size Factors – Quality and Productivity Factors- Planning a Software Project- Planning the Development Process – Planning an Organizational Structure.

UNIT II**(15HRS)**

Software Cost Estimation- Software cost Factors – Software Cost Estimation Techniques – Staffing-Level Estimation – Estimating Software Estimation Costs.

UNIT III**(15HRS)**

Software Requirements Definition- The Software Requirements specification – Formal Specification Techniques. Software Design- Fundamental Design Concepts – Modules and Modularization Criteria.

UNIT IV**(15HRS)**

Implementation Issues- Structured Coding Techniques – Coding Style – Standards and Guidelines – Documentation Guidelines.

UNIT V**(15HRS)**

Verification and Validation Techniques- Quality Assurance – Walkthroughs and Inspections – Unit Testing and Debugging – System Testing.

Text Book:

Software Engineering Concepts – Richard Fairley - 1997, TMH.

Unit I	: Chapter 1 Sec 1.1-1.3,2.3-2.4
Unit II	: Chapter 3 Sec 3.1-3.4
Unit III	: Chapter 4 Sec 4.1-4.2,5.1-5.2
Unit IV	: Chapter 6 Sec 6.1-6.4
Unit V	: Chapter 8 Sec 8.1-8.2, 8.5-8.6

Reference Books:

- 1.Eve Anderson, Philip Greenspun, Andrew Grumet :Software Engineering for Internet Applications ,PHI- 2006.
- 2.Rajib Mall :Fundamentals of Software Engineering, 2nd edition, PHI.
- 3.Stephen Schach : Software Engineering, 7th edition, TMH.

SEMESTER V**ELECTIVE 1: LINEAR ALGEBRA****Subject Code: 16U5MCET1C****Total Hrs: 75****No. of Credits: 3****Objectives:**

- To gain knowledge about Linear spaces and its properties.
- To about Inner product spaces and Solving problems.
- To Know about Concept of Eigen Values.

UNIT I (15HRS)

Vector spaces, Definition and Examples – Subspaces – Linear transformation – Span of Set.

UNIT II (15HRS)

Linear Independence – Basis and dimensions – Rank and Nullity – Matrix of Linear transformation

UNIT III (15HRS)

Inner Product spaces – Definitions and Examples – Orthogonality - Orthogonal complement.

UNIT IV (15HRS)

Theory of Matrices – Inverse of Matrix – Elementary Transformations

UNIT V (15HRS)

Characteristic equations Cayley Hamilton theorem – Eigen Values and Eigen vectors – Properties of Eigen values

Text Book:*S.Arumugam, A.T. Issac: Modern Algebra ,Scitech Publications – 2005.***Unit I** : Chapter 5 : Sec 5.0 – 5.4**Unit II** : Chapter 5 : Sec 5.5 – 5.8**Unit III** : Chapter 6 : Sec 6.0 – 6.3**Unit IV** : Chapter 7 : Sec 7.0 – 7.4**Unit V** : Chapter 7 : Sec 7.7-7.8**Reference Books:**

1. Vijay K Khanna , SK Bhambri: *A Course in abstract algebra*, Vikas Publishing House, 4th Edition – 2013.
2. Kenneth Hoffman, Ray Kunze, *Linear Algebra* Phi learning Private limited 2nd Edition - 2011.
3. Joseph A.Gallian: *Contemporary Abstract Algebra*, Narosa Publishing House, 4th Edition, Reprint – 1999.

SEMESTER V**ELECTIVE 2: NUMERICAL METHODS****Subject Code:16U5MCET2A****Total Hrs:75****No. of Credits:3****Objectives:**

1. To Know about Algebraic and Transcendental Equations
2. To Know about the Forward and Backward Differences
3. To Know the concepts Interpolation and Numerical Differentiation.

UNIT I**(15HRS)**

The Solution of Numerical Algebraic and Transcendental Equations - Bisection Method-Regula Falsi Method-Geometrical Interpolation-Newton Raphson Method-Geometrical meaning of Newton's method-Convergence in Newton Raphson Method-Order of convergence of Newton's method- The Solution of Simultaneous Linear Algebraic Equation- Gauss Elimination Method-Gauss Jordan Method-Gauss Jacobi Method-Gauss Seidal Method

UNIT II**(15HRS)**

Finite Difference- Differences-Operators-Forward and Backward Difference Tables-Differences of a Polynomial-Factorial Polynomial-Error Propagation in Difference Table.

UNIT III**(15HRS)**

Interpolation(for equal intervals)-Introduction-Linear interpolation-Error in polynomial interpolation-Newton's forward and Backward formulae-Error in Newton's forward and backward interpolation-Equidistant terms with one or more missing values

UNIT IV**(15HRS)**

Numerical Differentiation-Introduction-Newton's forward and backward formula-Stirling's formula-to find maxima and minima of the function given the tabular values.

Numerical Integration-Introduction-Newton-Cot's formula- Trapezoidal Rule Geometrical interpretation-Truncation error in trapezoidal rule -Simpson's $1/3^{\text{rd}}$ and $3/8^{\text{th}}$ rules-Truncation error in Simpson rule.

UNIT V**(15HRS)**

Numerical solution of first order-Taylor's series method-Taylor's series for simultaenous first ODE & second ODE -Euler's method-improved Euler method-modified Euler method - Runge kutta method(fourth order only) – Milne's predictor corrector formula-Adam Bashforth predictor corrector formula.

Text Book:

Kandasamy.P , Thilagavathi.K and Gunavathi.K: NUMERICAL METHODS, S.Chand and Company Ltd, New Delhi-3rd revised edition-2013.

Unit I : Chapter 3- Sections- 3.1, 3.1.1, 3.3, 3.3.1, 3.4, 3.4.1, 3.4.2, 3.4.3
Chapter 4- Sections- 4.1, 4.2, 4.2.1, 4.8, 4.9

Unit II : Chapter 5- Sections- 5.1-5.5

Unit III : Chapter 6- Sections- 6.1-6.7

Unit IV : Chapter 9- Sections- 9.1-9.6, 9.7-9.11, 9.13, 9.14, 9.16

Unit V : Chapter 11- Sections- 11.5-11.7, 11.9-11.11, 11.12,11.13,11.16,11.17

Reference Books:

1. *Dr. S. Arumugam, A. Thangapandi Isaac, Dr. A. Somasundaram :Numerical Methods, 2nd Edition, Scitech Publications Private Limited Chennai-2009.*

2. *S. S. Sastry :Introductory Methods of Numerical Analysis- Second Edition Prentice Hall of India Private Limited, New Delhi-2010.*

3.*Sandip Banerjee :Topics in Mathematics- Books and Allied Private Limited Kolkata 3rd Edition-2005.*

SEMESTER V

ELECTIVE 2: NUMBER THEORY

Subject Code: 16U5MCET2B

Total Hrs: 75

No. of Credits: 3

Objectives:

- To know the Basic concepts of Number theory and prime & Composite Numbers
- To learn concepts of Congruences and application of Fermat and Wilson theorems.
- To understand the concept of primitive roots and problem solving.

UNIT I**(15HRS)**

Divisibility: Divisibility of integer- Division Algorithm-Common Divisor-Greatest Common Divisor- The Euclidean Algorithm-To find the HCF of more than two integers-Least Common Multiple-Worked Examples.

UNIT II**(15HRS)**

Primes and Composite Numbers: Definition of Prime, Composite, Two prime-Euclid's Theorem- unique factorization Theorem-To find GCD and LCM of two integers-Positional representation of integers-Worked examples.

UNIT III**(15HRS)**

Congruences: Definition- Theorems and worked Examples. Linear congruences: Definition- Theorems and worked examples.

UNIT IV**(15HRS)**

Theorem of Fermat and Wilson: Introduction-Fermat Theorem-Another Form of Fermat's Theorem-Euler's Extension of Fermat's Theorem -Worked Examples-Wilson's Theorem-Second proof of Wilson's theorem-Third proof of Wilson's Theorem-Converse of Wilson's Theorem

UNIT V**(15HRS)**

Primitive Roots: Order of $a \pmod{m}$ -Theorems-worked Examples-Primitive roots-Theorems-Legendre's Theorem-Worked Examples

Text Book:

Kumaravelu and Suseela Kumaravelu :Elements of Number Theory, Raja Sankar offset

Printers - 2002

- Unit I** : Chapter 3 Page No 45-57
Unit II : Chapter 4 Page No 60-75
Unit III : Chapter 6 Page No 163-174, 189-197
Unit IV : Chapter 7 Page No 208-221, 228-231
Unit V : Chapter 9 Page No 274-281, 283-303

Reference Books:

1. Ivan Niven and Herbert S. Zuckerman :An Introduction to the Theory of Numbers, 3rd edition Wiley Eastern Ltd -1972.
2. David M, Burton :Elementary Number Theory, Second edition, Universal Book stall, New Delhi, -1991
3. T. M. Apostol :Introduction to Analytical Number Theory, Springer Verlag, 8th reprint – 1998.

SEMESTER V
ELECTIVE 2: DIGITAL ELECTRONICS AND COMPUTER
FUNDAMENTALS

Subject Code: 16U5MCET2C**Total Hrs:75****No. of Credits:3****Objectives:**

- To Know about Number system and codes.
- To acquire Knowledge about Various Logic Gates.
- To Know about Input and Output devices.

UNIT I**(15HRS)**

Representation of information Number System and Codes – Binary to Decimal Conversion - Decimal to Binary Conversion – Octal Numbers – Hexadecimal Numbers – ASCII Code – Excess-3 Code – Gray Code

UNIT II**(15HRS)**

Logic circuits: Gates – AND, OR, NOT, NAND and NOR gates – Truth tables – Boolean Algebra – Karnaugh Maps – Product of sum and Sum of product methods – Don't care conditions – Multiplexers and Demultiplexers – Flip flops – RS, JK, D, T flip flops – Decoders.

UNIT III**(15HRS)**

Shift Registers – Counters – Arithmetic circuits – Half adder – Full Adder – Half & full Subtractor – Binary adder & Subtractor – Serial & Parallel Binary Adders – BCD Adder.

UNIT IV**(15HRS)**

I/O devices: Punched tape – Tape readers – Alphanumeric codes – Character recognition – CRT – Output Device : Magnetic tape Output offline Operation – Error detecting and correcting codes – Printers: Dot Matrix, Laser, CRT, Keyboards – Terminals.

UNIT V**(15HRS)**

Semiconductor Memories: ROM – RAM – Static RAM, Dynamic RAM – Magnetic disc memories – Magnetic tape – Digital recording techniques

Text Books:

1. *Albert Malvino and Donald P Leach: Digital Principles and Applications, Tata Mc Graw Hill Company limited, New Delhi- 3rd reprint -2007.* **(UNIT I, II & III)**

2. *T.C.Bartee : Digital Computer fundamentals, Tata Mc Graw Hill Company limited, New Delhi- 8th reprint -1998.* **(UNIT IV & V)**

Unit I : Chapter 5- Sections- 5.1-5.8

Unit II : Chapter 3- Sections- 3.1-3.3, 3.6 – 3.8, Chapter 4- Sections- 4.1-4.3, Chapter 8-Sections- 8.1, 8.3-8.5

Unit III : Chapter 6- Sections- 6.1, 6.2, 6.8, 6.9, 6.12

Unit IV : Chapter 7- Sections- 7.1, 7.2, 7.5 -7.11

Unit V : Chapter 6- Sections- 6.1, 6.6-6.10, 6.12, 6.15

Reference Book:

S. Salivaganan and S. Arivalagan: *Digital Circuits and Design*, Vikas Publishing Pvt Ltd 2nd reprint -2002.

SEMESTER-V

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

Numerical Reasoning
Mental Ability
Logical Reasoning

Text Books:

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

SEMESTER VI

CORE 18: COMPLEX ANALYSIS

Subject Code:16U6MCCT18**Total Hrs: 75****No. of Credits: 5****Objectives:**

- To Know the fundamentals in Analytical, Harmonic functions and Bilinear transforms.
- To Evaluate Complex Integrals using Cauchy's Integral formula.
- To Understand concepts of Singularities, Residues and Problem solving.

UNIT I**(15 HRS)**

Analytic functions- C-R equation – sufficient condition – Harmonic functions.

UNIT II**(15 HRS)**

Bilinear transformations – Cross ratio – Fixed points – Transformations which map real axis to real axis - unit circle to unit circle – real axis to unit circle.

UNIT III**(17HRS)**

Complex Integration – Cauchy's Integral theorem – Cauchy's Integral formula – Derivatives of analytic function – Morera's theorem – Cauchy's inequality – Liouville's theorem – Fundamental theorem of Algebra

UNIT IV**(15 HRS)**

Taylor's theorem – Taylor's series – Laurent's series – Singular points – Types of singularities - Properties of singular – Properties of Singularities – Identification of singularities.

UNIT V**(13 HRS)**

Argument principle – Rouché's theorem – Calculus of residues – Evaluation of definite Integrals.

Text Book:

Duraipandian and Laxmi Duraipandian:Complex analysis, Emerald Publications- 2005.

Unit I : Chapter 4: Sec 4.5 – 4.9, Chapter 6 Sec 6.12**Unit II** : Chapter 7: Sec 7.1 – 7.9**Unit III** : Chapter 8: Sec 8.1 – 8.13**Unit IV** : Chapter 9: Sec 9.1 – 9.13**Unit V** : Chapter 10: Sec 10.1 – 10.4**Reference Books:**

1. Shanti Narayanan, Dr.P.K.Mittal :Theory of Functions of a Complex Analysis, S.Chand and company, Reprint – 2012.

2. S.ponnusamy :foundations of complex analysis, narosa publishing house, 9th reprint – 2013.

3. S.Arumugam, A.Thangapandi Issac, A.Somasundram:ComplexAnalysis, Scitech Publications-2004.

SEMESTER VI**CORE 19: DISCRETE MATHEMATICS****Subject Code:16U6MCCT19****Total Hrs: 75****No. of Credits: 5****Objectives:**

- To understand the concepts of Set theory and Logic.
- To learn the concept of Lattices and Boolean Algebra
- To get expose with Formal Languages and Graph theory

UNIT I**(15 HRS)**

Mathematical Logic- Statements and Notations - Connectives – Negation - Conjunction - Disjunction - Conditional and bi-Conditional- Well Formed Formulas -Tautology - Equivalence of Formulas - Algebra and Duality.

UNIT II**(15 HRS)**

Set Theory- Basic concept of Set Theory- Some Operations on Sets -Venn Diagram. Relation and Functions - Composition of Relations-Poset-Partial Ordering-Composition of Functions-Inverse Function-One to One Function.

UNIT III**(13 HRS)**

Lattices and Algebra Structure - Lattices- Uper bound Lower bound-Types of Lattice(Basic Definition with Examples)-Groups- Permutation Groups, Semi Groups-Coset-Monoids

UNIT IV**(17 HRS)**

Boolean Algebra and Formal Languages - Boolean Algebra-Theorems -Boolean Functions- Boolean Expression-Minterm and Maxterm -Languages-Operations on Languages- Regular Expression-Discussion of Grammars-Types of Grammar - PSL, CSL, CFL,RL-Problems.

UNIT V**(15 HRS)**

Graph Theory-Basic Definition-Subgraphs-Types of Graphs-Path, Connectedness-wlak and Trail-Matrix Representation-Digraph and Undirected Graph-Trees: Basic Definitions and Examples- Binary trees -Simple Theorems, Problems.

Text Book:

J.K. Sharma: Discrete Mathematics, 2nd Edition, Macmillan India Ltd-2005.

Unit I : Chapter 12 Sections 12.1, 12.3, 12.5, 12.6, 12.7, 12.8, 12.13

Unit II : Chapter 1 Sections 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, Chapter 3 Sections 3.3, 3.5, 3.6, 3.11, Chapter 4 Sections 4.1, 4.2, 4.5

Unit III : Chapter 14 Sections 14.1, 14.2, 14.4 , Chapter 11 Sections 11.4, 11.8, 11.9,

Unit IV : Chapter 13 Sections 13.2, 13.3, 13.5, 13.9, 13.10, Chapter 15 Sections 15.1, 15.2, 15.3, 15.4, 15.5,15.5.1, 15.5.2.

Unit V : Chapter 9 Sections 9.1, 9.2, 9.3, 9.4, 9.5, 9.8, Chapter 10 Sections 10.2, 10.3, 10.6, 10.6.1, 10.6.2, 10.6.3

Reference Books:

1.J.P.Trembly R Manohar,Discrete Mathematical structure with ap[plications to computer science,Mc Graw Hill International Edition, 2007

2. *Discrete Mathematics* by N. Chandrasekar, M. Umaparvathi

3. *Graph Theory* by Narsingh Deo (Unit V)

SEMESTER VI

CORE 20: MATLAB

Subject Code:16U6MCCT20

Total Hrs: 75

No. of Credits: 5

Objectives:

- To understand the basics of MATLAB, Commands in MATLAB and Array operations.
- To solve equations, problems in interpolation and Statistics using MATLAB.
- To evaluate Numerical Integration and Ordinary Differential Equations.

UNIT I

(15 HRS)

Introduction – Basics of MATLAB-MATLAB Windows-Online help-Input-Output, File types-General Commands

UNIT II

(15 HRS)

Interactive Computation - Matrices and Vectors- Matrix and Array Operations-Command line Functions-Using Built in Functions and ON-line Help

UNIT III

(15 HRS)

Applications- Linear Algebra-Curve fitting and Interpolation-Data analysis and Statistics

UNIT IV

(15 HRS)

Numerical Integration-Ordinary Differential Equations-Nonlinear Algebraic Equations.

UNIT V

(15 HRS)

Programming in MATLAB-Scripts and Function-Script Files-Function files-Plotting Simple graphs- Graphics- Basic 2D plots-3D plots.

Text Book:

Rudra Pratap: *MATLAB- A Quick introduction for Scientists and Engineers*, Oxford University Press - 2003.

Unit I : Chapter 1, Section 1.1, 1.6 (Expect 1.6.5) [page No: 3, 7-11, 14]

Unit II : Chapter 3 Section 3.1,3.2 [Page No: 51-64, 70-74]

Unit III : Chapter 5 Section 5.1, 5.2, 5.3 (Expect 2.1.2, 5.2.4)
[Page No. 120-124, 125-130, 133-134, 136-139, 142-150, 154-15]

Unit IV : Chapter 5 section 5.4, 5.5, 5.6

Unit V : Chapter 3,4 &6 Section 3.7, 4.1, 4.2, 6.1, 6.3

Reference Books:

1. *Rudra Pratap: Matlab-7, Oxford University Press, New Delhi- 2006*

2. *V.Kirani Singh, B.B. Chandhuri: MATLAB Programming, Printice Hall of India Private Limited, New Delhi- 2007.*

SEMESTER VI
CORE 21 : MAT LAB - PRACTICAL

Subject Code: 16U6MCCP21

Total Hrs:75

No. of Credits:2

MAT LAB PRACTICAL LIST

1. Write a program to get a solution for simultaneous equations
2. Write a program to find eigen values and eigen vectors for the given matrix.
3. Write a program to draw graphs using plot and ez plot
4. Write a program to differentiate and integrate the given function.
5. Write a program to find mean, median, mode and standard deviation for the given data.

SEMESTER VI

ELECTIVE 3: OPTIMIZATION TECHNIQUE-II

Subject Code:16U6MCET3A**Total Hrs:75****No. of Credits:3****Objectives:**

- To know about Game Theory and Queueing System.
- To know about Inventory Control and applications.
- To know about Network and sequencing problems.

UNIT I**(15HRS)**

Game Theory: Two person zero sum game- The Maxmini- Minimax Principle-Problems- Solution of 2x2 rectangular Games-Domination Property-(2xn) and (mx2) graphical method-Problems.

Queueing Theory- Introduction-Queueing system-Characteristics of Queueing system-Symbols and notations-Classifications of queues-Problems in (M/M/1):(∞/FIFO); (M/M/1):(N/FIFO); (M/M/C): (N/FIFO)- (M/M/C):(∞ :FIFO)

UNIT II**(15HRS)**

Inventory Control-Types of inventories-Inventory costs-EOQ problem with no shortages-Production problems with no shortages-EOQ with shortages-Production problem with shortages-EOQ with price breaks.

UNIT III**(15HRS)**

Network scheduling by PERT/CPM-Introduction-Network and basic components-Rules of Network construction- Time calculation in Networks -CPM. PERT-PERT calculation – Floats – Independent free float – Total float.

UNIT IV**(15HRS)**

Replacement Problem: Introduction- Replacement of Equipment/asset that deteriorates gradually-Replacement of equipment that fails suddenly and problems.

UNIT V**(15HRS)**

Sequencing Problems: Introduction – Problems of sequencing-Basic terms used in sequencing-Processing n-jobs through 2 machines-processing n-jobs through k machines-processing 2 jobs through k machines.

Text Book:

P.K. Gupta and Man Mohan: Problems in Operation Research-11th Edition, Sultan Chand & Sons - 2007

Unit I : Chapter 20 and Chapter 22

Unit II : Chapter 23

Unit III : Chapter 27

Unit IV : Chapter 24

Unit V : Chapter 17

Reference Books:

1. Kanti Swarup, P.K. Gupta and Man Mohan :Operation Research:Sultan Chand & sons, 13th Edition, New Delhi-2007.
2. Prof. V. Sundaresan, K.S. Ganapathy Subramanian, K. Ganesan :Resource Management

Techniques, 6th Edition, A.R. Publications, Chennai-2012.

3. *Prem Kumar Gupta D.S, Hira S : Operation Research, Chand & Company Ltd, Ram Nagar, New Delhi-2007.*

SEMESTER VI

ELECTIVE 3: ACTUARIAL MATHEMATICS

Subject Code: 16U6MCET3B

Total Hrs:75

No. of Credits:3

Objectives:

- To know about Probability and Life Tables, Actuarial Notation
- To know about types of Insurance.
- To acquire knowledge about premiums and its benefits.

UNIT I

(15HRS)

Basics of Probability and Interest- Probability – Theory of Interest: Variable Interest Rates – Continuous – time payment Streams – Problems.

Interest & Force of Mortality- More on Theory of Interest – Annuities & Actuarial Notation – Loan Amortization & Mortgage Refinancing – Illustration on Mortgage of Refinancing – Computational illustration in Splus – Coupon & Zero – Coupon Bonds Force of Mortality & Analytical Models: Comparison of Forces of Mortality – Problems

UNIT II

(15HRS)

Probability & Life Tables- Interpreting Force of Mortality – Interpolation Between Integer Ages – Binomial Variables & Law of Large Numbers: Exact Probabilities, Bounds & Approximations – Simulation of Life Table Data: Expectation for Discrete Random Variables – Rules for Manipulating Expectations – Some Special Integrals – Problems
Expected Present Values of Payments-Expected Payment Values : Types of Insurance & Life Annuity Contracts - Formal Relations among Net single Premiums – Formulas for Net Single Premiums – Expected Present values for $m=1$ -Continuous Contracts & Residual Life: Numerical calculations of Life Expectancies – Problems.

UNIT III

(15HRS)

Premium Calculation- m -Payment Net Single Premiums- Dependence Between Integer & Fractional Ages at Death – Net Single Premium Formulas – two cases
Approximate Formulas via first case – Net Level Premiums – Benefits Involving Fractional Premiums – Problems-Commutation & Reserves: Idea of Commutation Functions: Variable – benefit Commutation Formulas – Secular Trends in Mortality – Reserve & Cash Value of a single Policy: Retrospective Formulas & Identities – Relating Insurance & Endowment Reserves – Reserves under Constant Force of Mortality- Reserves under Increasing Force of Mortality – Recursive Calculation of Reserves – Paid – Up Insurance – Select Mortality Tables & Insurance – Illustration of Communication Columns – Examples on paid – Up Insurance – Problems.

UNIT IV

(15HRS)

Population Theory- Population Functions & Indicator Notation: Expectation & Variance of Residual life – Stationary – Population Concepts – Estimation Using Life – Table Data – Non stationary Population Dynamics:- Appendix: Large – time Limit of $(t;x)$ – Population Word Problems.

Estimation from Life- Table Data- General Life – Table Data - ML Estimation for Exponential Data – MLE for Age Specific Force of Mortality: Extension to Random Entry & Censoring Times – Kaplan – Meier Survival Function Estimator – Problems.

UNIT V

(15HRS)

Risk Models & Select Mortality-Proportional Hazard Models – Excess Risk Models – Select Life Tables – Problems-Multiple Decrement Models- Multiple Decrement Tables – Death – Rate Estimators- Deaths Uniform within Year of Age – Force of Mortality Constant within Year of Age – Cause – Specific Death Rate Estimators – Single – Decrement Tables and Net Hazards of Mortality – Cause – Specific Life Insurance Premiums - Problems Central Limit Theorem & Portfolio Risks – Problems.

Text Book:

Eric V.Slud: Actuarial Mathematics and Life – Table Statistics, Mathematics Department, University of Maryland, College Park, Edition- 2001

Reference Books:

1. *Jerry Alan veeh: Lecture Notes on Actuarial Mathematics (E-Notes), -2006.*
2. *Bowers, N.Gerber, H.Hickman, J.Jones, and Nesbitt: C. Actuarial Mathematics, Society of Actuaries, Itasca, III - 1986.*
3. *Feller: W. An Introduction to Probability Theory and its Applications, Vol.I, 2nd ed. Wiley, New York - 1957.*
4. *Gerber.H.Life : Insurance Mathematics, Third ed. Springer – Verlag, Newyork - 1997.*

SEMESTER VI

ELECTIVE 3: INFORMATION SECURITY

Subject Code: 16U6MCET3C**Total Hrs:75****No. of Credits:3****Objectives:**

- To learn about the basic of Information Security.
- To Acquire knowledge in Risk Management and Planning.
- To understand the concepts of Logical and Physical Design.
- To enhance the key concepts of Security Technology.

UNIT I**(15HRS)**

Introduction to Information Security- History -What is Security- Critical Characteristics of Information: Availability-Accuracy-Authenticity-Confidentiality-Integrity-Utility-Possession: NSTISSC Security Model- Components of an Information system: Software-Hardware-Data-People-Procedures-Networks.

UNIT II**(15HRS)**

The Need For Security: Introduction-Business Needs:Protecting the functionality of Organization-Enabling the Safe Operation of Applications; Threats: Acts of Human Error or Failure-Compromises to Intellectual Property-Deliberate Acts of Espionage or Trespass; Attacks: Malicious Code-Hoaxes-Back Doors-Password Crack-Spam-Mail Bombing-Sniffers-Social Engineering.

UNIT III**(15HRS)**

Legal, Ethical, and Professional Issues in Information Security: Introduction-Laws and Ethics in Information Security-Types of Law-International Laws and Legal Bodies: European Council Cyber-Crime Convention-Digital Millennium Copyright Act- United Nation Character; Ethics and Information Security: Ethical Difference Across Cultures-Software licence Infringement-Illicit Use-Misuse of Corporate Resources-Ethics and Education; Codes of Ethics and Professional Organizations: Major Professional Organizations for IT-Other Security Organization.

UNIT IV**(15HRS)**

Risk Management: Introduction-An overview of Risk Management; Risk Identification: Asset Identification and valuation-Automated Risk Management Rules-Information Asset Classification-Information Asset Valuation-Listing Assets in Order of Importance-Data Classification and Management; Risk Assessment: Introduction to Risk Assessment-Likelihood Valuation of Information Asset-Risk Determination; Risk Control Strategies: Avoidance-Implementing Avoidance-Transference-Mitigation; Risk Management Discussion Points: Risk Appetite-Residual Risk.

UNIT V**(15HRS)**

Planning for Security: Introduction-Information Security policy, Standard, and Practice: Definition-Enterprise Information Security Policy-Issue Specific Security Policy-System Specific Policy-Policy Management; The Information Security Blueprints: ISO 17799/BS7799-NIST Security Models-IETF Security Architecture-VISA International Security Model; Security Education, Training and Awareness Program; Continuity Strategies: Business Impact Analysis-Incident Response Planning-Disaster Recovery Planning-Business Continuity Planning

Text Book:

E.Michel Whitman, CISSP and Herbert, J. Mattord, CISSP:Principles of Information Security,Thomson Course Technology, Second Indian Reprint – 2007.

Unit I : Chapter 1: page No:1-16

- Unit II** : Chapter 2: Page No:35-37, 38-43, 60-62, 65-66
Unit III : Chapter 3: Page No: 75-77, 85-88, 89-94, 96-99
Unit IV : Chapter 4: Page NO: 109-112, 114-121, 132-134, 138-142, 161-162
Unit V : Chapter 5: Page No: 171-183, 186-195, 203-205, 206-228

Reference Books:

1. *Mark Rhodes-Ousley: The Complete Reference, Information Security, McGraw Hill Education Private Limited, Indian Edition – 2013.*
2. *Thomas R. Pelties: Information Security Fundamentals, BN5.*

SEMESTER VI

ELECTIVE 4: FUZZY MATHEMATICS

Subject Code: 16U6MCET4A

Total Hrs:75

No. of Credits:3

Objectives:

- To know the basic concepts of fuzzy sets and its characteristics.
- To understand the concept of various operations on fuzzy sets.
- To learn the concept of fuzzy relations and its applications.

UNIT I

(15HRS)

From classical sets to Fuzzy sets: Introduction-Crisp Sets: An overview-Fuzzy set: Basic types-Fuzzy sets: Basic Concepts-Characteristics and significance of the paradigm Shift

UNIT II

(15HRS)

Fuzzy sets versus crisp sets: Additional properties of α -Cuts- Representations of fuzzy sets-Extension Principle of Fuzzy sets.

UNIT III

(15HRS)

Operations on fuzzy sets: Types of Operations-Fuzzy complements-Fuzzy Intersections: t-Norms-Fuzzy unions: t-conorms

UNIT IV

(15HRS)

Fuzzy Arithmetic: Fuzzy Numbers-Linguistic Variables-Arithmetic Operations on intervals

UNIT V

(15HRS)

Fuzzy Relations: Crisp versus Fuzzy Relations-Projections and Cylindric Extensions-Binary Fuzzy Relations-Binary relations on a single set-Fuzzy Equivalence Relations-Fuzzy Compatibility Relations.

Text Book:

George, J.Klir and Tina A, Folger:Fuzzy Sets Uncertainty and Information,Printice Hall of India Pvt Ltd, New Delhi – 2006.

Unit I : Page no: 1-30

Unit II : Page no: 35-48

Unit III : Page no: 50-96

Unit IV : Page no: 97-102

Unit V : Page no: 119-135

Reference Books:

1. John Yuan, Reza Langari: *Fuzzy Logic Intelligence, Control and information*, Pearson

Education, New Delh - 1999

2. M.Amirthavalli: *Fuzzy logc and Neural Networks*, Scitech Publications Pvt Ltd, Chennai and Hydrabad - 2007

3. Timothy , Jo Ross: *Fuzzy Lgic with Engineering Applications*, McGraw-Hill INC, New York - 1996.

SEMESTER VI

ELECTIVE 4: APPLIED MATHEMATICS

Subject Code: 16U6MCET4B

Total Hrs:75

No. of Credits:3

Objectives:

- To acquire knowledge about fundamentals of graphs theory and its applications.
- To understand the concept of Automata and its applications.
- To make the students to know about the fundamentals in coding theory.

UNIT I

(15Hrs)

Connected graphs, Disconnected graphs and Components-Euler Graphs-Operation on graphs-More on Euler Graphs

UNIT II

(15Hrs)

Trees: Properties of Trees-Rooted trees-Binary trees- Binary Search Trees- Decision Trees.

UNIT III

(15Hrs)

Spanning Trees: Definition and Properties of Spanning Trees-Algorithm on Spanning Trees-Minimal Spanning Trees-Travelling Salesman Problem-Huffman code.

UNIT IV

(15Hrs)

Basic Notation and Definition-Finite Automata-Deterministic Finite Automata-Simple Notation for Deterministic Finite state Automata (DFA)-Transition table-Language Accepted by DFA-DFA Design Techniques: Pattern Recognition Problems. Non Deterministic Finite state Automata-Moves made by NFA-Transition Function of NFA to string-Language Accepted by NFA-Conversion of NFA to DFA

UNIT V

(15Hrs)

Derivations- Sentences-Languages-Left most derivation-Right most Derivation-Ambiguous Grammar

Text Book

1. N. Chandrasekar, M. Umavparvathi: *Discrete Mathematics*, PHI Learning Private Limited, New Delhi-2010. **(Unit I)**

2.Narsingh Deo: *Graph Theory with applications to engineering and computer science*, Prentice Hall of India, New Delhi – 2005 **(Unit II, III)**

3.A.M.Padma reddy: *Finite Automata and Formal language-A simple Approach*, Sanguine Technical Publishers Bangalore - 2012 **(Unit IV,V)**

Unit I : Chapter 2: 2.5, 2.6, 2.7, 2.8

Unit II : Chapter 11: 11.1, 11.2, 11.2.1, 11.2.2, 11.2.3, 11.2.4

Unit III : Chapter 11: 11.3, 11.3.2, 11.4, 11.5, 11.6

Unit IV : Chapter 1: 1.2, 1.2.1, 1.2.2, 1.2.3, 1.3, 1.4, 1.5, 1.5.1 to 1.5.5, 1.6, 1.6.1, 1.7, 1.10, 1.10.1, 1.10.2, 1.10.3, 1.11

Unit V : Chapter 4: 4.5, 4.5.1, 4.5.2, 4.7, 4.8, 4.9, 4.10

Reference Books:

1. Rani Sironmoney: *Formal language and automata*, Christian Literary Society, Madras - 2000.
2. Dr. N. Murugesan: *Principles of Automata Theory and Computation*, Sahithi Publication - 2004.
3. Hopcroft and Ullman: *Formal Language and their relation Automata*, Addison Wesley - 2006.
4. S. Kumaravelu & Susheela Kumaravelu: *Graph Theory*, Janki Calender Corporation, Sivakasi - 1999.

SEMESTER VI

ELECTIVE 4: COMPUTER NETWORKS

Subject Code: 16U6MCET4C

Total Hrs:75

No. of Credits:3

Objectives:

- To gain knowledge about computer networks.
- To know about the various protocols used in computer networks.
- To know the basic concepts of Cryptography and its applications.

UNIT I

(15Hrs)

Network Hardware- LAN – WAN – MAN – Wireless – Home Networks. Network Software: Protocol Hierarchies – Design Issues for the Layers – Connection-oriented and connectionless services – Service Primitives – The Relationship of services to Protocols. Reference Models: OSI Reference Model – TCP/IP reference Model – Comparison of OSI and TCP/IP -Critique of OSI and protocols – Critique of the TCP/IP Reference model.

UNIT II

(15Hrs)

Physical Layer - Guided Transmission Media: Magnetic Media – Twisted Pair – Coaxial Cable – Fiber Optics. Wireless Transmission: Electromagnetic Spectrum – Radio Transmission – Microwave Transmission – Infrared and Millimeter Waves – Light Waves.

UNIT III

(15Hrs)

Data-Link Layer- Error Detection and correction – Elementary Data-link Protocols – Sliding Window Protocols. Medium-Access Control Sub Layer- Multiple Access Protocols – Ethernet – Wireless LANs - Broadband Wireless – Bluetooth.

UNIT IV

(15Hrs)

Network Layer- Routing algorithms – Congestion Control Algorithms. Transport Layer- Elements of Transport Protocols – Internet Transport Protocols- TCP.

UNIT V

(15Hrs)

Application Layer- DNS – E-mail- Network Security- Cryptography – Symmetric Key Algorithms – Public Key Algorithms – Digital Signatures.

Text Book:

Andrew S. Tanenbaum :Computer Networks, 4th edition, PHI, Pearson's Prentice Hall-2005.

Unit I : Chapter 1 Sec 1.2:1.4

Unit II : Chapter 2 Sec 2.2,2.3

Unit III : Chapter 3 Sec 3.2, 3.3 , Chapter 4 Sec 4.2- 4.6

Unit IV : Chapter 5 Sec 5.2, 5.3, Chapter 6 Sec 6.2, 6.4, 6.5

Unit V : Chapter 7 Sec 7.1,7.2, Chapter 8 Sec 8.1-8.4

Reference Books:

1. Achyut Godbole :*Data Communication And Networks*, TMH – 2007.

2. *Computer Networks Protocols, Standards, and Interfaces* – Uyles Black, 2nd ed, PHI.

SEMESTER-VI
Aptitude & Soft Skills - II

Subject Code: 16U5NCCT02

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

EXTRA CREDIT COURSE : HUMAN RESOURCE MANAGEMENT

Subject Code : 16UMCECC01

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: 16UMCECC02

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, 6th Edition - 2003.*
2. Christopher love lock: *Services Marketing, Person Education Chennai, 6th Edition - 2010.*
3. Philip Kotler: *Marketing Management, Person Education Chennai, 6th Editio - 2013*
4. S.Sherlekar: *Marketing Management, Himalaya Publication House, Mumbai, 6th Edition - 1997.*

EXTRA CREDIT COURSE : INVESTMENT MANAGEMENT

Subject Code: 16UMCECC03

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, 1st Edition - 2005.
2. Bhalla and Tuteja: *Investment Management*, S.Chand & Sons Publisher, New Delhi, 1st Edition - 1997.
3. V.A.Avadhani: *Investment Management*, Himalaya Publishing House, Mumbai, 1st Edition - 1997.
4. Punithavathy Pandian: *Security Analysis and Portfolio Management*, Vikas Publishing House Pvt Ltd, New Delhi, 1st Edition - 1997.

EXTRA CREDIT COURSE : CONSUMER MARKETING

Subject code: 16UMCECC04

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 Loyalty- Brand Extension- Conditioning Theories- Cognitive Learning Theory- Attitude and Attribute theory- Cognitive Dissonance- Self Concept- Development of Self- Fashion – Cosmetics- and Conspicuous Consumption

UNIT IV

Perception- Threshold of perception- Subliminal 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 Building- Ethics in Advertisement

Text Books:

1. Schiffman L.G and Kanuk L: *Relationship Marketing*, Tata MC Graw Hill, 12th Edition - 2009.
2. R.S.N Pillai and Bhavathi : *Modern Marketing Principles and Practices*, S.Chand & Co., Ltd., New Delhi, 7th Edition- 2011.
3. Paul green Berg: *Customer Relationship Management*, Tata MC Graw Hill, 7th Edition -2009.

Reference books:

1. Philip Kotler and Gray Armstrong: *Principles of Marketing*, Pearson Education Pvt Ltd., 7th Edition, Reprinted - 2011.
2. Dr.Rajan Nair: *Marketing Management*, Sulthan Chand & Sons, 7th Edition, NewDelhi

EXTRA CREDIT COURSE:INTERNATIONAL MARKETING

Subject Code: 16UMCECC05

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, 2nd Edition - 2010.*
2. *Saxena: Marketing Management, Himalaya Publication, 13th Edition - 2010.*

Reference Books

1. *Warren J Keegan: Global Marketing, Pearson Education, 7th Edition - 2002.*
2. *Franis Cherunilan: International trade and Export Management, Himalaya Publication House,1st Edition - 2012.*
3. *Paras Ram: International Business, Anupam publication, 21st Edition - 2012.*

EXTRA CREDIT COURSE : PRODUCTION AND OPERATIONS MANAGEMENT

Subject Code: 16UMCECC06

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:

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, 1st Edition - 2012.*
- 4.Neeti Gupta & Anuj Gupta: *Production and Materials Management, Kalyani Publishers - Edition 2015*

EXTRA CREDIT COURSE: ENTREPRENEURIAL DEVELOPMENT

Subject code: 16UMCECC07

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,ent of women council scheme

UNIT II

The start up process, project identification – selection of the product – project formulation-evaluation – 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 – subsidized 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, 5th Edition - 2008.*
2. *Renu Arora & S.KI.Sood: Fundamentals of Entrepreneurship and Small Business, Kalyani Publishers, 1st Revised, - Reprint 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

Subject Code: 16UMCECC08

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, 1st Edition - 2004.*

Reference Books:

1. *Kenneth C. Laudon: Management Information System, Pearson Education, New Delhi, 1st Edition - 2004.*
2. *Stephen Haag: Management Information System, Tata McGraw Hill Publication, New Delhi, 1st Edition - 2008.*

EXTRA CREDIT COURSE : EXECUTIVE BUSINESS COMMUNICATION

Subject Code: 16UMCECC09

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 : BASIC BUSINESS LAW

Subject code : 16UMCECC10

No. of credits: 2

Objective:

- To enable the students to acquire knowledge on legal aspects of business.
- To enable the students to understand the law of Contract.
- To know the basic concepts of contracts such as Offer, Acceptance and Valid Agreement, etc.,

UNIT – I

Law – Meaning and object – mercantile law meaning – sources of law —classification of contracts – Offer acceptance – Legality of object.

UNIT – II

Consideration – Valid Contract-Void agreement.

UNIT – III

Essentials elements of valid contract.

UNIT – IV

Classification of Contract.

UNIT – V

Modes of discharge of Contract, Breach of of Contract

Text Books:

1.M.C.Kuchhal and Vivek Kucchal:Mercantile Law,Vikas publishing house pvt ltd,8th edition -2013

2.N.D. Kapoor - Elements of Mercantile Law-Revised edition - 2000.

Reference Books:

1.N.D.Kapoor :Business law-Sultan Chand publications Revised edition - 2009.

2.B.S Raman:Business law-United publishers,Revised edition - 2011.

3.ICSI Material-Revised copy

EXTRA CREDIT COURSES : STRESS MANAGEMENT

Subject Code: 16UMCECC11

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, 1st Edition - 2013.*

Reference Books:

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

EXTRA CREDIT COURSE: E-COMMERCE

Subject Code: 16UMCECC12

No. of Credits: 2

Objectives:

4. To provide knowledge about Electronic Commerce.
5. To enable the students understand the technology of e-Commerce for Business Application.
6. To make the student aware of the Techniques in the Application of e-Commerce.

UNIT I

E-commerce – framework – classification of electronic commerce – Anatomy of E-Commerce Applications – components of the I way –network access equipment – internet terminology.

UNIT II

Electronic Data Interchange – Benefits – EDI Legal, Security & privacy issues – DEI software implementation – value added networks – internal information systems – work flow atomization and coordination – customization and internal commerce.

UNIT III

Network security and firewalls – client server network security – emerging client server security threats – firewalls and network security – data and message security – encrypted documents and electronic mail – hypertext publishing – technology behind the web – security and the web.

UNIT IV

Consumer oriented electronic commerce: consumer oriented applications – mercantile process models – mercantile models from the consumer's perspective – mercantile models from the merchant's perspective.

UNIT V

Electronic payment systems – types – digital token based electronic payment system – smart cards & credit card electronic payment systems – risk designing electronic payment.

Text Books:

1. Ravi Kalakota and Andrew B. Whinston: *Frontiers of Electronic Commerce*, Pearson Education, 1st Edition - 2006.
2. Elias M Awand: *Electronic Commerce*, Phi Learning Pvt Ltd, 3rd Edition - 2007.

Reference Books:

1. Daniel Minoli and Emma Minoli: *Web Commerce Technology Handbook*, Tata McGraw Hill Publishing, New Delhi, 1st Edition- 2006.
2. Efrain Turban and David King: *Electronic Commerce*, Pearson Education, 1st Edition- 2009.
3. Pete Loshin: *Electronic Commerce*, Firewall Media, 4th Edition - 2005.

EXTRA CREDIT COURSE: OOPS WITH JAVA PROGRAMMING

Subject Code: 16UMCECC13

No. of Credits: 2

Objectives :

- 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 enviroment 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

Introduction to Object-Oriented Programming : Fundamentals – Object oriented Paradigm – Elements of the OOP – Abstraction – Encapsulation – Modularity – Hierarchy –Concurrency Persistence – Inheritance – Polymorphism – Benefits of OOP – Applications of OOP.

UNIT II

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 - Constants – Variables – Data types – Operators and Expresions.

UNIT III

Decision Making and Branching :if,if...else, nested if, switch – Decesion making and looping : while,do,for – Jumps in Loops – Labeled loops – Classes, Objects and Methods.

Arrays, Strings and vectors - Interfaces :Multiple Inheritance – Packages : Putting classes together – Multithreaded programming – Thread exceptions – Life cycle of Thread - Thread priority – Synchronization.

UNIT IV

Managing Errors and Exceptions – Types of Errors – Exceptions – Applet Programming – Applet life cycle – Graphics Programming.

UNIT V

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, 2nd Edition, Pearson Education.
2. E.BalaGurusamy: Programming with Java, 3rd edition, Tata McGraw Hill Pvt Ltd.

Reference Books:

1. Patrick Naughton & Hebert Schildt: The Complete Reference Java 2nd, 3rd edition, Tata McGraw Hill Pvt Ltd.
2. Programming with Java – John R.Hubbard, 2nd Edition, Tata McGraw