#### Sant Gadge Baba Amravati University Amravati Appendix A1 <u>Scheme of teaching, learning & Examination leading to the Degree Bachelor of Arts (B. A.) (Three Years- Six Semesters Degree Programme - C.B.C.S)</u> (B. A. Part-I) Semester-I

		1						(D. A. Pal	rt-1) Semester-1		1						
							Teaching & Learn	ing Scheme		Duration of Exams Hrs.	Exami	ination & Evaluatio	on Scheme				
Sr.	Subjects	Subject	Teac	hing Pe	eriod P	er week		Credits				Maxin	um Marks			Minimum	Passing
No		Code	L	Т	Р	Total	Theory/ Tutorial	Practical	Total		Theory + M.C.Q External	Skill Enhancement Module Internal	Pra Internal	ectical External	Total Marks	Marks	Grade
1	Compulsory English (DSC -1)		4	-	-	4	3	-	3	3	80	20	-	-	100	40	р
2	Communication Skill in English (AEC)			1		1	0.75		0.75	1	-	-	25	-	25	10	p
3	Second Lang. (DSC -2)		3	-	-	3	2.25	-	2.25	3	80	20	-	-	100	40	р
4	Communication Skill in Second Language (AEC)		-	1	-	1	0.75	-	0.75	1	-	-	25	-	25	10	р
5	(DSC -3) Non Practical Subject		5	-	-	5	4	-	4	3	80	20	-	-	100	40	р
6	( DSC -4) Non Practical Subject		5	-	-	5	4	-	4	3	80	20	-	-	100	40	р
7	( DSC -5) Non Practical Subject		5	-	-	5	4	-	4	3	80	20	-	-	100	40	р
8	(DSC) English literature		6	-	-	6	4.50		4.50	3	80	20	-	-	100	40	р
								Prac	ctical Subjects								
8	Geography/ Home Economics Yogashastra		5	-	-	5	4	-	4	3	60	20	-	-	80	32	р
	Practical		-	-	2	2	-	0.75	0.75	3	-	-	10	10	20	8	р
9	Music		2	-	-	2	1	-	1	3	50	20	-	-	70	28	Р
	Practical		-	-	8	8	-	3	3	3	-	-	20	10	30	12	Р
10	Psychology		4	-	-	4	3	-	3	3	60	20	-	-	80	32	Р
	Practical		-	-	6	6	-	2.25	2.25	3	-	-	10	10	20	8	Р
11	Statistics		5	-	-	5	4	-	4	3	60	20	-	-	80	32	Р
	Practical		-	-	8	8	-	3	6	3	-	-	10	10	20	8	Р
12	Other Practical Subject		4	-	-	4	3	-	3	3	60	20	-	-	80	32	Р
	Practical		-	-	2	2	-	0.75	0.75	3	-	-	10	10	20	8	Р
	Generic Open Elective Course		2	-	-	2	2	-	2	2	50	-	-	-	50	20	
	Induction Programme		30	) Hours	-     2     2     2     30     -     -     -     50       Iours of one week     1     1     Non Exam Credits     -     -     50												

L: Lecture, T: Tutorial, P: Practical

Note: Internship /Field Work / Work Experience will be conducted after I semester till V semester in vacations for minimum 150 hrs. It's credits and grades will be reflected in final semester IV credit grade report. - OEC (Optional) can be studied during semester I to VI, Its credits and grades will be reflected in final semester VI credit grade report

Sant Gadge Baba Amravati University Amravati Appendix A2
<u>Scheme of teaching, learning & Examination leading to the Degree Bachelor of Arts (B. A.) (Three Years - Six Semesters Degree Programme - C.B.C.S)</u>

( <b>B.</b> A)	. Part-I)	Semester-	Π
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							Teaching & Learni	ing Scheme		Duration of Exams Hrs.	of Examination & Evaluation Scheme s. Maximum Marks Minimum						
Sr.	Subjects	Subject	Teacl	hing Pe	eriod Pe	er week		Credits				Maxin	num Marks			Minimum	Passing
No	Subjects	Code					Theory/Tutorial	Practical	Total		Theory + M.C.Q	Skill Enhancement	Pra	ctical	Total Marks	Marks	Grade
			L	Т	Р	Total	Theory, Tutoriar				External	Module Internal	Internal	External			
1	Compulsory English (DSC -1)		4	-	-	4	3	-	3	3 Hours	80	20	-	-	100	40	р
2	Communication Skill in English (AEC)			1		1	0.75		0.75	1	-	-	25	-	25	10	р
3	Second Lang. (DSC -2)		3	-	-	3	2.25	-	2.25	3 Hours	80	20	-	-	100	40	р
4	Communication Skill in Second Language (AEC)		-	1	-	1	0.75	-	0.75	1	-	-	25	-	25	10	р
5	(DSC -3) Non Practical Subject		5	-	-	5	4	-	4	3 Hours	80	20	-	-	100	40	р
6	(DSC -4) Non Practical Subject		5	-	-	5	4	-	4	3 Hours	80	20	-	-	100	40	р
7	(DSC -5) Non Practical Subject		5	-	-	5	4	-	4	3 Hours	80	20	-	-	100	40	р
8	(DSC) English literature		6	-	-	6	4.50		4.50	3 Hours	80	20	-	-	100	40	р
								Pra	ctical Subjects								
8	Geography/ Home Economics Yogashastra		5	-	-	5	4	-	4	3 Hours	60	20	-	-	80	32	р
	Practical		-	-	2	2	-	0.75	0.75	3 Hours	-	-	10	10	20	8	р
9	Music		2	-	-	2	1	-	1	3 Hours	50	20	-	-	70	28	Р
	Practical		-	-	8	8	-	3	3	3 Hours	-	-	20	10	30	12	Р
10	Psychology		4	-	-	4	3	-	3	3 Hours	60	20	-	-	80	32	Р
	Practical		-	-	6	6	-	2.25	2.25	3 Hours	-	-	10	10	20	8	Р
11	Statistics		5	-	-	5	4	-	4	3 Hours	60	20	-	-	80	32	Р
	Practical		-	-	8	8	-	3	6	3 Hours	-	-	10	10	20	8	Р
12	Other Practical Subject		4	-	-	4	3	-	3	3 Hours	60	20	-	-	80	32	Р
	Practical		-	-	2	2	-	0.75	0.75	3 Hours	-	-	10	10	20	8	Р
	Generic Open Elective Course		2	-	-	2	2	-	2	2 Hours	50	-	-	-	50	20	

L: Lecture, T: Tutorial, P: Practical

#### Appendix-B

#### 1. Examination and question pattern of B.A. Degree Programme:- (Semester I to VI)

- Examinations shall be conducted in Offline mode in accordance with Ordinance No. 9. However, under special circumstances and in specific cases, those can be conducted in Online mode on the recommendations of Board of Examination & Evaluation and approval by the Academic Council.
- 2) An examinations shall be held at the end of each semester.
- 3) Question paper of examination shall be in English, Marathi and Hindi as applicable.
- 4) The question bank for theory/subject/paper (MCQ, Long answer, short answer, problems or numerical, computations, design as applicable) except case study should be prepared along with memorandum and solutions of problem.
- 5) Syllabi of respective papers have been divided in to five units for each paper/subject.
- 6) Weightage shall be equal for each unit of the respective paper/subject.
- 7) All questions in the question paper shall be compulsory.

#### Notes :

1) Distribution of Marks of Theory

#### For Non-Practical Subjects :

- a) 60 Marks for Descriptive Type Questions.
- b) 20 Marks for Multiple Choice Questions.
- c) 20 Marks for Skill Enhancement Module.

# For Practical Subjects: (Geography, Psychology, Home – Economics& Functional English)

- a) 40 Marks for Descriptive Type Questions.b) 20 Marks for Multiple Choice Questions
- c) 20 Marks for Practical
- d) 20 Marks for Skill Enhancement Module.

#### For Practical Subjects : (Music)

- a) 30 Marks for Descriptive Type Questions.
- b) 20 Marks for Multiple Choice Questions
- c) 30 Marks for Practical
- d) 20 Marks for Skill Enhancement Module.
- The students once offered the subjects under Discipline Specific Core (DSC) in first Semester, it shall be continued from Semester-II to V & once the subject offered under DSC shall be continued under DSE in VI Semester.
- 3) There shall be Five Units (Four units for theory & 1 unit for SEM) / Questions of 12 Marks for Theory Subjects & 5 units / Questions of 8 Marks for Practical Subjects
- 4) M.C.Q.  $4 \times 5$ , Skill Module  $4 \times 5$ , Practical  $4 \times 5$
- A) The Executive Council dated <sup>1</sup>/<sub>2</sub>-4-1977 has prescribed the Teaching Periods in the various subjects as follows.

#### i) English (Compulsory):

For B.A.I,II and Final Examinations: 4 Lecture periods and 1 tutorial for a batch of 20 students per week. A batch will not exceed 20 by more than 10% of 20.

ii English Literature : B.A.Part I, II and Final : 6 periods per week.

#### iii) Supplementary English :

B.A.Part I : 3 Periods per week ; B.A.Parts II & Final : 4 Periods Per Week

- iv) Compulsory Languages : (Marathi, Hindi, Sanskrit, Urdu and Pali & Prakrit) B.A.Part-I : 4 Periods per Week; B.A.Part-II: 4 Periods per Week; B.A.Final : 4 Periods per Week
   c) Ontional Longuages : (Marathi Litt, Urind Litt, and Sanshrit Litt, and San
- v) Optional Languages : (Marathi Litt., Hindi Litt., and Sanskrit Litt. etc.) B.A.Part-I, II and Final : 5 Periods per Week
- vi) Subjects in the Faculty of Social Sciences where no Practicals are prescribed : B.A.Part-I, II and Final : 5 Periods per Week

#### B) SUBJECTS WHERE PRACTICALS ARE PRESCRIBED FOR B.A. PART-I, II AND FINAL.

- i) **Music :** 6 Practical and 2 theory periods. The number of students should not exceed 7 per batch for practical.
- ii) **\*\*Geography : 5** lectures and 1 practical of 2 periods per week . The number of students should not exceed 16 per batch for Practical.
- iii) \*Psychology : 4 theory periods and 3 Practical per week per batch of 16 students and 1 periods for Statistics per week.
- iv) **\*\*Home Economics : 5** Lectures and 1 Practical of 2 Periods per Week for a batch of 16 students.
- v) Statistics : For B.A. Part-I : 5 theory lectures and 4 Practical Periods (2 Periods each per week)
- vi) Statistics : For B.A. Part-II and Final : 5 Theory Lectures and 6 Practical Periods per week.
- vii) Mathematics : B.A. Part-I II and Final : 9 Theory Periods and 1 Tutorial for a batch of 20 students per Week.

\*As modified by the Executive Council dated 27/28-4-1979

\* As modified by the Executive Council dated 22-9-1977

\* As per letter Nos. NGC/3299/ताबि/अबि/४१४६५/मबि-२& NGC/3299 ताबि/अबि/४६९०९/अबि मबि-२dated 5.7.1999 & 24.1.2000 respectively received from Director of Education (Higher Education) Pune and approved / noted by the Academic Council meeting dated 5.6.99 & 11.4.2000 vide Item No. 33 & 33 respectively.

Note:\*\* As accepted by the Academic Council Dt. 6.5.2015 Vide Noti.No.24 & 25 /2016 in Gaz. .Part- Two

C) i) Academic Council in its meeting held on 6.5.2015 Vide Item No. 39 has approved to increase in the existing work load i.e. from "4 lectures and 1 Practical of 2 Periods per week to 5 lectures and 1 Practical of 2 Periods per week" for the subject Home Economics at graduate level.

ii) Academic Council in its meeting held on 6.5.2015 Vide item No. 40 & 41 has approved to reduce the existing intake capacity for practical batch from 20 to 16 students for Home Economics & Geography subject.

<sup>\*\*\*\*</sup> 

Sant Gadge Baba Amravati University Amravati

Scheme of teaching, learning & Examination leading to the Degree Bachelor of Commerce (Three Years -Six Semesters Degree Course- C.B.C.S) (B. Com Part-I)Semester- I

	Teaching & Learning Scheme     Duration of																
					Те	eaching of	& Learning S	cheme		Duration of Exams Hrs.		]	Examinati	on & Evalua	ation Scheme	е	
			Teachi	ing Pe	riod P	er week		Credits	5			N	laximum	Marks		Minin Pass	num sing
Sr. No	Subjects	Subject Code					Theory/ Tutorial	Practical	Total		Theory + M.C.Q	Skill Enhancement	Pra	octical	Total Marks	Marks	Grade
			L	Т	Р	Total					External	Module Internal	Interna l	External			
1	English (DSC)	BC-11	04	-	-	04	03	-	03	03	60+20	20	-	-	100	40	р
2	Business Communication Skill in English (AEC)	BC-11		1	-	01*	01	-	01	-	-	-	25	-	25	10	р
3	LANG-II (DSC)	BC-12	03	-	-	03	03	-	03	03	60+20	20	-	-	100	40	р
4	Communication Skill in Language-II (AEC)	BC-12	-	1	-	01	01		01	-	-	-	25	-	25	10	р
5	Principle of Accountancy (DSC)	BC-13	05	-	-	05	04	-	04	03	60+20	20	-	-	100	40	р
6	Principles of Business Economics (DSC)	BC-14	05	-	-	05	04	-	04	03	60+20	20	-	-	100	40	Р
7	Principles of Business Management (DSC)	BC-15	04	-	-	04	04	-	04	03	60+20	20	-	-	100	40	Р
8	Computer Fundamental & Operating System I (DSC)	BC-16	03	-	-	03	03	-	03	03	40+20		-	-	60	24	Р
9	Computer Fundamental & Operating System I (Practical) (DSC)	BC-16	-	-	1	01	-	01	01	-	-	-	-	40	40	16	Р
10	Generic Open Elective Course (GEOC)	BC-17	02	-	-	02	02	-	02		College Lev	el Evaluation			50	20	Р
11	Induction Programme	30 Hrs (one V seme	Veek) at ester one	the beg only	ginning				01								
	Total					30			28						700		

L: Lecture, T: Tutorial, P: Practical

\* Regular Teaching for Compulsory English-04 periods/wk, 01 Tutorial /wk for a batch of 20 students

Sant Gadge Baba Amravati University Amravati

Scheme of teaching, learning & Examination leading to the Degree Bachelor of Commerce (Three Years ... Six Semesters Degree Course- C.B.C.S)

								(B. Com P	art-1)Sen	nester-11							
						Teachi	ng & Learnin	g Scheme		Duration of Exams Hrs.		]	Examinati	on & Evalua	tion Schei	me	
Sr.	Subjects	Subject Code	Te	aching V	g Perio veek	od Per		Credi	ts			Ma	aximum N	<b>farks</b>		Mi	nimum Passing
No				n		_	Theory/ Tutorial	Practical	Total		Theory + M.C.Q	Skill Enhancement	Pra	actical	Total Marks	Marks	Grade
			L	Т	Р	Total					External	Module Internal	Internal	External			
1	English (DSC)	BC-21	04	-	-	04	04		04	03	60+20	20	-	-	100	40	р
2	Business Communication Skill in English (AEC)	BC-21	-	1	-	01*	01	-	01	-	-		25	-	25	10	р
3	LANG-II (DSC)	BC-22	03	-	-	03	03	-	03	03	60+20	20	-	-	100	40	р
4	Communication Skill in LANG-II (AEC)	BC-22	-	1	-	01	01	. <u> </u>	01	-		-	25	-	25	10	р
5	Financial Accounting (DSC)	BC-23	05	-	-	05	04	-	04	03	60+20	20			100	40	р
6	Business Economics (DSC)	BC-24	05	-	-	05	04	-	04	03	60+20	20			100	40	р
7	Principles of Business Organization (DSC)	BC-25	04	-	-	04	04	-	04	03	60+20	20	-	-	100	40	р
8	Computer Fundamental Operating System II(DSC)	BC-26	03	-	-	03	03	-	03	03	40+20	-	-	-	60	24	р
9	Computer Fundamental &Operating System II Practical (DSC)	BC-26	-	-	1	01		01	01				-	40	40	16	p
10	Generic Open Elective II- (GOEC)	BC-27	2	-	-	2	2		2		College Level Evaluation 50 20 p					р	
	Total					29			27					700			

L: Lecture, T: Tutorial, P: Practical

\* Regular Teaching for Compulsory English-04 periods/wk, 01 Tutorial /wk for a batch of 20 student

#### Examinations leading to the Degree of Bachelor of Science <u>Three Years (Six Semesters) Degree Programme under Choice Based Credit System (CBCS)</u> Scheme of Teaching, Learning, Examination and Evaluation (B.Sc. Semester I-Mathematics) (Semester-I)

							Teaching & Lea	arning Scheme		Duration of Exams	on of Examination & Evaluation Scheme						
Sr. No	Subject	Subject Code	Teach	ing Pe	riod Po	er week			Credits	Hrs.		Max	imum Marks	5		Minim Passi	um ing
			т	т	D	Total	Theory/ Tutorial	Practical	Total		Theory + M.C.Q	Skill Enhancement Module (SEM)	Prac	ctical	Total Marks	Marks	Grade
			L	1	Р						Ext.	Int.	Internal	External			
1	Compulsory English		4	-		4	3	-	3	3	40	10	-	-	50	20	Р
2	Communication Skill in English (AEC)		-	1	-	1	0.75	-	0.75	1			25	-	25	10	Р
3	Second Language		2	-	-	2	1.5	-	1.5	3	40	10	-	-	50	20	Р
4	Communication Skill in Second Language (AEC)		1	-	-	1	0.75	-	0.75	1			25	-	25	10	Р
5	Mathematics, (DSC-1)		4	1	-	5	3.75	-	3.75	3	60	15	-	-	75	30	Р
6.	Mathematics (DSC-2)		5	-	-	5	3.75	-	3.75	3	60	15	-	-	75	30	Р
7.	Science Subject 1 excluding Mathematics (DSC-3)		6	-	-	6	4.5	-	4.5	3	80	20	-	-	100	40	Р
8.	Practical for Science Subject 1 (DSC-3) excluding Mathematics (DSC-4)		-	-	6	6		2.25	2.25	3	-	-	25	25	50	25	Р
9	Science Subject 2 excluding Mathematics (DSC-5)		6	-	-	6	4.5	-	4.5	3	80	20	-	-	100	40	Р
10	Practical for Science Subject 1 (DSC- 5) excluding Mathematics (DSC-6)		-	-	6	6		2.25	2.25	3	-	-	25	25	50	25	Р
11	Generic Elective I (GOEC)		2	-	-	2	2	-	2	2	Colleg	e Level examination			50	20	р
12	Induction Programme*					30 hrs	(at the beginning	of 1 <sup>st</sup> Semester)	1		10 р			Р			
	Total					44			30						650		

L: Lecture, T: Tutorial, P: Practical

Note :1. Internship /Field Work / Work Experience will be conducted after I semester till V semester in vacations for minimum 150 hrs. It's credits and grades will be reflected in final semester IV credit grade report. - OEC (Optional) can be studied during semester I to VI, Its credits and grades will be reflected in final semester VI credit grade report

2. Teaching period in the various subjects in the faculty of science shall be as prescribed by the executive council dated 1/2-4-1977, 11-7-1977 Appendix- P

3. If DSC (excluding Mathematics) is Physics, then 1 Tutorial be added.

#### Examinations leading to the Degree of Bachelor of Science

#### Three Years (Six Semesters) Degree Programme under Choice Based Credit System (CBCS) Scheme of Teaching, Learning, Examination and Evaluation (B.Sc. Semester II -Mathematics) (Semester-II)

							Teaching & Lea	arning Scheme		Duration of Exams	Duration of Examination & Evaluation Scheme Exams Hrs Minimum						
Sr. No	Subject	Subject Code	Teach	ning Pe	eriod P	er week			Credits	Hrs.		Max	kimum Marks	5		Minim Passi	um ing
			Ţ		D	Total	Theory/ Tutorial	Practical	Total		Theory + M.C.Q	Skill Enhancement Module (SEM)	Pra	ctical	Total Marks	Marks	Grade
			L	Т	Р						Ext.	Int.	Internal	External			
1	Compulsory English		4	-		4	3	-	3	3	40	10	-	-	50	20	Р
2	Communication Skill in English (AEC)		-	1	-	1	0.75	-	0.75	1			25	-	25	10	Р
3	Second Language		2	-	-	2	1.5	-	1.5	3	40	10	-	-	50	20	Р
4	Communication Skill in Second Language (AEC)		1	-	-	1	0.75	-	0.75	1			25	-	25	10	Р
5	Mathematics, (DSC-7)		4	1	-	5	3.75	-	3.75	3	60	15	-	-	75	30	Р
6.	Mathematics (DSC-8)		5	-	-	5	3.75	-	3.75	3	60	15	-	-	75	30	Р
7.	Science Subject 1 excluding Mathematics (DSC-9)		6	-	-	6	4.5	-	4.5	3	80	20	-	-	100	40	Р
8.	Practical for Science Subject 1 (DSC-9) excluding Mathematics (DSC-10)		-	-	6	6		2.25	2.25	3	-	-	25	25	50	25	Р
9	Science Subject 2 excluding Mathematics (DSC-11)		6	-	-	6	4.5	-	4.5	3	80	20	-	-	100	40	Р
10	Practical for Science Subject 1 (DSC- 11) excluding Mathematics (DSC- 12)		-	-	6	6		2.25	2.25	3	-	-	25	25	50	25	Р
11	Generic Elective II (GOEC)		2	-	-	2	2	-	2	2	College Le	evel examination			50	20	р
	Total					44			29						650		

L: Lecture, T: Tutorial, P: Practical

Note: 1. 1. Internship /Field Work / Work Experience will be conducted after I semester till Vth semester in vacations for minimum 150 hrs. It's credits and grades will be reflected in final semester IV credit grade report. - OEC (Optional) can be studied during semester I to VI, Its credits and grades will be reflected in final semester VI credit grade report

2. Teaching period in the various subjects in the faculty of science shall be as prescribed by the executive council dated <u>1/2</u>-4-1977, 11-7-1977 Appendix- P

3. If DSC (excluding Mathematics) is Physics, then 1 Tutorial be added.

Annexure – A2

#### APPENDIX – A1

#### Examinationsleading to the Degree of Bachelor of Science

# Three Years(SixSemesters) DegreeProgramme underChoiceBasedCredit System(CBCS) SchemeofTeaching,Learning,ExaminationandEvaluation(B.Sc.SemesterI-ExcludingMathematics)(Semester-I)

							Teaching&Lea	arningScheme		Duration ofExams	ion Examination&EvaluationScheme xams Minimum						
Sr.No	Subject	SubjectCode	Teach	ingPe	riodP	er week			Credits	Hrs.		Ma	ximum Marks	s		Minim Passi	um ng
			L	Т	Р	Total	Theory/ Tutorial	Practical	Total		Theory + M.C.Q Ext.	Skill Enhancement Module (SEM) Int.	Pra	ctical	Total Marks	Marks	Grade
1	CompulsoryEnglish		4	-		4	3	-	3	3	40	10	-	-	50	20	Р
2	Communication Skill in English(AEC)		-	1	-	1	0.75	-	0.75	1			25	-	25	10	Р
3	Second Language		2	-	-	2	1.5	-	1.5	3	40	10	-	-	50	20	Р
4	Communication Skill in SecondLanguage(AEC)		1	-	-	1	0.75	-	0.75	1			25	-	25	10	Р
5	(DSC-1)		6	-	-	6	4.5	-	4.5	3	80	20	-	-	100	40	Р
6.	Practicalfor(DSC-1),DSC-2		-	-	6	6	-	2.25	2.25	3	-	-	25	25	50	25	Р
7.	(DSC-3)		6	-	-	6	4.5	-	4.5	3	80	20	-	-	100	40	Р
8.	Practicalfor(DSC-3),(DSC-4)		-	-	6	6	-	2.25	2.25	3	-	-	25	25	50	25	Р
9	(DSC-5)		6	-	-	6	4.5	-	4.5	3	80	20	-	-	100	40	Р
10	Practicalfor(DSC-5)-(DSC-6)		-	-	6	6	-	2.25	2.25	3	-	-	25	25	50	25	Р
11	GenericElectiveI(GOEC)		2	-	-	2	2	-	2	2	CollegeLev	velexamination			50	20	р
12	InductionProgramme*					30 hrs(at thebeg	ginningof1 <sup>st</sup> Semes	ter)	1							10	Р
	Total					46			29.25(roundedoff to29)						650		

L:Lecture,T:Tutorial,P:Practical

Note :1.1.Internship /Field Work / Work Experience will be conducted after I semester till Vthsemester in vacations for minimum 150 hrs. It's credits and grades will be reflected infinal semesterIV credit grade report.- OEC (Optional) can be studied duringsemester ItoVI,Itscreditsandgrades willbereflected infinalsemesterVIcreditgradereport

2. Teaching period in the various subjects in the faculty of sciences hall be a sprescribed by the executive council dated 1/2-4-1977, 11-7-1977 Appendix-P and the science of the scien

3. IfDSC(excludingMathematics)isPhysics,then1Tutorial beadded.

#### Examinationsleading to the Degree of Bachelor of Science

#### A2.2Three Years(SixSemesters) DegreeProgramme underChoiceBasedCreditSystem(CBCS) SchemeofTeaching,Learning,ExaminationandEvaluation(B.Sc.SemesterII-ExcludingMathematics)(Semester-II)

							Teaching&Lea	arningScheme		Duration ofExams			Examinatio	n&Evaluation	nScheme		
Sr.No	Subject	SubjectCode	Teach	ningPe	eriodP	er week			Credits	Hrs.		Max	timum Marks	5		Minim Passi	um ng
						Total	Theory/ Tutorial	Practical	Total		Theory + M.C.Q	Skill EnhancementMod	Prac	ctical	Total Marks	Marks	Grade
			L	Т	Р						Ext.	ule(SEM)Int.	Internal	External			
1	CompulsoryEnglish		4	-		4	3	-	3	3	40	10	-	-	50	20	Р
2	Communication Skill in English(AEC)		-	- 1	-	1	0.75	-	0.75	1			25	-	25	10	Р
3	Second Language		2	-	-	2	1.5	-	1.5	3	40	10	-	-	50	20	Р
4	Communication Skill in SecondLanguage(AEC)		1	- 1	-	1	0.75	-	0.75	1			25	-	25	10	Р
5	(DSC-7)		6	-	-	6	4.5	-	4.5	3	80	20	-	-	100	40	Р
6.	Practicalfor(DSC-7),DSC-8		-	-	6	6	-	2.25	2.25	3	-	-	25	25	50	25	Р
7.	(DSC-9)		6	-	-	6	4.5	-	4.5	3	80	20	-	-	100	40	Р
8.	Practicalfor(DSC-9), (DSC-10)		-	-	6	6	-	2.25	2.25	3	-	-	25	25	50	25	Р
9	(DSC-11)		6	-	-	6	4.5	-	4.5	3	80	20	-	-	100	40	Р
10	Practicalfor(DSC-11)-(DSC-12)		-	-	6	6	-	2.25	2.25	3	-	-	25	25	50	25	Р
11	GenericElectiveII(GOEC)		2	-	-	2	2	-	2	2	CollegeLe	velexamination			50	20	р
	Total					46			28.25(roundedoff to28)						650		

L:Lecture,T:Tutorial,P:Practical

Note: 1.1.Internship/FieldWork/WorkExperiencewillbe conductedafterIsemestertillVthsemester invacationsforminimum150hrs.It'screditsandgradeswill bereflectedinfinalsemesterIVcreditgradereport.-OEC(Optional)canbestudiedduringsemester ItoVI,Itscreditsandgrades willbereflected infinalsemesterVIcreditgradereport

 $\label{eq:constraint} \textbf{2. Teachingperiodinthevarious subjects in the faculty of sciences hall be a sprescribed by the executive council dated 1/2-4-1977, 11-7-1977 Appendix-P and the science of the$ 

3. IfDSC(excludingMathematics)isPhysics,then1Tutorial beadded.

# Sant Gadge Baba Amravati University, Amravati Syllabus Prescribed under Choice based Credit System 2022-23 Faculty : Humanities Programme: M.A. (English) Part A

#### **PROGRAMME OUTCOME (POs)**

- 1) To educate students in English literary and critical writing with a view to enable them to probe literary & critical theories & contexts that require substantive expertise in literature.
- 2) To develop and foster ideological sense and a sense of social awareness and cultural understanding.
- 3) To acquire proficiency in expression skills and critical thinking skills through exposure to various forms & genre of writing.
- 4) To develop research, critical and analytical attitude & approach in the students.
- 5) To help emerge social thinkers & critics who can take up a study of various social problems and issues that ail the society and impede social change and progress and contribute to the process of social transformation and social progress.
- 6) To help grow great leaders, thinkers, artists, visionaries, pundits / experts, educationists, managers, consultants, guides, coaches, social analysts, reformers, social activists, social pleaders & crusaders, think-tanks, journalists, critical and creative writers professionally in various fields of knowledge.

## **COURSE OUTCOMES (COs)**

- 1) The students would acquire critical attitude and approach and gain knowledge, intellectual competence and critical scholarship which would help them to improve their performance in competitive exams like MPSC/UPSC/NET/SET in the subject.
- 2) The student will be able to understand and apply the evocative power of language and would be able to apply critical insight and judgment to form an informed and impactful opinion.
- 3) The Student will be fairly acquainted with the background and socio-political as well cultural background of the poets and understand the factors behind their making and evolution. The student will grasp the distinctive writing style and technique of various poets & creative writers.
- 4) The student will acquire enhanced sensibility and emotional depth and maturity in his/her expression.
- 5) The student will understand the socio-political and cultural importance of Literature and Literary Criticism.
- 6) The Course would help emerge social thinkers & critics who can take up various social problems and issues that ail the society and impede social change and progress and thus to achieve social transformation and social progress.

#### **EMPLOYMENT POTENTIAL**

The programme aims to enable the students in developing ways of expression in a variety of forms & texts. It would provide them number of novel Employment and commercial opportunities in the Writing & Publishing field along with equipping them to meaningfully and substantially contribute to intellectual debates, social and public discourse and social & industrial movements. As it aims to build and boost the imaginative and critical thinking skills and potential of the students, it can be very usefully and fruitfully utilised in the Print & Social Media,

Advertising, Film & Entertainment Industry etc. if suitably supplemented with other related specialisation and knowledge. With scope for development of leadership quality & managerial skills, there is a good possibility to apply literary & critical thinking ability and soft skills acquired through this Course to a great effect in the fields of Management, Art & Culture, Fashion, Archaeology, General Administration as well as in the NGOs and Socio-political fields. Its lofty vision is to produce influential literati such as social thinkers, historians, eminent critics & commentators who can take up a deep and serious study and exploration of various social & industrial problems and issues that impede the process of wholesome social change and progress. Through erudition, observation, Research & Analysis, the Course study can help predominant spread of social understanding & awareness towards achieving the sublime goal of overall social transformation and Nation-building.

# Part-B

# Syllabus Prescribed under Choice based Credit System 2022-23 Faculty : Humanities Programme: M.A. (English) SEMESTER-I

Sr.	Course Title	Course	Course Code
No.		Category	
1	History of English Literature –	DSC	DSCENG101
	1		
2.	Literary Criticism – 1	DSC	DSCENG102
3.	Poetry – 1	DSE	DSEENG103
4.	Drama – 1	DSE	DSEENG104
5.	Fiction	DSE	DSEENG105

## SEMESTER-II

Sr.	Course Title	Course	Course Code
110.		Category	
1	History of English Literature –	DSC	DSCENG201
	П		
2	Literary Criticism – II	DSC	DSCENG202
3.	Poetry – II	DSE	DSEENG203
4.	Drama – II	DSE	DSEENG204
5.	Non Fiction	DSE	DSEENG 205
6.	Practical Criticism	OEC-GIC	GICENG206

#### NOTE-

In Semester I & II, Paper I and Paper II are Core/Compulsory papers (denoted by the DSC). Out of the remaining Electives papers (denoted by the DSE), the student is required to choose any TWO Elective papers of their choice for the Exams.

## Programme: M.A. English

#### Semester 1

Code of the Course/Subject	Title of the Course/Subject	Total Number of Periods	Credits
DSCENG101	History of English	60	04
History of English Literature-1	Literature -1 (DSC)		

## Programme Specific Outcomes (PSOs-1) -

- 1) To develop a sense of history through understanding of major traditions, trends, conventions, fashions as well as social developments.
  - 2) To facilitate insight into social norms and culture that the causes and consequences of human actions and dispositions.
  - 3) To study the emergence and development of Renaissance and its influence on the English society.
  - 4) To assimilate the values and principles that lead to progress and social well-being

## **UNIT-WISE SYLLABUS-**

UNIT	TOPIC/CONTENT	Periods
1.	English Literature before Chaucer; The Age of Chaucer, The	20
	Fifteenth Century	
2.	The early Renaissance; The Flowering of Renaissance, its	20
	influence on English drama and verse	
3.	The Age of Shakespeare – Poetry, Prose, Drama; Post	20
	Shakespearean Drama	

#### **Course Outcome (Cos-1):**

- 1) To gain critical understanding and insight into the phenomenon of Renaissance
- 2) Understanding the factors behind the emergence of Shakespeare as a great dramatist
- 3) To critically analyse the chronology of events that led to the rise and glory of Elizabethan Literature
- 4) To improve one's performance in competitive exams like MPSC/UPSC/NET/SET

# **Recommended Reading:**

- 1) Legouis and Cazamian: History of English Literature J.M. Dent & Sons Ltd. 1965
- 2) Crompton- Rickett, Arthur A History of English Literature
- 3) Hudson, W.H: An Outline History of English Literature
- 4) Sampson George: The Concise Cambridge History of English Literature

#### **Question Paper Pattern with Distribution of Marks & Marking Scheme:**

- There shall be *Four* Questions in the Question Paper and all the questions are Compulsory
- The first question will have A and B sections. A Section comprises of Short Notes. Three Short Notes will have to be attempted out of Six each carrying 05 marks. In the section B, there shall be *five* (05) general *Multiple Choice Objective-type Questions* (MCQs) each carrying one (01) mark.
- The Second Question in the Question Paper will be a Long Answer Question(LAQ) based on Unit I with an Internal Choice carrying 20 marks.
- The Third Question in the Question Paper will be a Long Answer Question(LAQ) based on Unit II with an Internal Choice carrying 20 marks.

• The Fourth Question in the Question Paper will be a Long Answer Question(LAQ) based on Unit III with an Internal Choice carrying 20 marks.

# <u>Abstract</u>

1st Question on A section having Short Notes 03 out of 06 (05 marks	each) – 15 Marks and
B section contains MCQs (01 mark each) -	05 Marks
	Total 20 Marks
2 <sup>nd</sup> LAQ based on Unit -1 with an internal Choice carrying	20 Marks
3rd LAQ based on Unit -2 with an internal Choice carrying	20 Marks
4 <sup>th</sup> LAQ based on Unit -3 with an internal Choice carrying	20 Marks

Total = 80 Marks

Distribution of Marks for Internal Assessment		20 Marks
Maximum Marks	Assignment	Seminar with PPT/Viva voce/Study Tour with Report presentation
20	10	10

## Programme: M.A. English

#### Semester 1

Code of the Course/Subject	Title of the Course/Subject	Total Number of Periods	Credits
DSCENG102	Literary Criticism – 1	60	04
Literary Criticism – 1			

# Programme Specific Outcomes (PSOs- 2)

- 1) To enhance aesthetic understanding
- 2) To develop critical, analytical and logical thinking and judgment
- 3) To grasp and assimilate critical temper and insight
- 4) To appreciate and analyse critical texts and documents
- 5) To apply logic and sense of discrimination in decision-making

# **UNIT-WISE SYLLABUS-**

UNIT	TOPIC/CONTENT	Periods
1.	i) Plato: Republic (Book- X) and Ion	20
	ii) Aristotle: Poetics (Chapter No. 1, 2, 3,	
	4,5,6,7,8,9,23,24,25,26) Translated by S.H. Butcher	
2.	i) Horace: Ars Poetica	20
	iii) Loginus: On the Sublime	
3.	i) John Dryden: An Essay of Dramatic Poesy	20
	ii) Alexander Pope: An Essay of Criticism (Part I & Part II)	

# **Course Outcome (Cos-2):**

- 1) To be able to write critical review
- 2) To analyse and interpret texts
- 3) To compare and contrast different ideas
- 4) To apply critical sense and judgment to form an informed opinion
- 5) Acquisition of critical attitude

# **Recommended Reading:**

David Lodge: Modern Criticism and Theory (Longman:2008) with ISBN- 978-0582784543 0r ISBN-10:0582784549

Lodge, David and Nigel Wood eds. 1998. Modern Criticism and Theory: A Reader. Essex: Pearson Education Limited

Raman Selden: The Theory of Criticism: From Plato to the Present (Reader) Paperback: 1988 David Lodge: Twentieth Century Literary Criticism: A Reader (Paperback – 1972) Nagarajan, M.S *English Literary Criticism and Theory* Orient Blackswan Pvt. Ltd., 2012

# Question Paper Pattern with Distribution of Marks & Marking Scheme for :

- There shall be *Four* Questions in the Question Paper and all the questions are Compulsory
- The first question will have A and B sections. A Section comprises of Short Notes. Three Short Notes will have to be attempted out of Six each carrying 05 marks. In the section B, there shall be *five* (05) general *Multiple Choice Objective-type Questions* (MCQs) each carrying one (01) mark.
- The Second Question in the Question Paper will be a Long Answer Question(LAQ) based on Unit I with an Internal Choice carrying 20 marks.

- The Third Question in the Question Paper will be a Long Answer Question(LAQ) based on Unit II with an Internal Choice carrying 20 marks.
- The Fourth Question in the Question Paper will be a Long Answer Question(LAQ) based on Unit III with an Internal Choice carrying 20 marks.

# **Abstract**

$1^{st}$ Question on A section having Short Notes 03 out of 06 (05 marks each) $-$ 15 Marks and		
B section contains MCQs (01 mark each) -	05 Marks	
_	Total 20 Marks	
2 <sup>nd</sup> LAQ based on Unit -1 with an internal Choice carrying	20 Marks	
3rd LAQ based on Unit -2 with an internal Choice carrying	20 Marks	
4 <sup>th</sup> LAQ based on Unit -3 with an internal Choice carrying	20 Marks	

Total: 80 Marks

# Distribution of Marks for Internal Assessment -

Maximum Marks	Assignment	Seminar with PPT/Viva voce/Study Tour with Report presentation
20	10	10

#### Programme: M.A. English

#### Semester 1

Code of the Course/Subject	Title of the Course/Subject	Total Number of Periods	Credits
DSEENG103	Poetry – 1 (DSE)	60	04
Poetry – 1 (DSE)			

## **Programme Specific Outcomes (PSOs- 3)**

- 1) To enhance artistic sensibility for word-music and critical appreciation of Poetry as an Art.
- 2) To develop fertile imaginativeness and emotional depth and maturity.
- 3) To perceive subtle nuances and shades of meaning in the use of language.
- 4) To appreciate and assimilate suggestive and pictorial quality of language.
- 5) To sharpen artistic and critical skills with better grasp and acquisition of qualities like picturesqueness, terseness, conciseness, accuracy, aptness, freshness *etc.* in expression.
- 6) To explore the subjective nature of Truth and Beauty.

# UNIT-WISE SYLLABUS-

UNIT	TOPIC/CONTENT	Periods
	i) Geoffrey Chaucer: <i>Prologue to the Canterbury Tales (Lines</i>	20
	<i>42; 165-207; 411-528)</i>	
1.	ii) William Shakespeare: Sonnet 1: 'From fairest creatures we	
	desire increase'; Sonnet 18: Shall I compare thee to a summer's day?'. Sonnet 116: 'Let me not to the marriage of	
	true minds'; Sonnet 144: 'Two loves I have of comfort and	
	despair'	
	iii) John Milton: a) Lycidas; b) On his Blindness; c) On	
	Shakespeare d) Song on May Morning	
	i) John Donne: a) The Extasie b) The Canonization c) Death,	20
2.	Be Not Prova a) valeation- Forblaating Mourning	
	ii) Andrew Marvell: a)The Garden; b)On a Dew Drop; c)The	
	Definition of Love; d)Young Love	
	iii) Samuel Butler: An Heroic Epistle of Hudribas to His Lady	
	i) John Dryden: Macflecknoe	20
3.	ii) Alexander Pope: The Rape of the Lock	
	<ul><li>iii) Thomas Gray: i)Elegy written in the Country Churchyard</li><li>ii)Ode on the Spring</li></ul>	
	, I U	

## **Course Outcomes (Cos-3)**

- 1. The Student will be able to critically appreciate and interpret a piece of poetic work.
- 2. The Student will be fairly acquainted with the background and socio-political as well cultural background of the poet and understand the factors behind his making and evolution.

- 3. The student will grasp the distinctive poetic style and technique of various poets.
- 4. The student will understand the socio-political and cultural importance of Poetry and Poetic art.
- 5. The student will be able to quote the memorable quotations in his speech and writing.
- 6. The student will be able to understand and apply the evocative power of language.7. The student will understand and appreciate the subjective nature of Truth and Beauty.
- 8. The student will acquire enhanced sensibility and emotional depth and maturity in his/her expression.

## **Recommended Reading/ Sources:**

1) English Poetry From Elizabethans to the Restoration; An

- Anthology, Edited by Pramod K. Nayar, Orient Blackswan Publication
- 2) The Making of a Poem by Earon Boland
- 3) The Force of Poetry by Christopher Rick; Clarendon Press
- 4) Theory of Lyric by Jonathan Culler Harvard University Press
- 5) This is Shakespeare: How to Read the world's Greatest Playwright by Emma Smith; Pelican publishers,
- 6) www.ListMuse.com
- 7) https://interestingliterature.com
- 8) https:/www.poetryfoundation.org

## Distribution of Marks with Marking Scheme:

- There shall be Four Questions in the Question Paper and all the questions are Compulsory
- 1st Question will be of 'Reference to Context' on the Texts prescribed. There shall be 08 • stanzas for explanation out of which Four have to be attempted each carrying 05 marks.
- 2<sup>nd</sup> question in the question paper will have A and B sections. A Section comprises of Short Notes. Two Short Notes will have to be attempted out of Four each carrying 04 marks to test the students acquaintance with the poets and their works and general as well as conceptual understanding of their background and their intellectual positions. In the section B, There shall be 07 general *Multiple Choice Objective-type Questions* (MCQs) based on the poets and their background.
- The Third Question in the Question Paper will be a Long Answer Question(LAQ) based • on Unit I with an Internal Choice carrying 15 marks.
- The Fourth Question in the Question Paper will be a Long Answer Question(LAQ) based • on Unit II with an Internal Choice carrying 15 marks.
- The Fourth Question in the Question Paper will be a Long Answer Question(LAQ) based • on Unit III with an Internal Choice carrying 15 marks.

#### Abstract

1 <sup>st</sup> Question RTC 4 out of 8 (05 marks each) - <i>Tot</i>	al 20 Marks
2 <sup>nd</sup> Question A section Short Notes 02 out of 04 (04 marks each)	– 08 Marks and
B section MCQs (01 mark each) -	07 Marks
Tota	al <i>15 Marks</i>
3 <sup>rd</sup> LAQ based on Unit -1 with an internal Choice carrying	15 Marks
4 <sup>th</sup> LAQ based on Unit -2 with an internal Choice carrying	15 Marks
5 <sup>th</sup> LAQ based on Unit -3 with an internal Choice carrying	15 Marks
Total =	80 Marks

Distribution of Marks for Internal Assessment

Maximum Marks	Assignment	Seminar with PPT/Viva voce/Study Tour with Report presentation
20	10	10

#### Programme: M.A. English

## Semester 1

Code of the	Title of the	Total Number of	Credits
Course/Subject	Course/Subject	Periods	
DSEENG104 Drama – 1 (DSE)	Drama – 1 (DSE)	60	04

#### **Programme Specific Outcome (PSOs-4):**

- 1) To enhance artistic sensibility for word-music and critical appreciation of Dramatic art.
- 2) To understand various dramatic types and the origin of the English drama.
- 3) To explore and appreciate the wonder and magic of Renaissance Drama and the greatness of Shakespearean dramatic art.
- 4) To understand and assimilate the laws and principles of dramatic composition.
- 5) To acquire insight and understanding of the mysteries and ironies of human life.

#### UNIT-WISE SYLLABUS -

Section	UNIT		Periods
		<b>TOPIC / CONTENT</b>	
	Section A (Literary Background)		
Text Pres	scribed: A	Background to the study of English Literature (Revised	
		Edition) by B. Prasad	
		Chapter I – The Dramatic Art	10
	1	Chapter II – Dramatic Types	
А.	1.	Chapter IV- Origin of the English Drama	
		Chapter V - Notes on Shakespeare:- Shakespearean	
		Comedy; Shakespearean Tragedy; Shakespearean	
		Romance	
		Section B (Literary Texts / Plays)	
		i) Christopher Marlowe : Dr. Equatus	25
		1) Christopher Warlowe . Dr. Faustus	25
	2.	ii) Ben Jonson : The Alchemist	
B.		iii) John Webster : The Duchess of Malfi	
		William Shakespeare: i) <i>Othello;</i>	25
	3	ii) As You Like It:	
	5.	11/110 10w Love 10,	
		iii) A Midsummer Night's Dream	

#### **Course Outcomes (Cos-4)**

1. The Student will be able critically appreciate a piece of dramatic art.

- 2. The Student will be fairly acquainted with the background and socio-political as well cultural background of the dramatist and understand the factors behind his making.
- 3. The student will grasp the distinctive dramatic style and technique of various playwrights.
- 4. He will understand the socio-political and cultural significance of Play and dramatic art.
- 5. He will be able to quote the memorable dialogue and quotations in his speech and

writing

#### **Recommended Reading/ Sources:**

- 1) Healy, Thomas : Christopher Marlowe (London, 1995)
- 2) Livin, Harry : Christopher Marlowe: The overereacher (London, 1964)
- : Marlowe: A Crtical Study (Cambridge, 1964) 3) Steane, J.B.
- 4) Schelling F.F : The Alchemist and Eastward Ho (Ed.)
- 5) Symonds J.A.
- 5) Symonds J.A. : Ben Jonson (1886)
  6) Swinburne A.C. : A Study of Ben Jonson (1889)
- 7) Bradley A.C. : Shakespearean Tragedy (2<sup>nd</sup> edition London, 1905)
- 8) Brooke, Stopford : On Ten Plays of Shakespeare (Kalyani Publishers, New Delhi 1988)
- 9) Campbell, Lily B : Shakespeare's Tragic Heroes: Slaves of Passion
- 10) Dowden, Edward : Shakespeare: His Mind and Art
- 11) Tillyard, E.M.W. : Shakespeare's Problem Plays (London: Chatto & W, 1951)

## **DISTRIBUTION OF MARKS WITH MARKING SCHEME -**

- There shall be *Five* Questions in the Question Paper and all the questions will be Compulsory.
- 1<sup>st</sup> Question will be of 'Reference to the Context'(Annotations) based on the Literary texts / Plays prescribed for study from Section B of the syllabus. There shall be *eight(08)* passages/stanzas/paras for explanations out of which four(04) have to be attempted each carrying 05 marks to test the examinees close reading and comprehension of the literary texts / plays. prescribed for study from Section B of the syllabus.
- 2nd question in the Question paper will have A and B sections. A Section comprises of Short Notes. Two (02) Short Notes will have to be attempted out of Five(05) each carrying 05 marks to test the students acquaintance with the dramatists and their works (Literary Texts / Plays) and general as well as conceptual understanding of the literary background. In the section B of the Question Paper, there shall be 05 Multiple Choice Objective-type Questions (MCQs) based on or related to the prescribed literary texts and literary background.
- 3<sup>rd</sup> Question will be a long answer question based on Section A- Unit -1 of the syllabus. The examinees shall have to attempt any One out of Two long answer questions of 15 marks each
- The 4th Question in the Question Paper will be a Long Answer Question (LAQ) based on Unit II with an Internal Choice carrying 15 marks each.
- The 5<sup>th</sup> Question in the Question Paper will be a Long Answer Question(LAQ) based on Unit III with an Internal Choice carrying 15 marks.

#### Abstract

1<sup>st</sup> Ouestion RTC 4 out of 8 (05 marks each) -Total 20 Marks 2<sup>nd</sup> Question A section comprising of 2 Short Notes out of 5 (05 marks each)- 10 Marks and B section with MCQs (01 mark each) -05 Marks -

	Total	15 Marks
3 <sup>rd</sup> LAQ based on Unit-1 with an internal choice carrying		15 Marks
LAQ based on Unit -2 with an internal Choice carrying		15 Mark
5 <sup>th</sup> LAQ based on Unit -3 with an internal Choice carrying		15 Marks

#### Total = 80 Marks

#### Distribution of Marks for Internal Assessment

Maximum Marks	Assignment	Seminar with PPT/Viva voce/Study Tour with Report presentation
20	10	10

#### Programme: M.A. English

#### Semester 1

Code of the	Title of the	Total Number of	Credits
Course/Subject	Course/Subject	Periods	
DSEENG105 Fiction (DSE)	Fiction (DSE)	60	04

#### Programme Specific Outcomes (PSOs- 5):

- 1) To enhance artistic sensibility for word and critical understanding of Novel as an art form.
- 2) To understand cultural and social importance of Novel as a genre from various chronological ages of English literature.
- 3) To acquire comprehensive understanding of plot construction and art of characterisation.
- 4) To enhance emotional depth and maturity as well as existential understanding of life.
- 5) To understand and assimilate the laws and principles of fiction writing.
- 6) To acquire insight and understanding of the mysteries and ironies of human life.

# UNITTopic / ContentPeriodsI1) Henry Fielding: Tom Jones<br/>2) Jane Austen: Sense and Sensibility20II2) Jane Austen: Sense and Sensibility20II1) Charles Dickens: David Copperfield<br/>2) Emily Bronte: Wuthering Heights20III1) Joseph Conrad: Heart of Darkness<br/>2) James Joyce: Ulysses20

#### Unit-Wise Syllabus –

#### **Course Outcomes (Cos -5)**

- 1. The Student will be able to critically appreciate and analyse a piece of fictional writing.
- 2. The Student will be fairly acquainted with the background and socio-political as well cultural background of the novelist and understand the factors behind his making.
- 3. The student will grasp the distinctive writing style and technique of various novelists.
- 4. S/he will understand the socio-political and cultural importance of Novel writing.
- 5. S/he will be able to quote the memorable quotations in his speech and writing and acquire artistic expression skill.
- 6. S/he acquire insight and understanding of the mysteries and ironies of human life.

#### **Recommended Reading:**

- 1) David Daichess Stevenson and the Art of Fiction (New York, 1951)
- 2) F.R. Leavis *The Great Tradition* (London, Penguin 1962)
- 3) Boris Ford ed. The Pelican Guide to English Literature, Vol. 6 & 7, Penguin books, 1970
- 4) Henry James, In Notes On Novelists, London, 1914
- 5) E. Shanks, A Study in Literature and Political Ideas (London, 1956)
- 6) J.W. Beach, Twentieth Century Novel, Lyall Book Depot, 1965

#### **Question Paper Pattern with Distribution of Marks & Marking Scheme :**

- There shall be *Four* Questions in the Question Paper and all the questions are Compulsory
- The first question will have A and B sections. A Section comprises of Short Notes. *Three* (03) Short Notes will have to be attempted out of Six each carrying 05 marks. In the section B, there shall be *five* (05) general *Multiple Choice Objective-type Questions* (MCQs) based on the syllabus each carrying one (01) mark.
- The Second Question in the Question Paper will be a Long Answer Question(LAQ) based on Unit I with an Internal Choice carrying 15 marks.
- The Third Question in the Question Paper will be a Long Answer Question(LAQ) based on Unit II with an Internal Choice carrying 15 marks.
- The Fourth Question in the Question Paper will be a Long Answer Question(LAQ) based on Unit III with an Internal Choice carrying 15 marks.

#### <u>Abstract</u>

1 <sup>st</sup> Question on A section having Short Notes 03 out of 06 (05 marks	each) – 15 Marks and
B section contains MCQs (01 mark each)	- 05 Marks
-	Total 20 Marks
2 <sup>nd</sup> LAQ based on Unit -1 with an internal Choice carrying	20 Marks
3rd LAQ based on Unit -2 with an internal Choice carrying	20 Marks
4 <sup>th</sup> LAQ based on Unit -3 with an internal Choice carrying	20 Marks

Total = 80 Marks

Distribution of Marks for Internal Assessment

Maximum Marks	Assignment	Seminar with PPT/Viva voce/Study Tour with Report presentation
20	10	10

# Part B

# Syllabus Prescribed under Choice based Credit System 2022-23 Faculty : Humanities Programme: M.A. (English) Part A

# Semester II

Code of the	Title of the	Total Number of	Credits
Course/Subject	Course/Subject	Periods	
DSCENG201 History of English Literature -2 (DSC)	History of English Literature -2 (DSC)	60	04

# Programme Specific Outcomes (PSOs- 6)

- 1) To develop a sense of history through understanding of major traditions, trends, conventions, fashions as well as social developments.
- 2) To facilitate insight into human nature as well as understanding of social norms and culture.
- 3) That the causes and consequences of human actions and dispositions.
- 4) To study the emergence and development of Renaissance and its influence on the English society.
- 5) To assimilate the values and principles that lead to progress and social well-being.

## Unit-Wise Syllabus -

UNIT	<b>TOPIC / CONTENT</b>	Periods
1.	Aspects related to The Puritan Age/ The Age of Milton; The Restoration Period / The Age of Dryden	20
2.	The Age of Pope; The Age of Dr. Johnson	20
3.	The Age of Transition; The Age of Wordsworth – The Romantic Revival	20

# Course Outcome (Cos- 6):

- 1) The student will attain a sense of history and the impulses behind human action.
- 2) To gain critical understanding and insight into trends & fashion in English society and culture.
- Understanding the factors behind the emergence of John Milton as well as other post-Shakesperean writers and value and significance of their literary output.
- 4) To critically analyse the chronology of events that led to the rise and growth of post Shakespearean writers.
- 5) To create good critical thinkers and writers.

# **Recommended Reading:**

- 1) Legouis and Cazamian: History of English Literature J.M. Dent & Sons Ltd. 1965
- 2) Crompton- Rickett, Arthur A History of English Literature
- 3) Hudson, W.H: An Outline History of English Literature
- 4) Sampson George: The Concise Cambridge History of English Literature

# **Question Paper Pattern with Distribution of Marks & Marking Scheme:**

- There shall be Four Questions in the Question Paper and all the questions are Compulsory
- The first question will have A and B sections. A Section comprises of Short Notes. Three Short Notes will have to be attempted out of Six each carrying 05 marks. In the section B, there shall be *five* (05) general *Multiple Choice Objective-type Questions* (MCQs) each carrying one (01) mark.
- The Second Question in the Question Paper will be a Long Answer Question(LAQ) based on Unit I with an Internal Choice carrying 20 marks.
- The Third Question in the Question Paper will be a Long Answer Question(LAQ) based on Unit II with an Internal Choice carrying 20 marks.
- The Fourth Question in the Question Paper will be a Long Answer Question(LAQ) based on Unit III with an Internal Choice carrying 20 marks.

Abstract	rka anab) 15 Marka and
1 Question on A section having short Notes 05 out of 06 (05 mai	rks each) = 13 what is and
B section contains MCQs (01 mark each)	- 05 Marks
-	Total 20 Marks
2 <sup>nd</sup> LAQ based on Unit -1 with an internal Choice carrying	20 Marks
3rd LAQ based on Unit -2 with an internal Choice carrying	20 Marks
4 <sup>th</sup> LAQ based on Unit -3 with an internal Choice carrying	20 Marks

#### Total = 80 Marks

Distribution of Marks for Internal Assessment

Maximum Marks	Assignment	Seminar with PPT/Viva	
		voce/Study Tour with	
		<b>Report presentation</b>	
20	10	10	

## Programme: M.A. English

#### Semester II

Code of the	Title of the	Total Number of	Credits
Course/Subject	Course/Subject	Periods	
DSCENG202 Literary Criticism- 2 (DSC)	Literary Criticism- 2 (DSC)	60	04

## Programme Specific Outcomes (PSOs- 7)

- 1) To enhance aesthetic understanding and expression skills.
- 2) To develop critical, analytical and logical thinking and judgment.
- 3) To grasp and assimilate critical temper and insight.
- 4) To appreciate and analyse critical texts and documents.
- 5) To apply logic, reasoning and sense of discrimination in decision-making.
- 6) To grow in erudition and intellectual scholarship.

## Unit-Wise Syllabus -

		Periods
UNII	IOPIC / CONTENI	
1.	a) William Wordsworth – 'Preface to Lyrical Ballads'	
		20
	b) S.T. Coleridge – 'Biographia Literaria' – (Chapters 13, 14, 17 and 18)	
2.	a) Matthew Arnold- Function of Criticism at Present Time	
		20
	b) T.S. Eliot – 'Tradition and Individual Talent'; 'The Metaphysical Poets'	
3.	a) I.A. Richards - Four Kinds of Meaning	
		20
	b) Northrope Frye – The Archetypes of Literature	

# Course Outcome (Cos - 7):

- 1) The student be able to write critical and scholarly reviews and articles.
- 2) The student analyse and interpret texts and grasp subtle and deep meaning embedded in the texts.
- 3) The student compare and contrast different ideas logically and rationally.
- 4) The student apply critical sense and judgment to form an informed opinion.
- 5) The student will acquire critical attitude and approach.
- 6) The student will acquire knowledge, intellectual competence and critical scholarship.

# **Recommended Reading:**

David Lodge: Modern Criticism and Theory (Longman:2008) with ISBN- 978-0582784543 0r ISBN-10:0582784549

Lodge, David and Nigel Wood eds. 1998. Modern Criticism and Theory: A Reader. Essex: Pearson Education Limited

Raman Selden: The Theory of Criticism: From Plato to the Present (Reader) Paperback: 1988 David Lodge: Twentieth Century Literary Criticism: A Reader (Paperback – 1972)

# Question Paper Pattern with Distribution of Marks & Marking Scheme:

- There shall be Four Questions in the Question Paper and all the questions are Compulsory
- The first question will have A and B sections. A Section comprises of Short Notes. Three Short Notes will have to be attempted out of Six each carrying 05 marks. In the section B, there shall be *five* (05) general *Multiple Choice Objective-type Questions* (MCQs) each carrying one (01) mark.
- The Second Question in the Question Paper will be a Long Answer Question(LAQ) based on Unit I with an Internal Choice carrying 20 marks.
- The Third Question in the Question Paper will be a Long Answer Question(LAQ) based on Unit II with an Internal Choice carrying 20 marks.
- The Fourth Question in the Question Paper will be a Long Answer Question(LAQ) based on Unit III with an Internal Choice carrying 20 marks.

# <u>Abstract</u>

1<sup>st</sup> Question on A section having Short Notes 03 out of 06 (05 marks each) – 15 Marks and B section contains MCQs (01 mark each) - 05 Marks

-	Total 20 Marks
2 <sup>nd</sup> LAQ based on Unit -1 with an internal Choice carrying	20 Marks
3rd LAQ based on Unit -2 with an internal Choice carrying	20 Marks
4 <sup>th</sup> LAQ based on Unit -3 with an internal Choice carrying	20 Marks

# Total = 80 Marks

Distribution of Marks for Internal Assessment

Maximum Marks	Assignment	Seminar with PPT/Viva	
		voce/Study Tour with	
		<b>Report presentation</b>	
20	10	10	

#### Programme: M.A. English

#### Semester II

Code of the Course/Subject	Title of the Course/Subject	Total Number of Periods	Credits
DSCENG203 Poetry – 2 (DSE)	Poetry – 2 (DSE)	60	04

#### Programme Specific Outcomes (PSOs- 8)

- 1) To enhance artistic sensibility for sounds or word-music and critical appreciation of Poetry as an Art.
- 2) To develop fertile imaginativeness and emotional depth and maturity.
- 3) To perceive subtle nuances and shades of meaning in the use of language.
- 4) To appreciate and assimilate subtle, suggestive and pictorial quality of language.
- 5) To sharpen artistic and critical skills with better grasp and acquisition of qualities like picturesqueness, terseness, conciseness, accuracy, aptness, freshness *etc.* in expression.
- 6) To acquire the ability to read between the lines.
- 7) To appreciate and acquire the evocative power of language.
- 8) To explore the subjective nature of Truth and Beauty.

# Unit-Wise Syllabus -

		Periods
UNIT	TOPIC / CONTENT	
	i) William Wordsworth: a) The Prelude – <b>Book I</b> ; b) Daffodils; c) The	
1.	Solitary Reaper; d) The World is too Much with us	20
	1) P.B. Shelley: a) Io The Skylark; b) Ode to the West wind;	
	e) Ozymandias:	
	iii) John Keats: a) Ode to a Nightingale; b) Ode on a Grecian Urn; c)	
	When I have fears; d) Bright Star! Would I were as Steadfast as Thou Art	
	i) Robert Browning: a) Andrea Del Sarto: h) The Last Ride Together: c)	
	The Grammarian's Funeral d) My Last Duchess: e) Love in a Life	20
2.		
	ii) Lord Tennyson: a) In Memoriam A.H.H. (Prologue; Cantos I-V and	
	Epilogue); b) The Lady of Shallot; c) Ulysses; d)Crossing the Bar	
	iii) Matthew Arnold: a) Shakasnaara: b) Mamorial Varsas: c) The Scholar	
	Gypsy: d) Dover Beach	
	i) T.S.Eliot: <i>The Wasteland</i>	
		20
3.	ii) W.B. Yeats: a) Easter 1916; b) The Second Coming; c) Sailing to	
	Byzantium; d) When You are Old; e) An Irish Young Airman Foresees his	
	Deum	
	iii) W.H. Auden: a) Stop All the Clocks; b)In Memory of W.B.Yeats;	
	c)Lullaby; d)September 1, 1939	

#### **Course Outcomes (Cos- 8)**

- 1. The Student will be able to critically appreciate and interpret a piece of poetic work.
- 2. The Student will be fairly acquainted with the background and socio-political as well
- cultural background of the poet and understand the factors behind his making and evolution.
- 3. The student will grasp the distinctive poetic style and technique of various poets.
- 4. The student will understand the socio-political and cultural importance of Poetry and Poetic art.

- 5. The student will be able to quote the memorable quotations in his speech and writing.
- 6. The student will be able to understand and apply the evocative power of language.
- 7. The student will understand and appreciate the subjective nature of Truth and Beauty.
- 8. The student will acquire enhanced sensibility and emotional depth and maturity in his/her expression.

#### **Recommended Reading/ Sources:**

- 1) *English Poetry From Elizabethans to the Restoration; An Anthology*, Edited by Pramod K. Nayar, Orient Blackswan Publication
- 2) The Making of a Poem by Earon Boland
- 3) The Force of Poetry by Christopher Rick; Clarendon Press
- 4) Theory of Lyric by Jonathan Culler Harvard University Press
- 5) This is Shakespeare: How to Read the world's Greatest Playwright by Emma Smith; Pelican publishers,
- 6) <u>www.ListMuse.com</u>
- 7) <u>https://interestingliterature.com</u>
- 8) https:/www.poetryfoundation.org

#### **Distribution of Marks and Marking Scheme:**

- There shall be Four Questions in the Question Paper and all the questions are Compulsory
- 1st Question will be of 'Reference to Context' on the Texts prescribed. There shall be 08 stanzas for explanation out of which Four have to be attempted each carrying 05 marks.
- 2<sup>nd</sup> question in the question paper will have A and B sections. A Section comprises of Short Notes. Two Short Notes will have to be attempted out of Four each carrying 04 marks to test the students acquaintance with the poets and their works and general as well as conceptual understanding of their background and their intellectual positions. In the section B, There shall be 07 general *Multiple Choice Objective-type Questions* (MCQs) based on the poets and their background.
- The Third Question in the Question Paper will be a Long Answer Question(LAQ) based on Unit I with an Internal Choice carrying 15 marks.
- The Fourth Question in the Question Paper will be a Long Answer Question(LAQ) based on Unit II with an Internal Choice carrying 15 marks.
- The Fourth Question in the Question Paper will be a Long Answer Question(LAQ) based on Unit III with an Internal Choice carrying 15 marks.

#### <u>Abstract</u>

1 <sup>st</sup> Question RTC 4 out of 8 (05 marks each) -	Total 20 Marks
$2^{nd}$ Question A section Short Notes 02 out of 04 (04 marks each) –	08 Marks and
B section MCQs (01 mark each) -	07 Marks
	Total 15 Marks
3 <sup>rd</sup> LAQ based on Unit -1 with an internal Choice carrying	15 Marks
4 <sup>th</sup> LAQ based on Unit -2 with an internal Choice carrying	15 Marks
5 <sup>th</sup> LAQ based on Unit -3 with an internal Choice carrying	15 Marks

#### Total = 80 Marks

Distribution of Marks for Internal Assessment

Maximum	Assignment	Seminar with PPT/Viva voce/Study
Marks		Tour with Report presentation
20	10	10

## Programme: M.A. English

#### Semester II

Code of the	Title of	the Total Numb	er of Credits
Course/Subject	Course/St	bject Periods	
DSEENG204 Dram	a – 2 Drama-2 (	(DSE) 60	04

# **Programme Specific Outcomes (PSOs - 9):**

- 1) To enhance artistic sensibility for word-music and critical appreciation of Dramatic art.
- 2) To understand various dramatic types and the origin of the English drama.
- 3) To explore and appreciate the wonder and magic of Renaissance Drama and the greatness of Shakespearean dramatic art.
- 4) To understand and assimilate the laws and principles of dramatic composition.
- 5) To acquire insight and understanding of the mysteries and ironies of human life.

## **UNIT-WISE SYLLABUS -**

Section	UNIT	TOPIC / CONTENT	
Section A (Literary Background) Text Prescribed: A <i>Background to the study of English Literature</i> (Revised Edition) by B. Prasad			
		Chapter III – Dramatic Devices	
A.	1.	Chapter V- Origin of the English Theatre	
		Chapter V - Notes on Shakespeare:-	
		Shakespeare's English Historical Plays;	
		Shakespeare's Roman Plays Tragedy	
		Chapter VII: Dramatic Modernism	
Section B (Literary Texts / Plays)			
		i) Oscar Wilde: The Importance of Being Ernest	
B.	2.	ii) T.S. Eliot: The Cocktail Party	
		iii) George Bernard Shaw: Arms and the Man	
		i) Henrik Ibsen: A Doll's House	
	3.	ii) Samuel Beckett: Waiting for Godot	
		iii) Harold Pinter: The Birthday Party	

#### **Course Outcomes (Cos - 9)**

- 1. The Student will be able critically appreciate a piece of dramatic art.
- 2. The Student will be fairly acquainted with the background and socio-political as well cultural background of the dramatist and understand the factors behind his making.
- 3. The student will grasp the distinctive dramatic style and technique of various playwrights.
- 4. He will understand the socio-political and cultural significance of Play and dramatic art.
- 5. He will be able to quote the memorable dialogue and quotations in his speech and writing.

# **Employment Potential:**

- 1. In Print Media and Publishing houses
- 2. In NGOs and Social Service and Social work
- 3. In advertisement company and film industry

# **Recommended Reading-**

- 1) E.R. Bentley *Playwright As a Thinker* (New York, 1946)
- 2) P. Braybrooke Oscar Wilde A Study (London, 1936)
- 3) A. Henderson George Bernard Shaw: Playboy and Prophet (New York, 1932)
- 4) G.K. Chesterton George Bernard Shaw (Rev. Ed. London, 1935)
- 5) A.C. Ward Bernard Shaw (London, 1951)
- 6) George Williamson T.S. Eliot's Poetry and Plays: A Study in Sources and Meaning (Rev. ed. Chicago, 1960)
- 7) Helen Gardner The Art of T.S. Eliot
- 8) Maurice Bourgeois Synge and the Irish Theatre (London, 1913)
- 9) Isabella Gregory *Our Irish Theatre* (London, 1914)
- 10) Reynolds, D Modern English Drama (London, 1949)
- 11) Williams, P Drama from Ibsen to Eliot (London, 1952)
- 12) Lumley. F Trends in the Twentieth Century Drama (London. 1956)
- 13) R. Hayman John Osborne IInd Edition, 1969
- 14) R.Cohn Just Play: Beckett's Theatre, 1980

## DISTRIBUTION OF MARKS AND MARKING SCHEME -

- 1. Text prescribed for *Section A (Literary Background)* : A *Background to the study of English Literature* (Revised Edition) by B. Prasad and Haripriya Ramadoss (New Delhi Laxmi Publications, 2016)
- 2. There shall be *Five* Questions in the Question Paper and all the questions will be Compulsory.
- 3. 1<sup>st</sup> Question will be of 'Reference to the Context'(*Annotations*) based on the Literary texts / Plays prescribed for study from Section B of the syllabus. There shall be *eight(08)* passages/stanzas/paras for explanations out of which *four(04)* have to be attempted each carrying 05 marks to test the examinees close reading and comprehension of the literary texts / plays. prescribed for study from Section B of the syllabus.
- 4. 2nd question in the Question paper will have A and B sections. A Section comprises of Short Notes. *Two (02)* Short Notes will have to be attempted out of *Five(05)* each carrying 05 marks to test the students acquaintance with the dramatists and their works (Literary Texts / Plays) and general as well as conceptual understanding of the literary background. In the section B of the Question Paper, there shall be 05 *Multiple Choice Objective-type Questions* (MCQs) based on or related to the prescribed literary texts and literary background.
- 3<sup>rd</sup> Question will be a long answer question based on Section A- Unit -1 of the syllabus. The examinees shall have to attempt any One out of Two long answer questions of 15 marks each
- 6. The 4th Question in the Question Paper will be a Long Answer Question (LAQ) based on Unit II with an Internal Choice carrying *15 marks each*.
- 7. The 5<sup>th</sup> Question in the Question Paper will be a Long Answer Question(LAQ) based on Unit III with an Internal Choice carrying *15 marks*.

# <u>Abstrac</u>t

1<sup>st</sup> Question RTC 4 out of 8 (05 marks each) - *Total 20 Marks* 2<sup>nd</sup> Question A section comprising of 2 Short Notes out of 5 (05 marks each) - *10 Marks* and B section with MCQs (01 mark each) - 05 Marks –

Total 15 Marks

3<sup>rd</sup> LAQ based on Unit-1 with an internal choice carrying *15 Marks* 

4<sup>th</sup> LAQ based on Unit -2 with an internal Choice carrying *15 Mark* 

5<sup>th</sup> LAQ based on Unit -3 with an internal Choice carrying 15 Marks

Total = 80 Marks

Distribution of Marks for Internal Assessment

Maximum Marks	Assignment	Seminar with PPT/Viva voce/Study Tour with Report presentation	
20	10	10	

#### Programme: M.A. English

#### Semester II

Code of the Course/Subject	Title of the Course/Subject	Total Number of Periods	Credits
DSEENG205	Non-Fiction (DSE)	60	04
<b>Non-Fiction</b>			

#### Programme Specific Outcomes (PSOs - 10)

- 1) To educate students in English with a view to enable them to probe literary & critical theories & contexts that require substantive expertise in literature.
- 2) To foster ideological sense and a sense of social awareness and social understanding.
- 3) To acquire proficiency in expression skills and, critical thinking through various forms of writing with a view to contribute to social debates and public discourse.
- 4) To develop research, critical and analytical attitude & approach in the students.
- 5) To help emerge social thinkers & critics who can take up various social problems and issues that ail the society and impede social change and progress and thus to achieve social transformation and social progress.
- 6) To help grow great leaders, thinkers, visionaries, pundits, experts, educators, managers, consultants, guides, coaches, social analysts, reformers, social activists, crusaders, pleaders, journalists, critical and creative writers professionally in various fields of knowledge.

#### Unit-Wise Syllabus-

UNIT	TOPIC / CONTENT	Periods
1.	<ul> <li>a) Jean-Paul Satre: What is Literature?</li> <li>b) Viktor Frankl - Man's Search for Meaning</li> <li>b) V.S. Naipaul: India: A Million Mutinies Now</li> </ul>	20
2.	<ul> <li>a) Rousseau: <i>The Social Contract</i></li> <li>b) J.S. Mill: <i>On Liberty</i></li> <li>c) B.R. Ambedkar: <i>Annihilation of Caste (Rev. Ed)</i></li> </ul>	20
3.	<ul> <li>a) Amartya Sen : An Argumentative Indian</li> <li>b) Amitav Ghosh: 'The Great Derangement: Climate Change and the Unthinkable'</li> <li>c) Simone de Beauvoir: The Ethics of Ambiguity</li> </ul>	20

#### Course Outcomes (Cos - 10):

- 1) The student will be able to write sociological and critical reviews.
- 2) The student will be to analyse and interpret social problems and undertake social projects.
- 3) The student will be to compare and contrast different ideas in pubic and social discourse.
- 4) The student will be to apply critical sense and judgment to form an informed opinion.
- 5) The student will be to acquire critical understanding and social and environmental awareness.
- 6) The subject will help grow great leaders, thinkers, visionaries, pundits, experts, educators, managers, consultants, guides, coaches, social analysts, reformers, social activists, crusaders, pleaders, journalists, critical and creative writers professionally in various fields of knowledge.

## **Recommended Reading:**

- 1) Satre, Jean-Paul: Literature & Existential, Philosophical Library/ Open Road, 2012
- 2) Satre, Jean-Paul : *The Philosophy of Existential*: *Selected Essays*, Philosophical Library/ Open Road, 2012
- 3) Satre, Jean-Paul: *Notebooks for an Ethics*, Trans. By David Pellauer, University of Chicago Press Ltd., London, 1992
- 4) Rousseau, Jean-Jacques: A Discourse on Inequality, Penguin Publications, reprint 1984
- 5) Rousseau, Jean-Jacques: *Discourse on the Arts and Sciences* London, published by W. Owen, 1751
- 6) Beauvoir, Simone (1971). The Second Sex. Alfred A. Knopf
- 7) Ambedkar, B.R Who Were The Shudras? Maven Books, rev. edition, 2021
- 8) Ambedkar, B.R *Riddles in Hinduism* (first published Jan. 1954), Navayana Publishing, rev. ed, 2016
- **9**) Roy, Arundhati, *The Doctor and the Saint: The Ambedkar-Gandhi Debate*, Haymarket Books, 2017

# **Employment Potential:**

- 1) In Print Media and Publishing houses
- 2) In NGOs and Social Service and Social work
- 3) In Socio-Political Organisations and administrative fields.

## **Question Paper Pattern with Distribution of Marks & Marking Scheme:**

- There shall be *Four* Questions in the Question Paper and all the questions are Compulsory
- The first question will have A and B sections. A Section comprises of Short Notes. Three Short Notes will have to be attempted out of Six each carrying 05 marks. In the section B, there shall be *five* (05) general *Multiple Choice Objective-type Questions* (MCQs) each carrying one (01) mark.
- The Second Question in the Question Paper will be a Long Answer Question(LAQ) based on Unit I with an Internal Choice carrying 20 marks.
- The Third Question in the Question Paper will be a Long Answer Question(LAQ) based on Unit II with an Internal Choice carrying 20 marks.
- The Fourth Question in the Question Paper will be a Long Answer Question(LAQ) based on Unit III with an Internal Choice carrying 20 marks.

#### **Abstract**

 $1^{st}$  Question on A section having Short Notes 03 out of 06 (05 marks each) – 15 Marks and B section contains MCQs (01 mark each) - 05 Marks

Total 20 Marks

2<sup>nd</sup> LAQ based on Unit -1 with an internal Choice carrying *20 Marks* 3rd LAQ based on Unit -2 with an internal Choice carrying *20 Marks* 4<sup>th</sup> LAQ based on Unit -3 with an internal Choice carrying *20 Marks* 

Total - 80 Marks

#### **Distribution of Marks for Internal Assessment**

Maximum Marks	Assignment	Seminar with PPT/Viva
		voce/Study Tour with Report presentation
20	10	10

## Programme: M.A. English

#### Semester II

Code of the	Title of the	Total Number of	Credits
Course/Subject	Course/Subject	Periods	
GICENG206 Practical Criticism	Practical Criticism (OEC-GIC)	30	02

## Programme Specific Outcomes (PSOs- 11)

- 1) To develop critical, analytical and logical thinking and judgment.
- 2) To grasp and assimilate critical temper and insight.
- 3) To appreciate and analyse critical texts and documents.
- 4) To apply logic, reasoning and sense of discrimination in decision-making.
- 5) To grow in erudition and intellectual scholarship

#### Unit-Wise Syllabus -

UNIT	TOPIC	PERIODS
1.	Aspects of Criticism- Nature, Scope & Importance; Functions, Principles, Types etc	10
2.	Critical Appreciation/Review of Prose	10
3.	Critical Appreciation/ Review of Poetry	10

#### **Course Outcome (COs - 11)**

- 1) Student will acquire skill to write critical and scholarly reviews and articles.
- 2) Student will acquire skill to analyse and interpret texts and grasp subtle and deep meaning embedded in the texts.
- 3) Student will acquire skill to compare and contrast different ideas logically and rationally.
- 4) Student will acquire skill to apply critical sense and judgment to form an informed opinion.
- 5) Students will gain skill and competence to perform better in debates, intellectual arguments and Group Discussions and competitive exams.

# **Employment Potential:**

- 1) In Print Media and Publishing houses
- 2) In NGOs and Social Service and Social work
- 3) In Socio-Political Organisations and administrative fields.
- 4) In the writing and publishing field as well as in Print & Social Media, Advertising, Film & Entertainment Industry (if suitably supplemented with other specialisation and knowledge).

## **Recommended Reading:**

- 1) David Lodge: *Modern Criticism and Theory* (Longman:2008) with ISBN- 978-0582784543 0r ISBN-10:0582784549
- 2) Lodge, David and Nigel Wood eds. 1998. *Modern Criticism and Theory: A Reader*. Essex: Pearson Education Limited
- 3) Raman Selden: *The Theory of Criticism: From Plato to the Present (Reader)* Paperback: 1988k
- 4) David Lodge: Twentieth Century Literary Criticism: A Reader (Paperback 1972)
- 5) Richards, I.A Practical Criticism Harper Perennial Publishers, 1956
- 6) Richards, Ivor How to Read a Page: A Course in Efficient Reading Beacon Press, 2000

# **Question Paper Pattern with Distribution of Marks & Marking Scheme:**

- There shall be *Three* Questions in the Question Paper and all the questions are Compulsory
- The first question will have A and B sections. A Section comprises of Short Notes. Two Short Notes will have to be attempted out of Five each carrying 05 marks based on the understanding of various critical terminologies , methods and practices under Unit I.
- The Second Question of Critical in the Question Paper will be a Long Answer Question(LAQ) based on Unit II review / appreciation of passage or paragraph of prose with an Internal choice carrying 10 marks.
- The Second Question of Critical in the Question Paper will be a Long Answer Question(LAQ) based on Unit III review / appreciation of a poem or piece of poetic lines with an Internal choice carrying 10 marks.

Total Marks: 30

# <u>Abstract</u>

1<sup>st</sup> Question on A section having Short Notes 02 out of 05 (05 marks each) – 10 Marks
2<sup>nd</sup> LAQ based on Unit -II with an internal Choice carrying 10 Marks
3rd LAQ based on Unit -III with an internal Choice carrying 10 Marks

Total Marks: 30

#### Distribution of Marks for Internal Assessment -

Maximum Marks	Assignment	Presentation /Group Discussion with Viva voce
20	10	10
### **APPENDIX - A**

## Master of Arts (M.A.) Full Time Two Years Degree Programme:-

- **1)** A Student shall have to be admitted every year in the respective Institute/ College/University Department for completion of an academic year of this twoyear degree programme.
- 2) The M.A. degree shall consist of four semesters i.e. Semester I & II in the first academic year, Semester III & IV in the second Academic Year.
- **3)** Student has to complete all four Semesters for the award of degree of Master of Arts and should fulfill conditions as per ordinance no. 19.
- **4)** Every Semester of M.A. programme shall be of at least 90 teaching days in a semester and shall be of at least 180 teaching days in an academic year.
- 5) The Semester wise structure of the programme is as follows.

## Sant Gadge Baba Amravati University Amravati

# Scheme of teaching, learning & Examination leading to the Degree Master of Arts (M. A.) (Two Years ... Four Semesters Degree Programme- C.B.C.S)

(M. A. Part-I) Semester- I

			Teaching & Learning Scheme						Duration of Exams Hrs.	Examination & Evaluation Scheme												
							Те	achin	g Perio	od Per		Credits				Max		mum Marks			Minimum Passing	
Sr. No	Subjects	Subject Code		week				Practical	Total		Theory	Theory	Practical		Total Marks	Marks	Grade					
			L	Т	Р	Total	rial				+ M.C.Q External	Internal	Inter nal	Exte rnal	-							
1	DSC - 1		3	-	-	3	3	_`	3	3	80	20	-	-	100	40	р					
2	AEC-1 for DSC- 1		-	1	-	1	1	-	1	1	-	-	2 5	-	25	10	Р					
3	DSC – 2		4	-	-	4	4	_`	4	3	80	20	-	-	100	40	р					
4	DSC – 3 (OR)		4	-	-	4	4	_`	4	3	80	20	-	-	100	40	р					
	DSE (OR)		4	-	-	4	4	_`	4	3	80	20	-	-	100	40	р					
	DSC – 3 for Geog & Music		-	-	4	4	-	4	4	3	-	-	80	20	100	50	р					
5	DSC – 4 (OR)		4	-	-	4	4	-`	4	3	80	20	-	-	100	40	Р					
	DSC – 4 for Geog, Music , Psychology Yogashastra (OR)				4	4	-	4	4	3	-	-	80	20	100	50	р					
	DSC – 4 for Home Economics (OR)		4	-	-	4	3	-	3	3	80	-	-	-	80	32	Р					
			-	-	1	1		1	1	3	-	-	10	10	20	08	Р					
6	DSE		4	-	-	4	4	_`	4	3	80	20	-	-	100	40	р					
7	DSE – 5 for Geog & Psychology		4	-	-	4	4	-`	4	3	80	20	-	-	100	40	р					

L: Lecture, T: Tutorial, P: Practical

Note: Internship /Field Work / Work Experience will be conducted after I semester till IV semester in vacations for minimum 60 hrs. to maximum 90 hours. It's credits and grades will be reflected in final semester IV credit grade report.

- OEC (Optional) can be studied during semester I to IV, Its credits and grades will be reflected in final semester IV credit grade report

APPENDIX – A2.

# Sant Gadge Baba Amravati University Amravati Scheme of teaching, learning & Examination leading to the Degree Master of Arts (M. A.) (Two Years ... Four Semesters Degree Programme- C.B.C.S)

								Sem	ester- II									
	Subjects			Teaching & Learning Scheme							Examination & Evaluation Scheme							
			Teaching Period Per		Credits				Maximum Marks M					Minimum	Minimum Passing			
Sr. No		Subject Code		Week				Practical	Total		Theory	Theory	Practical		Total Marks	Marks	Grade	
			L	Т	Р	Total	rial				+ M.C.Q External	Internal	Inter nal	Exte rnal				
1	DSC - 1		3	-	-	3	3	-`	3	3	80	20	-	-	100	40	р	
2	AEC for DSC-1			1		1	1	-	1	1	-	-	2 5	-	25	10	Р	
3	DSC – 2		4	-	-	4	4	-`	4	3	80	20	-	-	100	40	р	
4	DSC – 3 (OR)		4	-	-	4	4	-`	4	3	80	20	-	-	100	40	р	
	DSE (OR)		4	-	-	4	4	_`	4	3	80	20	-	-	100	40	р	
	DSC – 3 for Geog & Music		-	-	4	4	-	4	4	3	-	-	80	20	100	50	р	
5	DSC – 4 (OR)		4	-	-	4	4	-`	4	3	80	20	-	-	100	40	Р	
	DSC – 4 for Geog, Music , Psychology Yogashastra (OR)				4	4	-	4	4	3	-	-	80	20	100	50	р	
	DSC – 4 for Home Economics (OR)		4	-	-	4	3	-	3	3	80	-	-	-	80	32	Р	
			-	-	1	1		1	1	3	-	-	10	10	20	08	Р	
6	DSE		4	-	-	4	4	-`	4	3	80	20	-	-	100	40	р	
7	DSE – 5 for Geog & Psychology		4	-	-	4	4	-`	4	3	80	20	-	-	100	40	р	

# ree Master of Arts ( M. (M. A. Part-I)

Sant Gadge Baba Amravati University Amravati
Scheme of teaching, learning & Examination leading to the Degree Master of Commerce (Two Years Four Semesters Degree Course- C.B.C.S)
(M Com Part I) Somostar I

									(t-1) Semester	-1							
Sr.				Teaching & Learning Scheme						Duratio n of Exams Hrs.	Examination & Evaluation Scheme						
	Subjects	Subject Code	Teac	Teaching Period Per			Credits				Maximum Marks					Minimum Passing	
110							Theory	Practical	Total		Theory + M.C.Q	Internal Assessment of	Practical		Total Marks	Marks	Grade
			L	Т	Р	Total					External	course outcomes	Inter nal	Exte rnal			
1	Managerial Economics (DSC)	MCOM-11	5	-	-	5	5	-	5	3	60+20	20	-	-	100	40	р
2	Service Marketing and Customer Relationship Management (DSC)	MCOM-12	5	-	-	5	5	-	5	3	60+20	20	-	-	100	40	р
3	Advance Financial and Cost Accounting (DSC)	MCOM-13	5	-	-	5	5	-	5	3	60+20	20	-	-	100	40	р
4	Banking and Insurance Services (DSC)	MCOM-14	4	-	-	4	4	-	4	3	60+20	20	-	-	100	40	р
5	AEC to DSC IV	MCOM-14	-	-	1	1	-	1	1	-	-	-	25	25	50	20	р
	Total					20			20						450		

L: Lecture, T: Tutorial, P: Practical

# Sant Gadge Baba Amravati University Amravati

# Scheme of teaching, learning & Examination leading to the Degree Master of Commerce (Two Years ... four Semesters Degree Course- C.B.C.S)

(M. Com Part-I)

# Semester- II

			Teaching & Learning Scheme								Examination & Evaluation Scheme							
			Teaching Period Per week			veek		Credit	5		Max	ximum Marks				Minimum	Minimum Passing	
Sr. No	Subjects	Subject Code					Theory	Practical	Total		Theory + M.C.Q	Internal Assessment of	Practical		Total Marks	Marks	Grade	
			L	Т	Р	Total					External	Course Outcomes	Intern al	Extern al				
1	Accounting for Managerial decision (DSC)	MCOM- 21	4	-	-	4	4	-	4	3	60+20	20	-	-	100	40	р	
2	AEC to DSC I	MCOM- 21	-	-	1	1	-	1	1	-	-		25	25	50	20	Р	
3	Strategic Management (DSC)	MCOM- 22	5	-	-	5	5	-	5	3	60+20	20	-	-	100	40	Р	
4	Management Concept and organizational Behavior (DSC)	MCOM- 23	5	-	-	5	5	-	5	3	60+20	20	-	-	100	40	Р	
5	Computer Application in Business (SEC)	MCOM- 24	3	-	-	3	3	-	3	3	40+20	-	-	-	60	24	Р	
6	Computer Application in Business (SEC) (Practical)	MCOM- 24	-	-	2	2	-	2	2	-	-	-	40		40	16	Р	
	Total					20			20						450			

L: Lecture, T: Tutorial, P: Practical

## Sant Gadge Baba Amravati University, Amravati

### **Faculty of Science and Technology**

## **Programme: M Sc Computer Science**

#### PROGRAMME OUTCOMES (POs)

Upon completion of the programme successfully, students would be able to

#### **PO1: Problem Analysis**

Identify, formulate, review research literature and analyze complex engineering problems in Computer Science and Engineering reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

#### PO2: Design / Development of Solutions

Design solutions for complex engineering problems and design system components or processes of Computer Science and Engineering that meet the specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.

#### **PO3:** Conduct Investigations of Complex Problems

Use research-based knowledge and research methods including design of experiments in Computer Science and Engineering, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

#### PO4: Modern tool usage

Create, select and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex activities related to Computer Science with an understanding of the limitations.

#### PO5: The services to the society

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice in Computer Science and Engineering.

#### **PO6: Project Management**

Demonstrate knowledge and understanding of the computer science and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

#### PROGRAMME SPECIFIC OUTCOMES (PSOs)

Upon completion of the programme successfully, students would be able to

**PSO 1:** deliver efficient solutions for emerging challenges in the computation domain through continuous learning

#### PSO2

design, develop, implement computer programs and use knowledge in various domains to identify research gaps and hence to provide solution to new ideas and innovations.

#### **Employability Potential in M.Sc. Computer Science**

If you've studied computer science, you will have gained many technical and non-technical skills which are highly valued by employers, from leadership to programming. The increasing scope of

computer science means you have plenty of choice in a wide variety of highly specialized areas.

Computer technologies are integral to modern life, so you're likely to find your computer science skills in high demand across many different industries. These include financial organizations, management consultancy firms, software houses, communications companies, data warehouses, multinational companies, governmental agencies, universities and hospitals.

As always, it's extremely beneficial to have completed relevant work experience. You should also consider compiling a portfolio of your own independent projects outside of your degree, which could be in the form of programming, moderating online or even building an app. This will demonstrate to employers your interest in the subject and your problem-solving skills, creativity and initiative.

- Application analyst.
- Applications developer.
- Cyber security analyst.
- Data analyst.
- Forensic computer analyst.
- Game designer.
- Games developer.
- Machine learning engineer
- Cyber security analyst
  - Data analyst
  - Forensic computer analyst
  - Game designer
  - Games developer
  - Machine learning engineer
  - Penetration tester
  - Software engineer
  - Systems analyst
  - UX designer
  - Web designer & Developer
  - Business analyst
  - IT sales professional
  - IT trainer
  - Nanotechnologist
  - Network Engineer
  - Telecommunications researcher
  - Database Manager/ Administrator

Common employers are IT consultancies and IT service providers. However, as most businesses rely on computers to function effectively, there are also opportunities within the IT departments of major organisations in sectors such as:

- Aerospace and Defence
- Agricultural
- Financial Services
- Healthcare
- Manufacturing
- Public And Third Sectors
- Telecommunications

- Banking
- E-Commerce
- Medical
- Defence
- Education
- Communication
- Automobile Industry
- Printing Industry
- Film Industry
- Entertainment Industry
- E- Governance
- Satellite Launching
- Simulators
- Research & Development
- And Lot More...

You can also find opportunities with a range of small to medium-sized enterprises (SMEs).

Another option is to set up your own business, providing IT services such as web design and consultancy.

Computing degrees combine theoretical study and practical projects, teaching you subject-specific skills including:

- Programming Languages
- Hardware Architecture And Construction
- Network Design and Engineering
- Software Engineering
- Multimedia Design
- Software Tools and Packages.

You'll learn how to specify, design and construct computer-based systems, evaluate and recognise potential risks and design creative solutions.

You'll also get more generic skills from your computing degree including:

- Teamwork and Leadership
- Communication
- Problem Solving
- Negotiation
- Time Management and Organisation
- Report Writing
- Numeracy
- Commercial Awareness.

Continuing professional development (CPD) is especially important when you're working with computers as technology and software develops at such a rapid pace.

# Prescribed Syllabus Semester-I Core Subjects

Course	Code	1MCS1							
Course	e Name	1 Computer System Design							
Total (	Credits	4							
Course	Outcomes	Course Outcome:							
		Upon completion of this course successfully, students would be able to							
		1. Understand the theory and architecture of central processing unit							
		2. Analyze some of the design issues in terms of speed, technolog	gy, cost,						
		performance.							
		3. Design a simple CPU with applying the theory concepts.							
		4. Use appropriate tools to design verify and test the CPU architectu	are.						
		5. Understand the theory of memory system design	•,						
		6. Understand the architecture and functionality of central processin	ig unit.						
Units	Contents	7. Exemplify in a better way the 1/O and memory organization.	Total Hrs						
I	Computer Syste	m Technology:	10						
1	From Compone	nts to Applications Computer Systems and Their Parts Generations	10						
	of Progress, H	Processor and Memory Technologies, Peripherals, I/O, and							
	Communications	s, Software Systems and Applications							
	<b>Computer</b> Perfo	rmance:							
	Cost, Performance	ce, and Cost/Performance, Defining Computer Performance,							
	Performance Enh	ancement and Amdahl's Law, Performance Measurement vs							
	Modelling, Repor	rting Computer Performance, The Quest for Higher Performance	10						
п	Instructions a	and Addressing:	10						
11	Instructions Log	d and Store Instructions, Jump and Branch Instructions, Addressing							
	Modes	a and Store instructions, jump and Branch instructions, Addressing							
	Procedures and	Data:							
	Simple Procedur	e Calls, Using the Stack for Data Storage, Parameters and Results,							
	Data Types, Arra	ays and Pointers, Additional Instruction							
	Assembly Langu	age Programming							
III	Number Repres	entation:	10						
	Positional Numb	er Systems, Digit Sets and Encodings, Number-Radix Conversion,							
	Signed Integers,	Fixed-Point Numbers, Floating-Point Numbers							
	Adders and Sim	ple ALUS: Carry Propagation Networks, Counting and Incrementation, Design							
	of Fast Adders I	ogic and Shift Operations, Multifunction ALUS							
	Multiplier and d	lividers, Floating-Point Arithmetic							
IV	Instruction Exe	cution Steps:	10						
	A Small Set o	f Instructions, The Instruction Execution Unit, A Single-Cycle Data							
	Path Branching	and Jumping, Deriving the Control Signals, Performance of the							
	Single-Cycle De	sign							
	Control Unit Sy	ynthesis: A Multicycle Implementation, Clock Cycle and Control							
	Microprogramm	ing Dealing with Exceptions							
V	Main Memory (	ancents.	10						
	Memory Structure	e and SRAM. DRAM and Refresh Cycles. Hitting the Memory Wall	10						
	Pipelined and In	terleaved Memory, Non-volatile Memory, The Need for a Memory							

	Hierarchy	
	<b>Cache Memory Organization:</b> The Need for a Cache What Makes a Cache Work?	
	Direct-Mapped Cache Set-Associative Cache Cache and Main Memory Improving	
	Cache Performance	
	Mass Memory Concepts, Virtual Memory and Paging	
VI	Input/output Devices :	10
	Input/output Devices and Controllers ,Keyboard and Mouse ,Visual Display Units ,	
	Hard-Copy Input/output Devices ,Other Input/output Devices , Networking of	
	Input/output Devices	
	Input/output Programming : I/O Performance and Benchmarks ,Input/Output	
	Addressing , Scheduled I/O: Polling, Demand-Based I/O: Interrupts , I/O Data	
	Transfer and DMA ,Improving I/O Performance	
	Buses, Links, and Interfacing, Context switching, interrupts	
	Text Books:	
	1)Computer Architecture From Microprocessors to supercomputers by Behrooz	
	Parhami Oxford	
	Reference Books:	
	1. Digital Logic and Computer Design Morris Mano, Pearson Education	
	2. Carl Hamacher, Z. Varnesic and S Zaky," Computer Organization". Tata McGraw-	
	Hill, 5th Edition, ISBN: 13 9781259005275.	
	3. Stallings, William Computer organization and architecture designing for	
	performance. Pearson Education India, 2000. 2. M. Morris, R. Mano Logic	
	Fundamentals and Computer Design, Prentice Hall of India, 4 th Edition, 2007.	
	4. David A. Patterson and John L. Hannessy Computer Organization and Design: The	
	Hardware and Software Interface, Morgan Kaufmann, Elsevier, 4th Edition, 2012.	
	5. John Hayes, Computer Architecture and Organization, Tata McGraw Hill, 5 th	
	Edition, 1996.2002.	

Course Code	1MCS2
Course Name	2 Data Structure with OOP
Total Credits	4
Course	Upon completion of this course successfully, students would be able to
Outcomes	
	<ol> <li>Learn the concepts of linear data structures such as arrays, linked lists, stacks and queues.</li> </ol>
	2. Learn the concepts of non-linear data structures such as trees& Graph.
	3. Learn and understand various data searching and sorting methods with its complexity.
	<ol> <li>Demonstrate operations such as insertion, deletion, searching and traversing on data structures.</li> </ol>
	<ol> <li>analyse and apply specific sorting and searching methodsdepending upon factors like type of data, volume of data.</li> </ol>
	<ol> <li>Learn &amp;Understand B-tree indexing, hashing, collisionsprocessing and its applications.</li> </ol>
	7. Learn the fundamental concepts of data structures.
	8. Identify and Apply the fundamental concepts of data structures
	9. Apply Academic Skills & Critical Thinking Skills
Unit	Content Total Hrs

Unit I	Arrays, Matrices and Linked List, Arrays, Arrays the Abstract Data	10
	Type, Array Representation, Matrices, Special Matrices, The Linear	
	List- Array Representation, Data Objects and Structures, The Linear	
	List Data structure, Array Representation, Vector Representation,	
	Multiple List in a Single Array, Linear Lists- Linked Representation, Singly Linked Lists and Chains,	
	Circular	

	Lists and Header Nodes, Doubly Linked Lists, Sparse Matrices and	
	its Representation Searching in Arrow & Linked List	
I Laid II	Representation, Searching in Array & Linked List.	10
Unit II	Stacks and Queues, Stack: Definition and Application, Array	10
	Representation, Linked Representation, Applications, Queues:	
	Definition and Application, Array Representation, Linked	
	Representation, Applications, Priority Queue,	
Unit II	Trace: Terminology and Concente Dinery and Other Trace. Trace	10
Onit II	Dinary Trace Droportion of Dinary Trace Depresentation of Dinary	10
	Trace Common Dinery Trace Operations Dinery Trace Traversel The	
	ADT Dinary Treas. The Class linked Dinary Treas. Amplication	
	ADI Binary Irees, The Class linked Binary Irees, Application, Binary Secret Trees, Definition, Abstract Data Tomas, Dinary Secret	
	Binary Search Trees, Definition, Abstract Data Types, Binary Search	
	Balanced Search Trees AVI Trees	
Unit IV	Sorting: Internal Sorting Ontimal Sorting Time Sorting Objects	10
011111	Insertion Sort Selection Sort Merge Sort Quick Sort Hean Sort	10
	Radiy Sort External	
	Sorting: Run Generation, Sorting with Tapes, Sorting with Disks.(10	
Unit V	Graphs: Definition, Representation of Graphs, Graph Implementation,	10
	Graph Traversals, Application of Graph Traversals, Minimum Cost	
	Spanning Trees, Shortest Path Problems, All Pair Shortest Paths.	
	(10	
Unit VI	Indexing: Indexed Binary Search Trees, B-Trees: Indexed Sequential	10
	Access Method (ISAM), m-Way Search Trees, B-Trees of Order m,	
	Height of a B- Tree, Searching a B-Tree, Inserting into a B-Tree,	
	Deletion from a B-Tree, Node Structure, Hashing: Hash Function,	
	Collision Resolution, Rehashing,	
	Extensible Hashing.(10	
	1 ext books:	
	1. Data structure algorithms and Applications in C++ . Sartaj San (Second Edition Universities Press)	ani
	Peterence Books:	
	1 "Introduction to Data Structures" - Rhagat Singh & T	L Nans
	2 "Data structures using C"-Tanenhaum Langeam Aug	enstein PHI
	3 "Classic Data Structures" - D Samanta PHI	
	4 "Data structure and Program design in C" - Kruse La	ing Tondo
	(PHI)	ing, ionuo
	5 "Data structure" - Tenenhaum	
	6 "Data structure and algorithm analysis in $C++$ ". N	lark Allan
	Welss	
	Addison Wesley	

Course Code	1MCS3
Course	3 Data Base Management Technologies
Name	
<b>Total Credits</b>	4

Course	Course Outcomes: On completion of this course, students would be able to:	
Outcomes	CO1:Analyze Database Management System & its Architecture and design ER model.	
	CO2: Implement database queries using database languages and normalize the	
	database design using normal forms.	
	CO3: Write queries and PL/SQL Code blocks for given requirements, using different	
	SQL and PL/SQL concepts.	
	<b>CO4:</b> Apply different query processing, optimizing, indexing and hashing techniques	
	in real-time database.	
	CO5: Apply Transaction Management concepts, concurrency control concepts and	

	deadlock handling concepts in real-time situations	
	<b>CO6:</b> Use advanced database Programming concepts like Parallel databases,	
TL-•4	Distributed database & Object-based database for processing data.	Tatal
Unit	Contents	l otal Hrs
Unit I	Introduction to Database System and Data Modelling:	10
	Introduction to Database Management Systems, Purpose of Database Systems,	
	Database-System	
	Applications, view of Data, Data Models, Database Languages, Relational	
	Databases, Database Architecture, Structure,	
	its types. Attributes. Relationships. Constraints. Keys. Design Process. Entity	
	Relationship Model, ER Diagram, Design Issues, Extended E-R Features,	
	Converting E-R & Enhanced -ER diagram into tables.	
	Case Study: Design ER Model for any real time application and convert the same into	
	tables	
	on paper.	1.0
Unit II	Relational Database Design:	10
	Detabase Scheme Keys, Scheme Diagrams, Pelational Query Languages	
	Relational Operations Attributes and Domains, CODD's Rules	
	<b>Relational Integrity Constraints:</b> Key Constraint Referential Integrity constraint Entity	
	Integrity constraint, Domain constraint.	
	Relational Database Design: Features of Good Relational Designs, Normalization,	
	Atomic Domains and First Normal Form, Decomposition using Functional	
	Dependencies, Algorithms for Decomposition, 2NF, 3NF, BCNF.	
	Case Study: Convert ER-Diagram of Unit 1 to Relational Database and apply	
Unit III	SOL and PL/SOL ·	10
e inte int	<b>SOL</b> : Characteristics and Advantages, SOL Data Types and Literals, DDL, DML,	10
	DCL. TCL.SOL Operators. <b>Tables:</b> Creating. Modifying. Deleting. Updating. <b>SOL</b>	
	DML Queries: SELECT Query and clauses, Index and Sequence in SQL. Views:	
	Creating, Dropping, Updating using Indexes, Set Operations, Predicates and Joins,	
	Set membership, Tuple Variables, Set comparison, Ordering of Tuples, Aggregate	
	Functions, SQL Functions, Nested Queries. Relational Algebra and Relational	
	Calculus.PL/SQL: Concept of Stored Procedures and Functions, Cursors, Triggers,	
	Assertions, Roles and Privileges.	
Unit IV	Storage and File Structure: Overview of Physical Storage, Magnetic Disk and Flash	10
	Storage, RAID, Tertiary Storage, File Organization, Organization of Records in Files,	10
	Data-Dictionary Storage, Database Buffer,	
	Indexing and Hashing: Ordered Indices, B+-Tree Index Files and its Extensions,	
	Static Hashing and Dynamic Hashing, Comparison of Ordered Indexing and Hashing,	
	Bitmap Indices, Some General Issues Concerning Indexing.	
	Query Processing and Optimization: Measures of Query Cost, Query Operation:	
	Selection, Sorting and Join Operation, Evaluation of Expression, Transformation of Relational	
	Expressions, Estimating Statistics of Expression Results Choice of Evaluation Plans	
		1

Unit V	Transaction Management: Transaction concept, Transaction states, ACID properties,	10
	Transaction and Schedules, Concurrent Execution of Transactions, Lock Based	
	Concurrency Control .	
	Concurrency control and Recovery System: ,Serializability and	
	Recoverability, Lock management, Specialized locking techniques,	
	Concurrency control without locking, Dealing Deadlocks: Deadlock handling,	
	detection, prevention & Recovery.	
	Recovery System: Shadow-Paging Recovery and Log-Based Recovery,	
	Checkpointing, Crash recovery. Database Security: Database Security Issues,	
	Discretionary Access Control Based on Grant & Revoking Privilege, Mandatory	
	Access Control and Role Based Access	
	Control for multilevel security.	
Unit VI	Advances in Databases Emerging Databases:	10
	Parallel Database: I/O Parallelism, Interquery Parallelism, Intraquery	
	Parallelism, Intraoperation Parallelism, Interoperation Parallelism, Query	
	Optimization.	
	Distributed Databases: Homogeneous and Heterogeneous Databases, Distributed	
	Data Storage, Distributed Transactions, Commit Protocols, Concurrency Control in	
	Distributed Databases, Availability, Distributed Query Processing, Heterogeneous	
	Distributed Databases, Cloud-Based Databases.	
	Object-Based Databases: Complex Data Types, Structured Types and Inheritance in	
	SQL, Table Inheritance, Array and Multiset Types in SQL, Object-Identity and	
	Reference Types in SQL, Implementing O-R Features, Object-Relational Mapping.	
	Case Study-Use of NoSQL/MapReduce/Hadoop/MongoDB databases for processing	
	unstructured data from social media with Nested Data Types like : JSON/ XML/	
	Object-Relational Database System/ Spatial Data	
	Text books:	
	1. "Database System Concepts", 6th Edition by Abraham Silberschatz, Henry F.Kort	th, S.
	Sudarshan, McGraw-Hill.	
	Reference Books:	
	1. S.K.Singh, "Database Systems : Concepts, Design and Application".	
	2. C. J. Date, "An Introduction to Database Systems", Addison-Wesley, 8th Edition	
	3 Connally T Begg C "Database Systems- A Practical Approach to Design	
	Jumplementation and Management" Design Education 5th Edition	
	Implementation and Wanagement, Pearson Education, 5th Edution.	
	4. Elmasri and S B Navathe, "Fundamentals of Database Systems" 7th edition, Pears	son.
	5. Ivan Bayross, "SQL, PL/SQL the Programming Language of Oracle", BPB Publi	cations.
	6. Kevin Roebuck, "Storing and Managing Big Data - NoSQL, HADOOP and More	e".
1		

Course Code	1MC84
Course Name	4 Computer Network & Wireless Communications
Total Credits	4
Course Outcomes	Course Outcome:
	Upon completion of this course successfully, students would be able to
	1. Apply cellular concepts to evaluate the signal reception performance in a cellular network and traffic analysis to design cellular network with given quality of service constraints.
	2. Determine the type and appropriate model of wireless fading channel based on the system parameters and the property of the

	wireless medium.	
	3. Analyse and design receiver and transmitter diversity techniqu	ies.
	4. Determine the appropriate transceiver design of multi-antenna	L
	5 Design windless communication systems with here 2C (a s	
	5. Design wireless communication systems with key 3G (e.g., $CDMA$ ) and $4G$ (OEDM) technologies	
	CDMA) and 40 (OFDM) technologies.	ed.
	6. Describe and differentiate four generations of wheless standar	u
	ior centular networks.	
<b>T</b> T •4		ILun
Units		Hrs
1	Introduction to Wireless Communication Systems:	10
	Examples of wireless Communication Systems: Paging Systems, Cordiess Telephone Systems, Cellular Telephone, Systems, How a Cellular Telephone, Call is Made	
	Comparison of Common Wireless Communication Systems. Trends in Cellular Radio and	
	Personal Communications.	
	modern wireless communication system: Wines Local Loop (WIL) and LMDS,	
	Wireless Local Area Networks (WLAN), Bluetooth and Personal Area Networks (PANs)	
	The Cellular Concept-System Design Fundamentals: Introduction Frequency	
	Considerations	
	Mobile Radio Propagation: Large-Scale Path Loss : Introduction to Radio Wave	
	Propagation, Free Space Propagation Model ,Relating Power to Electric Field The Three	
	Basic Propagation Mechanisms	
	Mobile Radio Propagation: Small-Scale Fading and Multipath : Small- Scale	
	Multipath Propagation, Factors Influencing Small-Scale Fading, Doppler Shift Impulse	
	Response Model of a Multipath Channel, Relationship Between Bandwidth and Received Power Small Scale Multipath Measurements Direct RF Pulse System Spread Spectrum	
	Sliding Correlator Channel Sounding	
	Frequency Domain Channel Sounding	
	Modulation Techniques for Mobile Radio: frequency modulation vs	10
II	Amplitude modulation.	10
	Equalization ,Diversity, and Channel Coding : Introduction, Fundamentals of	
	Equalization, Training A Generic Adaptive Equalizer , Algorithms for Adaptive	
	Equalization, Zero Forcing Algorithm, Least Mean Square Algorithm, Recursive Least	
	Squares Algorithm ,Summary of Algorithms, Fractionally Spaced Equalizers, Diversity	
	Techniques, Derivation of Selection Diversity Improvement, Derivation of Maximal Ratio	
	Eeedback or Scanning Diversity Maximal Ratio Combining Equal Gain Combining	
	Polarization Diversity, Frequency Diversity, Time Diversity, Interleaving, Fundamentals	
	of Channel Coding, Convolutional Codes, Decoding of Convolutional Codes, The Viterbi	
	Algorithm ,Other Decoding Algorithms for Convolutional	
	Codes),Coding Gain .	

III	<b>Speech Coding :</b> Introduction, Characteristics of Speech Signals, Quantization Techniques , Uniform Quantization, Non-uniform Quantization, Adaptive Quantization , Vector Quantization, Adaptive Differential Pulse Code Modulation (ADPCM) , Frequency Domain Coding of Speech, Sub-band Coding, Adaptive Transform Coding, Vocoders, Channel Vocoders, Formant Vocoders, Cepstrum Vocoders , Voice-Excited Vocoder, Linear Predictive Coders, LPC Vocoders, Multipulse Excited LPC, Code-Excited LPC, Residual Excited LPC, Choosing Speech Codes for Mobile Communications, The GSM Codec, The USDC Codec, Performance Evaluation of Speech Coders.	10
IV	<b>Multiple Access Techniques for Wireless Communications</b> : Introduction, Introduction to Multiple Access, Frequency Division Multiple Access (FDMA), Time Division Multiple Access (TDMA), Spread Spectrum Multiple Access, Frequency Hopped Multiple Access (FHMA), Code Division Multiple Access(CDMA), Hybrid Spread Spectrum Techniques, Space Division Multiple Access(SDMA), Packet Radio, Packet Radio Protocols, Pure ALOHA, Slotted ALOHA, Carrier Sense Multiple Access (CSMA) Protocols, Reservation Protocols, Reservation ALOHA, Packet Reservation Multiple Access (PRMA),Capture Effect in Packet Radio, Capacity of Cellular Systems, Capacity of Cellular CDMA, Capacity of CDMA with Multiple Cells, Capacity of Space Division Multiple Access.	10
V	<b>Wireless Networking</b> : Introduction to Wireless Networks, Differences Between Wireless and Fixed Telephone Networks, The Public Switched Telephone Network (PSTN), Limitations in Wireless Networking, Merging Wireless Networks and the PSTN, Development of Wireless Networks, First Generation Wireless Networks, Second Generation Wireless Networks, Third Generation Wireless Networks, Fixed Network Transmission Hierarchy, Traffic Routing in Wireless Networks, Circuit Switching, Packet Switching, The X.25 Protocol, Wireless Data Services, Cellular Digital Packet Data (CDPD), Advanced Radio Data Information Systems (ARDIS), RAM Mobile Data (RMD),Common Channel Signaling (CCS),The Distributed Central Switching Office for CCS, Integrated Services Digital Network (ISDN), Broadband ISDN and ATM, Signaling System No. 7 (SS7), Network Services Part (NSP) of SS7, Message Transfer Part (MTP) of SS7, Signaling Connection Control Part (SCCP) of SS7, The SS7 User Part, Integrated Services Digital Network User Part (ISUP), Transaction Capabilities Application Part (TCAP),Operation Maintenance and Administration Part (OMAP), Signaling Traffic in SS7,SS7 Services , Performance of SS7,An Example of SS7-Global Cellular Network Interoperability, Personal Communication Services/Networks (PCS/PCNs) , Packet vs. Circuit Switching for PCN, Cellular Packet-Switched Architecture Network Functionality in Cellular Packet-Switched Architecture, Protocols for Network Access, Packet Reservation Multiple Access (PRMA), Network Databases, Distributed Database for Mobility Management, Universal Mobile Telecommunication System (UMTS)	10
VI	Wireless Systems and Standards: AMPS and ETACS, AMPS and ETACS	10
	System Overview, Call Handling in AMPS and ETACS, AMPS and ETACS Air	

Interface, N-AMPS ,United States Digital Cellular 11.2.1 USDC Radio Interface (IS-54	
and IS-136), United States Digital Cellular Derivatives (IS-94 and 15-136), Global	
System for Mobile (GSM), GSM Services and Features, GSM System Architecture, GSM	
Radio Subsystem, GSM Channel Types, GSM Traffic Channels (TCHS), GSM Control	
Channels (CCH), Example of a GSM Call, Frame Structure for GSM, Signal Processing in	
GSM, CDMA Digital Cellular Standard (18-95), Frequency and Channel Specifications	
Forward CDMA Channel. Convolutional Encoder and Repetition Circuit. Block	
Interleaver, Long PN Sequence Data Scrambler Power Control Subchannel, Orthogonal	
Covering, Quadrature Modulation Reverse CDMA Channel, Convolutional Encoder	
Block Interleaver Orthogonal Modulation and Symbol Repetition. Variable Data Rate	
Transmission. Direct Sequence Spreading	
Ouadrature Modulation, IS-95 with 14.4 kbps Speech .CT2 Standard for Cordless	
Telephones Coder [ANS95].CT2 Services and Features. The CT2 Standard, Digital	
European Cordless Telephone (DECT) Features and Characteristics DECT Architecture	
DECT Functional Concept DECT Radio Link PACS Personal Access Communication	
Systems PACS System Architecture PACS Radio Interface Pacific Digital Cellular	
(PDC) Personal Handy phone System (PHS) US PCS and ISM Bands US	
Wireless Cable	
Television Summary of Standards Throughout the World	
Television, Summary of Standards Throughout the World.	
Text Books:	
Theodore S. Rappaport : Wireless Communication (II Edition), Pearson	
 Deference Dealer	
1. Vorn A. D. "Wireless Date Technologies" : Wiley	
<b>2</b> D EG "G (T (1 D (1 D )) (D )) (D ) (D )	
2. Ray ES : "Space/Terrestrial Mobile Network Internet access & QOS, :Wiley	
3. Rai Zing : "Multihop Wireless Networks, Wiley	
4. Yu Kwang, Ricky Klark, VincntK.N.Lau : wireless Internet & Mobile	
ComputingInteroperability & Performance" : Wiley	

# Skill-I

Course	1MCS5
Code	
Course	4-Advanced Java/ Ns2/ Tools
Name	
Credits	
Course Outcomes	1. Advanced Java: Upon completion of this course successfully, students would be able to
	<ol> <li>become familiar with the advanced features of Java Language</li> <li>Design a desktop application which can used for many kind of clients.</li> <li>Gain the knowledge of J2EE architecture, MVC Architecture.</li> <li>Design a web application which can work as a dynamic web with the help of JDBC.</li> </ol>

5. Develop an application which can also be connected with the database.
6. To understand Java Servlets and their life cycle
7. To understand Java server Pages (JSP) technology
8. To develop JSP Custom tags and use them in JSP pages
2. NS-2 Tool:
Upon completion of this course successfully, students would be able to
1. demonstrate operation of network
2. simulate and demonstrate the performance of GSM and CDMA
3. implement data link layer and transport layer protocols.
4. Demonstrate Installation procedure of the required software in groups and
document the same in the journal.

Sr.	Contents	Total
No.		Hrs
	The following information can be used as guidelines for basic	
	understanding of Advance Java Programming and NS-2 tool.	
	Advanced Java: It is an advanced technology or advance version of Java specially designed to develop web-based, network-centric or enterprise applications. It includes the concepts like Servlet, JSP, JDBC, RMI, <u>Socket programming</u> , etc. It is a specialization in specific domain. Most of the applications developed using advance Java uses tow-tier architecture i.e. Client and Server. All the applications that run on Server can be considered as advance Java applications. JEE (advance Java) provides libraries to understand the concept of Client- Server architecture for web- based applications. It is also important understand the advance Java if you are dealing with trading technologies like Hadoop, cloud-native and data science. There is a number of advance Java frameworks like, Spring, Hibernate, Struts, that enables us to develop secure transaction- based web applications such as banking application, inventory management application.	
	Topic covers: Basics of a Web application, Web Container and Web Application Project Set up, J2EE and Web Development, Advance Networking, , Java Server Pages, Hibernate Framework , Java Web Frameworks: Spring MVC, Spring Boot Framework, Java Server Faces, Session Management, JSP Tag library Examples:	

1) Write a client program to send any string from its standard input to the	
server program. The server program reads the string, finds number of	
characters and digits and sends it back to client program. Use connection-	
2) Write down Five Basic steps to establish IDBC connection from Java	
Application. Also mention sample code for each step.	
3) Write down the Program for testing the Servlet and study deployment descriptor.	
4) Write down the Program which displays the simple JSP file.	
5) Create database of student subject-wise data and retrieve all data using JSP	
and generate xml structure along with DID and XML Schema definition	
6) Using Spring remplate manages Database and Transaction.	
Use JSF Standard Components and Facelets Tags.	
NS-2 tool:	
NS2 stands for Network Simulator Version 2. It is an open-source event-	
networks	
Features of NS2:	
1. It is a discrete event simulator for networking research.	
2. It provides substantial support to simulate bunch of protocols like TCP,FTP, UDP, https and DSR.	
3. It simulates wired and wireless network.	
4. It is primarily Unix based.	
5. Uses TCL as its scripting language.	
6. Otcl: Object oriented support	
7. Telel: C++ and otel linkage	
8. Discrete event scheduler	
Basic Architecture:	
NS2 consists of two key languages: C++ and Object-oriented Tool Command Language (OTcl). While the C++ defines the internal mechanism (i.e., a backend) of the simulation objects, the OTcl sets up simulation by assembling and configuring the objects as well as scheduling discrete events. The C++ and the OTcl are linked together using TclCL	

1	1. All the files will be zip format
-	2. Now let's begin with installing Tcl.
3	3. Install Tk
2	4. Install OTcl:
4	5. Install Tclcl-1.19
(	5. Install ns-2.34:
	7. Install NAM
8	3. Install xgraph
	Examples:
1)	To create scenario and study the performance of token bus
•	protocolthrough NS2 simulator.
2)	To create scenario and study the performance of token ring protocols through NS2 simulator.
3)	To Simulate and to study stop and Wait protocol by using NS-2 Simulator.
4)	To simulate and study the Distance Vector routing algorithm by using NS-2 Simulator.
5)	To simulate and study the link state routing algorithm by usingNS-2 Simulator.
6)	To create scenario and study the performance of CSMA / CD protocol through NS-2 Simulator.
7)	To Simulate and to study of Go Back N protocol through NS-2 Simulator.
8)	To simulate a wireless sensor network using NS2.
9)	To simulate a Mobile Adhoc network (MANET) using NS2.
10)	To implement a Transport Control Protocol in sensor network through the Network Simulator 2

## Elective-I

Course Code	1MCS6(1)	
Course Name	Discrete Mathematical Structure	
Credits	4	

Course	Upon completion of this course successfully, students would be able to	
Outcomes	1 discuss fundamental concents and tools in discrete mathematics	
	2. Understand sets and perform operations and algebra on sets. Determine	
	properties of relations, identify equivalence and partial order relations,	
	sketch relations. Identify functions and determine their properties.	
	3. assess the curricular skills acquired by students at college level through	
	Assignments, Unit test, Internal Test, Group Discussion/Seminar/Mini	
	Project, Study Tour	
	4. Discuss fundamental concepts and tools in discrete mathematics with	
	emphasis on their applications to computer science.	
	5. Use mathematically correct terminology and notation.	
	6. Construct correct direct and indirect proofs.	
	7. Apply logical reasoning to solve a variety of problems.	<b>T</b> ( 1
Unit	Content	1 otai hours
TT.::4 T	Mathematical logic: Introduction statements and notations connectives –	10
Unit I	negation, conjunction, disjunction, Statement formulas and truth tables,	10
	conditional, bi- conditional, well formed formulas, Tautologies, Equivalence of	
	formulas, Duality law, Tautological implications, functionally complete sets of	
	connectives, other connectives, Normal and principal normal forms, completely	
	parenthesized infix and polish notations, Theory of inference for statement	
	of inference consistency of premises and indirect method of proof	
I Init II	Set theory: Basic concepts of set theory, representation of discrete	10
Unit II	structures, relations and ordering: relations, properties of binary relations in a	
	set, relation matrix and graph of a relation, partition and covering of a set,	
	equivalence relation, compatibility relations, composition of binary relations,	
	Functions – composition of functions, Inverse function.	
Unit III	Algebraic Structures: Algebraic systems: Examples and general	10
	properties, Semigroups and monoids, Grammar and Languages, Polish	
	expressions and their compilation, Groups Definition and examples, subgroups	
	communication model and basic notions	
	generation of codes by using parity checks, error recovery in group codes	
Unit IV	Lattices and Boolean algebra: Lattice as POSETs, definition, examples and	10
	properties, Lattice as algebraic systems, sublattices, Direct product and	
	homomorphism, Special lattices, Boolean algebra - definition and examples,	
	subalgebra, Direct product and homomorphism, Boolean functions,	
	representation and minimization of Boolean Finite state machines.	10
Unit V	<b>Graph theory:</b> Basic concepts of graph theory – definitions, paths,	10
	and manipulation of graphs, trees representation and operations list structures	
	and graphs Simple precedence graphics-syntax terminology a view of	
	parsing, notion and use of	
	precedence relations, formal definition of precedence relations.	
Unit VI	Fault detection in combinational switching circuits - Faults in	10
	combinational circuits, Notions of Fault detection, Algorithm for generating a	
	tault matrix, procedure for detection of faults; Introduction to computability	
	regular grammars. Turing machines and partial recursive functions	

Text books: 1. Discrete Mathematical Structures – Bernard Kolman, Robert Busby, S.C. Ross and Nadeemur- Rehman (Pearson Education)	
<ul> <li>Reference Books:</li> <li>1. Discrete Mathematical Structures with applications to computer science- J.</li> <li>P. Tremblay &amp;R Manohar (McGraw Hill Editions)</li> <li>2. Discrete mathematics - Semyour Lipschutz, Marc Lipson (MGH), Schaum's outlines.</li> <li>3. Discrete mathematics and its applications - Kenneth H. Rosen (AT&amp;T Bell Labs)(mhhe.com/ rosen)</li> </ul>	
Course Material/Learning Resources	
Weblink to Equivalent MOOC on SWAYAM if relevant:	
https://onlinecourses.nptel.ac.in/noc20_cs37/preview	
https://onlinecourses.nptel.ac.in/noc19_cs67/preview	
https://onlinecourses.swayam2.ac.in/cec20_ma02/preview	
https://www.classcentral.com/course/swayam-discrete-mathematics-	
5217	
Weblink to Equivalent Virtual Lab if	
relevant:	
https://virtuallabs.merlot.org/vl_math.ht	
ml	
http://vlabs.iitb.ac.in/vlabs- dev/labs/mit_bootcamp/signals/labs/exp1/simulation.php	
https://computing.llnl.gov/topic/discrete-mathematics	
Any pertinent media (recorded lectures, YouTube, etc.) if relevant:	
https://www.youtube.com/watch?v=wGLTV8MgLIA&list=PLU6Sqd Yc YsfJ27O0dyuMwafS3X8CecqUg	
https://www.youtube.com/watch?v=YBb2oYIzXK0&list=PLxCzCO Wd7 aiH2wwES9vPWsEL6ipTaUS13	
https://www.youtube.com/watch?v=NuGDkmwEQ	
bM	
https://www.youtube.com/watch?v=pCyuJgmr7	
W8 https://www.youtube.com/watch?v=q4L-	
wUF3yig	

Course Code	1MCS6(2)
Course Name	Entrepreneurship Development
Total Credits	04

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Course Outcomes		se Outcomes	Course Outcome: Upon completion of this course successfully, studen	nts would be able to
			<ul> <li>understand the Key concepts underpinning entrepreneu application</li> <li>analyse the recognition and popularization of product/ process opportunities.</li> </ul>	rship and its service/
			<ul> <li>apply new ideas, methods and ways of thinking</li> <li>create new business plan and marketing it.</li> <li>investigate the issues associated with securing and mar financial resources in new and established organisation</li> <li>design creative strategies for pursuing, exploiting and developing new opportunities.</li> </ul>	naging 1s. d further
	Units		Contents	Total
	I	The Nature an	d Importance of Entrepreneurs: Nature and Development	Lectures
		of Entrepreneursh Decision Process, Development, En Responsibility of E <b>The Entrepren</b> Process, Manageri Interest in Intrapreneursh Intrapreneurship in	ip, Definition of Entrepreneur today, The Entrepreneurial Types of Startups, Role of Entrepreneurship in Economic trepreneurial Careers and Education, Ethics and Social Entrepreneurial and Intrapreneurial Mind: The Entrepreneurial al versus Entrepreneurial Decision Making, Causes for neurship, Corporate versus Intrapreneurial Culture, Climate p, Intrapreneurial Leadership Characteristics, Establishing the Organization, Problems and Successful Efforts.	10
	Ш	The Individua Background and Systems, Male v Entrepreneurs vers International International Entrep Firm, International into International B	<ul> <li>I Entrepreneur: Entrepreneurial Feelings, Entrepreneur Characteristics, Motivation, Role Models and Support ersus Female Entrepreneurs, Minority Entrepreneurship, us Inventors</li> <li>Entrepreneurship Opportunities: The Nature of preneurship, The Importance of International Business to the versus Domestic Entrepreneurship, Entrepreneurial Entry usiness, Barriers to International Trade</li> </ul>	10
	III	Creativity and Generating Ideas, Planning and Devel Legal Issues fo Selecting a Lawy Business Method Product Safety and	the Business Idea: Sources of New Ideas, Methods of Creative Problem Solving, Opportunity Recognition, Product opment Process, E-Commerce and Business Start-Up r Entrepreneur: Intellectual Property, Need for a Lawyer, er, Legal Issues in Setting Up the Organization, Patents, Patents, Trademarks, Copyrights, Trade Secrets, Licensing, Liability, Insurance, Contracts	10
	IV	The Business I Partof the Business Plan-Read the Pl Presenting the Plan Writing the Busin Investigating the fa The Marketing Venture, Understa Plan, The Marketin Planning, Why Son	<ul> <li>Plan: Creating And Starting The Venture: Planning as so Operation, Write the Plan, Scope and Value of the Business an, Potential Lenders and Investors Evaluate the Plan, a, Information Needs, Using the Internet as a Resource Tool, mess Plan, Using and Implementing the Business Plan, allure of Business Plan.</li> <li>Flan: Industry Analysis, Marketing Research for the New noting the Marketing Plan, Characteristics of a Marketing and Marketing marketing Plan, Contingency me Plans Fail</li> </ul>	10

V	The Organizational Plan: Developing the Management Team, Legal Forms of Business, Tax Attributes of Forms of Business, The Limited Liability Company versus the S Corporation, S Corporation, The Limited Liability Company, Designing the Organization, Building the Management Team and a Successful Organization Culture, The Role of a Board of Directors, The Board of Advisors ,The Organization and Use of Advisors The Financial Plan: Operating and Capital Budgets, Pro Forma Income Statement, Pro Forma Cash Flow, Pro Forma Balance Sheet , Break-Even Analysis , Pro Forma Sources and Applications of Funds , Software Packages	10
VI	<ul> <li>Sources Of Capital: An Overview, Personal Funds, Family and Friends, Commercial Banks, Role of SBA in Small Business Financing, Research and Development Limited Partnerships, Government Grants, Private Placement, Bootstrap Financing</li> <li>Informal Risk Capital and Venture Capital: Financing the Business, Informal Risk-Capital Market, Venture Capital, Valuing Your Company, Deal Structure</li> </ul>	10
	<b>Text Books:</b> Robert D. Hisrich, Michael P. Peters, Dean A. Shepherd: "Entrepreneurship" (Sixth Edition) Tata McGraw Hill Education Private Limited, Special Indian Edition.	
	Reference Books:         i       Rajeev Roy "Entrepreneurship" Oxford HigherEducation.         ii.       Colombo Plan Staff College for Technical Education, Manila "Entrepreneurship Development" Tata McGraw-Hill.         iii.       Vasant       Desai "Entrepreneurship Development" Himalaya Publishing House.	

Course Code	1MCS6(3)	
Course Name	Research Methodology	
Total Credits	4	
Course Outcomes	Upon completion of this course successfully, students would be able to	
	<ol> <li>draw upon foundational knowledge, learn, adapt and successfully apply analy computational approaches on changing societal and technological challenges</li> <li>Demonstrate the ability to choose methods appropriate to research aims a objectives.</li> <li>Understand the limitations of particular research methods.</li> </ol>	tical and nd
	The curricular skills acquired by students should be assessed at college/univer- department level through Assignments,Unit test, Internal Test, Group Discussion/Seminar/Mini Project, Study Tour	sity
Unit	Content	Total Hrs

Unit I	<b>Introduction:</b> Meaning of Research, Objectives of Research, Motivation in Research, Types of Research, Research Approaches, Significance of Research, Research Methods versus Methodology, Research and Scientific	10
	Method, Importance of Knowing How Research is Done, Research Process, Criteria of Good Research	
Unit II	Defining the Research Problem: What is a Research Problem, Selecting the Problem, Necessity of Defining the Problem, Technique Involved in Defining a ProblemResearch Design: Meaning of Research Design, Need for Research Design, Features of a Good Design, Important Concepts Relating to Research Design	10
	Different Research Designs, Basic Principles of Experimental Designs	
Unit III	Methods of Data Collection: Collection of Primary Data, Observation Method, Interview Method, Collection of Data through Questionnaires, Collection of Data through Schedules, Difference between Questionnaires and Schedules, Some Other Methods of Data Collection, Collection of Secondary Data, Selection of Appropriate Method for Data Collection	10
Unit IV	<b>Processing and Analysis of Data:</b> Processing Operations, Some Problems in Processing, Elements/Types of Analysis, Statistics in Research, Measures of Central Tendency, Measures of Dispersion, Measures of Asymmetry (Skewness), Measures of Relationship, Simple Regression Analysis, Multiple Correlation and Regression, Partial Correlation, Association in Case of Attributes, Other Measures	10
Unit V	Sampling Design: Census and Sample Survey, Implications of a Sample Design, Steps in Sampling Design, Criteria of Selecting a Sampling Procedure, Characteristics of a Good Sample Design, Different Types of Sample Designs, Select a Random Sample, Random Sample from an Infinite Universe, Complex Random Sampling Designs	10
Unit VI	<b>Interpretation of Data and Paper Writing</b> : Layout of a Research Paper, Journals in Computer Science, Impact factor of Journals, When and where to publish ? Ethical issues related to publishing, Plagiarism and Self-Plagiarism.	10
	Text books: 1. Handbook of Research Methodology- Dr. Shanti Bhushan Mishra, Dr. Shashi Alok Educreation Publishing	
	<ul> <li>Reference Books:</li> <li>1. Business Research Methods – Donald Cooper &amp; Pamela Schindler, TMGH, 9th edition</li> <li>2. Business Research Methods – Alan Bryman &amp; Emma Bell, Oxford University Press.</li> <li>3. Research Methodology – C.R. Kothari</li> </ul>	

Course Code	1MCS6(4)
Course Name	Management Information System
Total Credits	04

Course Outcomes	Course Outcome: Upon completion of this course successfully, students would be al	
	<ol> <li>Understand the leadership role of Management Information Systems in achieving business competitive advantage through informed decision making.</li> <li>Analyze and synthesize business information and systems to facilitate evaluation of strategic alternatives.</li> </ol>	

	<ol> <li>Effectively communicate strategic alternatives to facilitate decisi making. Evaluate the role of information systems in today's competit business environment.</li> <li>Assess the relationship between the digital firm, electronic commer electronic business and internet technology.</li> </ol>		
Units	Contents		Total Lectures
Ι	MIS concepts, defi academics, MIS supp and process of manag business.	inition, Role, Impact of MIS, MIS and computers, MIS and bort to Management, Role and importance of management. MIS gement MIS in organization structure and strategic management	10
II	Basics of MIS: Do organizational decision concepts and classific information, organizat Development of MIS	becision making, Decision methods, behavioural concepts, on making, MIS and decision make concepts, Information; eation, Methods of data and information collection: value of ation and information. Humans an information processor. and choice of IT.	10
III	Applications of MI sector, Introduction to in service industries an philosophy, determinis of DSS. MIS in Enterg	IS: Applications in manufacturing sector, applications in service service, sector, Creating a destructive services, MIS applications and role of MIS in source industries. DSS: Concepts and stic systems and knowledge based expert systems. MIS and role prise Management System.	10
IV	Technology in MIS processing, Informatio Technologies, client S	S: Data processing, Transaction processing, Application on System processing, TQM of IS. DBMS: Object Oriented Server Arch. And MIS.	10
V	MIS and Networks: Technology, Business organization, Value str	Network Topology, LAN, Data Communication, ATM Process Reengineering: Introduction BP, Process Model of ream model, Delays in BP, Relevance of IT, MIS and BPR.	10
VI	MIS and Data warel organization. Manage Models, WWW, E-pa	house: Architecture, Design and Justification of data warehouse, ement and implementation of data -warehousing, E-Business: syment, security in E-business, MIS and E-business.	10
	<b>Text Books:</b> W. S. Jawadekar : ]	Management Information System (II Edition), (TMH)	
	Reference Books: 1. Kenneth C. Land Pearson Education. 2. Voichdan, Home 3. A. K.Gupta and	don & J. P. Landon.: Management Information System, 8th Ed. er, Information Systems for operation & Mgmt. J.K. Sharma: Management of Systems (Macmillan)	

Course Code	1MCS6(5)
Course Name	Data Science and Analytics
Total Credits	04
	Upon completion of this course successfully, students would be able to
Course Outcomes	1. Analyze and interpret data using an ethically responsible

r		
	<ul><li>approach</li><li>2. Use appropriate models of analysis, assess the qual insight from results, and investigate potential issues</li></ul>	ity of input, derive
	3. Apply computing theory, languages, and algori mathematical and statistical models, and the principle appropriately formulate and use data analyses	thms, as well as as of optimization to
	<ol> <li>Formulate and use appropriate models of data analy solutions to business-related challenges</li> <li>Interpret data findings effectively to any audience</li> </ol>	rsis to solve hidden
	in written formats	orany, visuany, and
Units	Contents	Total Lectures
Ι	The Art of Data Science: Volume, Velocity, Variety, Machine Learning, Supervised and Unsupervised Learning, Predictions and Forecasts, Innovation and Experimentation, The Dark Side- Big Errors, Privacy, Theories, Models, Intuition, Causality, Prediction, Correlation	10
II	<b>Review of Maths :</b> Exponentials, Logarithms, and Compounding, Normal Distribution ,Poisson Distribution, Moments of a continuous random variable, Combining random variables , Vector Algebra Statistical Regression , Diversification , Matrix Calculus , Matrix Equations	10
III	<b>Open Source: Modelling in R</b> : System Commands , Loading Data, Matrices, Descriptive Statistics, Higher-Order Moments, Quick Introduction to Brownian Motions with R , Estimation using maximum- likelihood, GARCH/ARCH Models ,Introduction to Monte Carlo, Portfolio Computations in R , Finding the Optimal Portfolio, Root Solving, Regression, Heteroskedasticity, Auto-regressive models, Vector Auto-Regression , Logit , Probit ,Solving Non-Linear Equations, Web- Enabling R Functions	10
IV	<b>MoRe: Data Handling and Other Useful Things</b> : Data Extraction of stocks using quantmod, Using the merge function, Using the apply classof functions, Getting interest rate data from FRED, Cross-Sectional Data (an example), Handling dates with lubridate, Using the data.table package, Another data set: Bay Area Bike Share data, Using the plyr package family	10
V	<b>Being Mean with Variance: Markowitz Optimization</b> : Quadratic (Markowitz) Problem, Solving the problem with the quadprog package, Tracing out the Efficient Frontier, Covariances of frontier portfolios: rp,rq , Combinations, Zero Covariance Portfolio ,Portfolio Problems with Riskless Assets, Risk Budgeting	10

VI	Learning from Experience: Bayes Theorem: Introduction, Bayes and Joint Probability Distributions, Correlated default (conditional default), Continuous and More Formal Exposition , Bayes Nets , Bayes Rule in Marketing ,Other Applications	10
	Text Books: Data Science : Theories, Models, Algorithms and Analytics by Sanjiv Ranjan Das	
	<b>Reference Books:</b> I. Beginning Data Science in R by Thomas Mailund , Apress Publications II. Getting Started with Data Science, making sense of data with analytics by Murtaza Haider, Published by Pearson plc	

## Laboratories

Course Co	de	1MCS7	
Course Na	me	Lab-I 1,2 - Programming(C/C++/Java/ALP)	
Total Cred	lits	-	
Course Ou	tcomes	Course Outcome: Upon completion of this course successfully, students would	ld be able to
		<ol> <li>Demonstrate the use of various OOPs concepts with the helprograms.</li> <li>Describe the procedural and object oriented paradigm wit concepts of classes, functions, data and objects.</li> <li>Demonstrate the programs for the implementation of constructors, destructors and function overloading.</li> <li>Use the syntax and semantics of java programming langua</li> <li>Design event driven GUI and web related applications whi the real word scenarios.</li> <li>Get Familiarized with the assembly level programming.</li> </ol>	lp of h ge. ch mimic
Cont	tents		Total Hours
The problem of the li 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11.	sample list of a statements bi st is to inform Write a progra Write a progra	<ul> <li>a programs is given below. This list can be used as a guideline for at the scope of the laboratory should not be limited to the same. Aim about minimum expected outcomes.</li> <li>a min C to perform various operations to implement Arrays.</li> <li>a min C to perform various arithmetic operations for implementing</li> <li>a min C to implement Structure Programming.</li> <li>a min C to implement various File Handling operations.</li> <li>a min C to implement various loops and a control statement.</li> <li>a min C++ to implement function overloading.</li> <li>a min C++ to implement abstract base classes.</li> <li>a min C++ to implement abstract base classes.</li> <li>a min C++ to implement Inline function.</li> <li>a min C++ to implement to a database using JDBC.</li> </ul>	

12. Write a program in JAVA for handling Mouse events and Key events.
13. Write a program in JAVA that implements a multi-thread application.
14. Write a program in JAVA that simulates a traffic light using GUI.
15. Write a program in JAVA that computes factorial value using Applet.
16. Write a program in JAVA to implement Concept of matrices.
17. Write a program in JAVA to create user defined package.
18. Programs in JAVA to implement Exception Handling.
19. Write an ALP program to implement reverse of a given string.
20. Write a program in ALP for addition of two 16-bit number using 16-bit registers.
21. Write a program in ALP to exchange of two 8-bit number using XCHG instructions.
22. Write a program in ALP to increment and decrement of two 8-bit number
23. Write an ALP program to find the LCM & HCF of given numbers.
24. Write an ALP program to move a block of data from one memory location to the other.
25. Write an ALP program to perform multi byte addition and subtraction.

GIC

Course Code	1MCS8		
Course Name	Lab-II 3-SQL/ DBMS tools, MS-SQL, My Sql		
Total Credits			
Course Outcomes	Course Outcomes:		
	Upon completion of this course successfully, students would	ld be able to	
	1 Demonstrate the Basics Concents and SOL Queries of Data	hase	
	Management System.	ibuse	
	2. Apply the Conceptual Design Model and Database Hierarch	ical	
	Structure to construct the real-world requirement.		
	3. Analyze the various constraints to populate the database the	rough	
	SQL Queries.		
	4. Implement different working concepts of DBMS using SQ	L	
	Queries.		
	5. Present the result of database creation and querying pro	cess,	
	aocument n.		
Contents		Total	
		Hours	
The sample list of nroblem statements h	t programs is given below. This list can be used as a guideline for but the scope of the laboratory should not be limited to the same. Aim		
of the list is to inform	about minimum expected outcomes.		
1. Implementation	on of Creating and managing SQL table.		
2. Concept Desi	gn with E-R Model		
3. Different data	a types and its implementation		
4. Implementation	on of Relational Operators		
5. Implementation	on of Logical operator		
6. Implementation	on of Aggregate function		
7. Implementation	on of Constraints		
Not null, U	Jnique, Primary key, Foreign key, Check, Default, Create index		
<ol> <li>a. Implementation</li> <li>a. Implementation</li> </ol>	on of DML and DCL commands		
10 Implementation	on of TCL commands		
11. Perform Join	Inner join. Outer join. Natural join		
12. Implementatio	on of Advance queries. Subquery and Grouping		
13. Implementation	on of Cursors		
14. Implementation	on of Triggers		
15. Implementation	on of Procedures and functions		
16. Implementati	on of Views		
17. Creating Data	abase /Table Space		
• 1	Aanaging Users: Create User, Delete User		
• 1	Aanaging roles:-Grant, Revoke.		

Course	Name	GIC1: User Experience Design	
Unit	Conte	ents	
Unit I	What	is UX Strategy?, The Four Tenets of UX Strategy, Validating the Value	
	Proposit	ion, Conducting Competitive Research.	
Unit II	Cond	ucting Competitive Analysis, Storyboarding Value Innovation, Creating Prototypes for	
	Experim	ents.	
Unit III	Cond	ucting Guerrilla User Research, Designing for Conversion, Strategists in the Wild	
Referen	ce Book:	UX Strategy by Jaime Levy, Foreword by Jason Calacanis, SPD ORILLY	
Publication	Publication.		

Course Name	GIC2: Effective Email Communication
Units	Contents
Unit I	<ul> <li>Why Email:</li> <li>Email: The Hearth of the Internet,</li> <li>Email's Undeserved Bad Rap,</li> <li>The different Types of Email Communication: Email Newsletters, Catalog Emails, Announcement Emails, Press Releases, Sales and Sign-up Process Emails.</li> </ul>
Unit II	<ul> <li>Planning and Email Campaign:</li> <li>Planning is Essential,</li> <li>Meeting Our Client: The Modern Henchman Magazine Client Briefing,</li> <li>Setting Goals,</li> <li>Measuring Success,</li> <li>Planning Your Content: An Email: An Email is Not a Website, Email in the Real World, Planning the Modern Henchman Newsletter.</li> </ul>
Unit III	<ul> <li>Design for the Inbox:</li> <li>Does Email really need Designing?,</li> <li>Designing Plain Text Email: Guidelines for a Readable Plain Text Email,</li> <li>The Plain Text Version of the Modern Henchman Newsletter,</li> <li>The Case for HTML Email,</li> <li>Designing HTML Email: The Design Environment for Email, Essential Elements of an Effective Email, Adapting a Website Design in to an Email Design, Layout Possibilities, Designing to Meet Business Goals.</li> </ul>
<b>Reference Boo</b> publication.	ok: Creating Stunning HTML Email by Mathew Patterson, sitepoint SPD

### Semester-II Core Subjects

Course Code	2MCS1
Course	1 Operating System Algorithms

Name			
Tota	l Credits	4	
Cour	se	Course Outcome:	
Outcom	ies	Upon completion of this course successfully, students would be able to	
		<ol> <li>Analyze basic components of Operating Systems and various types of Operating Systems 2. understand and implement the mechanism of an OS to handle multiple processes a threads and their communication.</li> <li>analyze different mechanisms involved in memory management OS.</li> <li>find the loopholes in the system to resolve the problem of deadlock.</li> <li>study the components and management aspects of concurrency management</li> <li>study and analyze the problems in distributed Operating System.</li> </ol>	stems. and
Units		Contents	Total
I	Design Conseque Operating Implemen Impler Creation, interrupt H Waiting Paralle with a Sh process v grouping o	<b>Techniques I :</b> Design Techniques, Interface Design-Overview, Motivation, Applicability, nces, Related Design Techniques, Connection in Protocols- Overview, Motivation, System Examples, Computer Science Examples, Applicability, Consequences, tation issues and variations, related design techniques. <b>nenting Processes:- The system call interface,</b> Implementation of Processes:- Process Process States, Process Dispatching, The System Stack, Timer Interrupts, System call andling- copying messages between address spaces, Implementation of Waiting- g for Messages, Waiting inside a system Call, suspending System Calls <b>el Systems-</b> Parallel Hardware, An Operating System for a Two-Processor, Race Conditions hared Process Table, Atomic Actions, A Multiprocessor Operating System, The current ariable, dispatching with a shared process table, busy waiting, handling the queues, of shared variables, a general solution, using two process tables.	Lectures 10
Π	Interprocess Communication patterns- Patterns of Interprocess communication- Competing and Cooperating Processes:-Everyday Scheduling, First-Come. First-Served Scheduling, Shortest Job- First Scheduling, highest-Response-Ratio-Next Scheduling, Priority Scheduling, Deadline Scheduling, Round-Robin Scheduling, Summary, Preemptive Scheduling Methods - Scheduling Overview, Round-Robin Scheduling, Heavily Loaded Systems, Two Queues, Multiple Queues, Two phase locking, starvation, Message Passing Variations- Using PIDs as Message, Message passing with non blocking sends, remote procedure calls, Semaphores:- Specifications of Semaphores operations, Implementation of Semaphore, an analogy, mutual exclusion with Semaphores, Rendezvous with Semaphores, procedure- consumer with Semaphores, counting Semaphores, procedure consumer with Semaphores, Semaphores and messages		10
III	Design computer overview, applicabil - overvie	<b>Techniques II:-</b> Indirection- overview, motivation, operating system examples, science example, discussion, applicability, consequences, Using State Machines - operating system examples, computer science example, ity, consequences, implementation issues and variations, Win Big, Then Give Some Back w, operating system examples, computer science example,	10

	applicability, consequences, Using Models for Inspiration- overview, operating system examples, computer science example, applicability, consequences <b>Memory Management</b> - Levels of Memory Management, Linking and loading a process– creating a load module, loading a load module, allocating memory in a running process, Dynamic memory allocation, Examples of dynamic memory allocation- logical and physical memory, allocating memory to processes, static memory management, handling variable sized processes, Multiprogramming Issues, Memory protection, memory management system calls- static allocation of memory to processes, dynamic of memory to processes, What about New and Malloc, Freeing Memory at Each Level, A Different Memory Management system call	
IV	<ul> <li>Virtual Memory - Sharing the processor and sharing the money, swapping-efficient resources use and user needs, Overlays- Overlays in PC, Implementing Virtual Memory- hardware required to support virtual memory, software required to support virtual memory, What is the cost of Virtual Memory- Paging more than one process, locality, virtual memory management, Daemons and Events, File Mapping- the system call interface, an example of using file mapping, advantages of file mapping, memory and fle mapping on the IBM 801</li> <li>Virtual Memory Systems - Global Page replacement algorithms - measuring the performance of page replacement algorithm, optimal page replacement, theories of program paging behavior, random page replacement, First In first out FIFO Page, Least Recently Used Page Replacement, Approximations of LRU, Clock Algorithm, Paging the operating system address space- locking page in memory, page sizes- reason for large page size, reason for small page size, clustering pages, Segmentation- What is segment, virtual memory with segmentation, segmentation, segmentation, segmentation terminology</li> </ul>	10
V	<ul> <li>Design Techniques III :- Multiplexing - overview, operating system examples, computer science example, applicability, consequences</li> <li>I/O Devices:- I/O system software- Device driver, device driver interface, the two categories of device drivers, the block device interface, the character device interface, Device numbers, Unification of files and I/O devices,</li> <li>Generalised disk device drivers- Partitioning large disk, combining disks into a large logical disk, RAM disk, Memory as a device, Pseudo-ttys, Disk Caching</li> <li>File System:- File system Organization - What is a file system, File system structure, the file system descriptor, variations in file system layout, file system in disk partitions, combining file system, network mounting of file systems</li> </ul>	10
VI	<b>Design Techniques IV - Caching-</b> overview, motivation, operating system examples, computer science example, discussion, applicability, consequences, implementation issues and variations, related design techniques, <b>Resource Management -</b> Integrated Scheduling, Queuing models of Scheduling, Real time operating system, protection of resources- users and processes, the importance of protection of resources, resources that needs protection, what we are protecting against, authorization, authentication, security and protection analogies, general strategy for protection, parts of protection system, <b>User Authentication -</b> Password, system architecture, other methods of authentication, password variations, identifying objects, identifying as a person <b>Client - Server Model -</b> Three modes of communication, system processes- Overview,	10
the initial process, system constant, initialization, interrupt handling, handling system calls, the system calls handling code, user knowledge of message queue identifiers, protection of resources, disk interrupt handler, Disk I/O system process, Server Data Structure, <b>Micro kernel Operating system -</b> Tradeoffs of the client server model, Object oriented operating systems		
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Text Books:           1. Operating System - A design oriented approach Charles Crowley Tata McGraw           Hill Edition		
Reference Books:         1. Modern Operating Systems, Pearson Education A. S. Tanenbaum         2. Advanced Concepts in Operating System M. Singhal & N. Shivaratri         3. Distributed Operating System by A. S. Tanenbaum         4. Linux Kernel, 2nd Edition By Daniel P. Bovet, Oreilly         5. The Design of Unix Operating System Maurice Bach, Pearson		

Course Code	2MCS2		
Course Name	2 Graphics Application programming		
Total Credits	4		
Course Outcomes	Course Outcome: Upon completion of this course successfully, students would be able to		
	<ol> <li>Learn the fundamental concepts of Computer Graphics.</li> <li>Identify and Apply the fundamental concepts of Computer Graphics in Animation, Virtual Reality.</li> <li>Apply Academic Skills &amp; Critical Thinking Skills</li> <li>understand the mathematical modelling of graphical objects to be drawn/used in different kind of applications.</li> <li>Learn and understand the concepts of computer graphics, including viewing projection, perspective, modelling and transformation in 2D &amp; 3D.</li> <li>Learn and understand the algorithms to generate line segments, polygon an transformations, windowing and clipping.</li> </ol>	g, d its	
	<ol> <li>Demonstrate operations such as various fransformation and frojection.</li> <li>Demonstrate various algorithms for scan conversion and filling of basic ob and their comparative analysis.</li> <li>Implement display control, 3D geometry, primitives and conversions, algorithms for hidden surfaces and lines, concepts of shading and curves.</li> </ol>	jects	
Units	Contents	Total Lectures	
Unit I	Geometry and line generation: Introduction, Points and Lines, Planes and Coordinates, Line segments, Perpendicular line segments, Vectors, Pixels and Frame Buffers, Vector generation, Character generation, Displaying the frame buffer. Graphics primitive: Introduction, Display devices, Primitive operations, The Display-File Interpreter, Normalized	10	

	device coordinates, Display-file structure, Display control.	
Unit II	Polygon: Introduction, Polygon, Polygon representation, Entering polygon, An inside test, Filling polygon, Antialiasing. Transformations: Introduction, matrices, scaling transformations, sin and cos, sum of angles, identifiers, rotation, homogeneous coordinates and translation, rotation about an arbitrary point, other transformations, display procedures.	10
Unit II	Segments: Introduction, the segment table, segment creation, closing a segment, deleting a segment, renaming a segment, visibility, image transformations, saving and showing segments, other display file structures, Some Raster techniques, Windowing and clipping: Introduction, viewing transformation, implementation, clipping, clipping the polygon, Adding Cclipping to the system, Generalized Clipping.	10
Unit IV	Interaction : Introduction, hardware, input devices-handling Algorithm, Event handling, Sample devices, The delectability attributes, Simulating a Locator with a Pick and Pick with a Locator, Echoing, Interactive Techniques. Three dimensions: Introduction, 3D Geometry, Primitives and Transformations, Rotation about an arbitrary axis, Parallel projection, Perspective projection, Viewing parameters, Conversion to View Plane Coordinates, The 3D Viewing Transformation.	10
Unit V	Hidden Surfaces and Lines: Introduction, Back face removal &algorithm, Z Buffers, Scan-Line algorithm, The Painter's algorithm, Comparison Techniques, Warnock's algorithm, Franklin algorithm, Hidden Linemethod, Binary Space Partition, An Application.	10
Unit VI	Shading: Introduction, diffusion, illumination, point source illumination, specular reflection, transparency and shadows. Curves: Introduction, curve generation, implementation, interpolating polygons, E-splines, B-Splines and Curves.	10
	Text books:         1. "Computer Graphics A Programming approach"- Steven Harington PHI	
	Reference Books:         1. "Computer Graphics, C Version" - Donald Hearn, M. Pauline Baker         -         2. (Prentice Hall Press)         3. "Interactive Computer Graphics"- Newmann and Sproul         4. "Computer Graphics"- Rogers.	

Cou	rse Code	2MCS3	
Course Name Total Credits		3 Software Engineering	
		4	
Cou	rse Outcomes	<ul> <li>Course Outcome: Upon completion of this course successfully, students would be able to</li> <li>1. identify the need for engineering approach to software development processes of requirements analysis for software engineering problems.</li> <li>2. Analyse various software engineering models and apply methods for development of software projects.</li> <li>3. Work with various techniques, metrics and strategies for Testing software proj</li> <li>4. Identify and apply the principles, processes and main knowledge areas f Project Management</li> <li>5. Proficiently apply standards, CASE tools and techniques for engineering projects</li> </ul>	o and various design and jects. for Software ng software
Units	Contents		Total Lectures
	Prescriptive Pr Process Models, C What is an Agile 1 Extreme Program Requirements M Analysis: Overall Requirements Mod Refining a Prelimin Context of Softw Attributes, The Ev Separation of Con Aspects, Refactori Software Architect Descriptions, Arc Taxonomy of A Architectural Des Architectural Des Architecture Into Design: What Is a View, Designing Guidelines, Cohes Control, Reduce th and Design: Inter Patterns, Kinds of WebApp Design: Quality?, Software Quality,	rocess. Models: The Waterfall Model, Incremental Process Models, Evolutionary oncurrent Models, A Final Word on Evolutionary Processes. Agile Development: Process?, Agility Principles, The Politics of Agile Development, Human Factors. nming (XP): XP Values, The XP Process, Industrial XP, The XP Debate. odeling : Scenarios, Information And Analysis Classes: Requirements Objectives and Philosophy, Analysis Rules of Thumb, Domain Analysis, leling Approaches, Scenario-Based Modeling: Creating a Preliminary Use Case, nary Use Case, Writing a Formal Use Case, Design Concepts: Design within the vare Engineering, The Design Process: Software Quality Guidelines and olution of Software Design, Design Concepts: Abstraction, Architecture, Patterns, neerns, Modularity, Information Hiding, Functional Independence, Refinement, ing, Object-Oriented Design Concepts, Design Classes, Architectural Design: eture: What is Architecture?, Why Is Architecture Important?, Architectural hitectural Decisions, Architectural Genres, Architectural Styles: A Brief urchitectural Styles, Architectural Patterns, Organization and Refinement, sign: Representing the System In Context, Defining Archetypes, Refining the Components, Describing Instantiations of the System, Component- Level Component? An Object-Oriented View, The Traditional View, A Process Related Class-Based Components, Basic Design Principles, Component-Level Design ion, Coupling, User Interface Design: The Golden Rules: Place the User in the User's Memory Load, Make the Interface Consistent, User Interface Analysis face Analysis and Design Models, The Process, Pattern-Based Design: Design Patterns, Frameworks, Describing a Pattern, Pattern Languages and Repositories, WebApp Design Quality, Quality Management: Quality Concepts: What Is Garvin's Quality Dimensions, McCall's Quality Factors, Targeted	

	Quality Factors. The Transition to a Quantitative View	
II	Software Quality Assurance: Elements of Software Quality Assurance, SQA Tasks, Goals and Metrics: SQA Tasks, Goals, Attributes, and Metrics, Formal Approaches to SQA: Statistical Software Quality Assurance: A Generic Example, Six Sigma for Software Engineering, Software Reliability: Measures of Reliability and Availability, Software Safety, Software Testing Strategies: A Strategic Approach to Software Testing: Verification and Validation, Organizing for Software Testing, Software Testing Strategy The Big Picture, Criteria for Completion of Testing, Strategic Issues, Test Strategies for Conventional Software: Unit Testing, Integration Testing, Test Strategies for Object-Oriented Software: Unit Testing in the OO Context, Integration Testing in the OO Context, Testing Conventional Applications: Software Testing Fundamentals, Internal and External Views of Testing, White Box Testing, Basis Path Testing: Flow Graph Notation, Independent Program Paths, Deriving Test Cases, Graph Matrices, Control Structure Testing: Condition Testing, Data Flow Testing, Loop Testing, Black Box Testing: Graph Based Testing Methods, Equivalence Partitioning, Boundary Value Analysis, Orthogonal Array Testing, Model Based Testing	10
Ш	Testing Web Applications: Testing Concepts for WebApps: Dimensions of Quality, Errors within a WebApp Environment, Testing Strategy, Test Planning, The Testing Process-An Overview, Content Testing: Content Testing Objectives, Database Testing, User Interface Testing: Interface Testing Strategy, Testing Interface Mechanisms, Testing Interface Semantics, Usability Tests, Compatibility Tests, Component-Level Testing, Navigation Testing: Testing Navigation Syntax, Testing Navigation Semantics, Formal Modeling And Verification: The Cleanroom Strategy, Functional Specification: Black Box Specification, State Box Specification, Clean Box Specification, Cleanroom Design: Design Refinement, Design Verification, Cleanroom Testing: Statistical Use Testing, Certification, Software Configuration Management: An SCM Scenario, Elements of a Configuration Management System, Baselines, Software Configuration Items, The SCM Repository: The Role of the Repository, General Features and Content, SCM Features, The SCM Process: Identification Audit, Status Reporting, Configuration Management for WebApps: Dominant Issues, WebApp Configuration Objects, Content Management, Change Management, Version Control, Auditing and Reporting	10
IV	Product Metrics: A Framework for Product Metrics: Measures, Metrics, and Indicators, The Challenge of Product Metrics, Measurement Principles, Goal-Oriented Software Measurement, The Attributes of Effective Software Metrics, Metrics for the Requirements Model: Function-Based Metrics, Metricsfor Specification Quality, Metrics for the Design Model: Architectural Design Metrics, Metrics for Object-Oriented Design, Class-Oriented Metrics-The CK Metrics Suite, Class-Oriented Metrics-The MOOD Metrics Suite, OO Metrics Proposed by Lorenz and Kidd, Component Level DesignMetrics, Operation- Oriented Metrics, User Interface Design Metrics, Managing Software Projects:Project Management Concepts: The Management Spectrum: The People, The Product, The Process, The Project, The Product: Software Scope, Problem Decomposition, The Process: Melding the Product and the Process, Process Decomposition, Process And	10

	<b>Project Metrics: Metrics in the Process and Project Domains:</b> Process Metrics and Software Process Improvement, Project Metrics, <b>Software Measurement:</b> Size-Oriented Metrics, Function-Oriented Metrics, Reconciling LOC and FP Metrics, Object-Oriented Metrics, Use Case-Oriented Metrics, WebApp Project Metrics, <b>Metrics for Software</b> <b>Quality:</b> Measuring Quality, Defect Removal Efficiency	
V	Estimation For Software Projects: Observations on Estimation, The Project Planning Process, Software Scope and Feasibility, Resources: Human Resources, Reusable Software Resources, Environmental Resources, Software Project Estimation, Decomposition Techniques: Software Sizing, Problem-Based Estimation, An Example of LOC-Based Estimation, An Example of FP- Based Estimation, Process-Based Estimation, An Example of Process-Based Estimation, Estimation with Use Cases, An Example of Use Case- Based Estimation, Reconciling Estimates, Project Scheduling: Basic Concepts, Project Scheduling: Basic Principles, The Relationship Between People and Effort, Effort Distribution, Defining a Task Set for the Software Project: A Task Set Example, Refinement of Software Engineering Actions, Scheduling: Time-line Charts, Tracking the Schedule, Tracking Progress for an OO Project, Scheduling for WebApp Projects, Risk Management: Reactive versus Proactive Risk Strategies, Software Risks, Risk Identification: Assessing Overall Project Risk, Components and Drivers, Risk Projection: Developing a Risk Table, Assessing Risk Impact, Risk Refinement	10
VI	<ul> <li>Maintenance And Reengineering: Software Maintenance, Software Supportability, Reengineering, Business Process Reengineering, Business Processes, A BPR Model, Software Reengineering: A Software Reengineering Process Model, Software Reengineering Activities, Reverse Engineering: Reverse Engineering to Understand Data, Reverse Engineering to Understand Processing, Reverse Engineering User Interfaces, Restructuring: Code Restructuring, Data Restructuring, Forward Engineering: The Economics of Reengineering</li> <li>Software Process Improvement: What Is SPI?: Approaches to SPI, Maturity Models, Is SPI for Everyone?, The SPI Process: Assessment and Gap Analysis, Education and Training, Selection and Justification, Installation/Migration, Evaluation, Risk Management for SPI, Critical Success Factors, The CMMI, The People CMM, Other SPI Frameworks, SPI Return on investment, SPI Trends</li> </ul>	10
	<b>Text Books:</b> 1. Software Engineering: A Practitioner's Approach. Roger S. Pressman, Seventhedition McGraw Hill International Edition.	
	<ul> <li>Reference Books:</li> <li>1. Software Engineering, A Precise Approach, Pankaj Jalote, Wiley India, 2010.</li> <li>2. Software Engineering: A Primer, Waman S Jawadekar, Tata McGraw-Hill, 2008</li> <li>3. Fundamentals of Software Engineering, Rajib Mall, PHI, 2005</li> <li>4. Software Engineering, Principles and Practices, Deepak Jain, Oxford University Press.</li> <li>5. Software Engineering1: Abstraction and modeling, Diner Bjorner, Springer Internationaledition, 2006.</li> <li>6. Software Engineering2: Specification of systems and languages, Diner Bjorner,</li> </ul>	

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	Springer International edition 2006.	
	7. Software Engineering Foundations, Yingxu Wang, Auerbach Publications, 2008.	
	8. Software Engineering Principles and Practice, Hans Van Vliet, 3rd edition, John Wiley	
	&SonsLtd.	
	10. Software Engineering 3: Domains, Requirements, and Software Design, D. Bjorner, Springer	
	International Edition.	
	10. Introduction to Software Engineering, R. J. Leach, CRC Press.	

Course Code		2MCS4	
Course Name		4 Data Mining and Data Warehousing	
Tota	l Credits	04	
Cour	rse Outcomes	Course Outcome:	
		Upon completion of this course successfully, stude	ents would be able to
		1. use basic concepts and techniques of Data Mining	
		2. develop skills of using recent data mining software for	or solving practical
		problems.	
		3. gain experience of doing independent study and research	l.
		4. study the methodology of engineering legacy d	atabases for data
		warehousing and data mining to derive business rules fo	r decision support
		systems.	
		5. Develop and apply critical thinking, problem-solving, ar	nd decision- making
TT. •4.		SKIIIS.	<b>T</b> ( )
Units		Contents	Total
-			Lectures
I	Introduction, Da	ta Mining Functionalities, Data Preprocessing: Data Cleaning,	10
	Data Integration at	Ind Transformation, Data Reduction, Data Discretization and	
	Concept merarchy	Generation.	
	Data Warehouse	and OLAP Technology: Overview, A Multidimensional Data	10
II	Model, Data Ware	house Architecture, Data Warehouse Implementation, From	
	Data Warehousing	to Data Mining.	
	Data Cube Compu	tation and Data Generalization: Efficient Methods for Data	
	Cube Computation,	Data Generalization and Concept Description.	
III	Mining Frequen	t Patterns, Associations, and Correlations: Basic Concepts,	10
	Efficient and Scalal	ble Frequent Itemset Mining Methods, Mining Various Kinds	
	of Association Rule	es, From Association Mining to	
	Correlation Analysi	s, Constraint-Based Association Mining.	
IV	Classification and	d Prediction: Issues, Classification by Decision Tree Induction,	10
	Bayesian Classif	ication, Rule-Based Classification, Classification by	
	Backpropagation. P	rediction: Linear Regression, Nonlinear Regression, Accuracy	
	and Error Measures	s, Evaluating the	
	Accuracy of a Class	sifier or Predictor.	

V	Cluster Analysis: Partitioning Methods, Hierarchical Methods, Density-Based Methods, Grid-Based Methods, Model-Based Clustering Methods, Clustering High-Dimensional Data. Mining Time-Series Data, Mining Sequence Patterns in Biological Data.	10
VI	Graph Mining, Social Network Analysis and Multirelational Data	10
	Mining. Mining Object, Spatial, Multimedia, Text, and Web Data, Data	
	MiningApplications, Trends in Data Mining.	
	Text Books:	
	Data Mining: Concepts and Techniques - J. Han, M. Kamber	
	<ul> <li>Reference Books:</li> <li>1 Data Mining: Introductory and Advanced Topics – Margaret H.Dunham, Pearson Education</li> <li>2. Data Warehousing in the real world - Sam Anahory, Dennis Murry, Pearson Education</li> <li>3. Principles of Data Mining - David Hand, Heikki Manila, Padhraic Symth, PHI</li> <li>4. Data Warehousing, Data Mining &amp; OLAP, Alex Bezon, Stephen J.</li> <li>SmithMcGraw-Hill Edition</li> <li>5. Data Warehousing Fundamentals, Paulraj Ponniah, Wiley- Interscience Publication</li> </ul>	

## SKILL-II

Course	2MCS5
Code	
Course	1-Operating system (Windows/Android/Linux)
Name	
Credits	4
Course	1. Operating system Algorithm:
Outcomes	Upon completion of this course successfully, students would be able to
	1. implement the mechanism of an OS to handle multiple processes and threads and their communication.
	2. simulate and demonstrate the performance mechanisms involved in memory management OS.
	3. demonstrate the loopholes in the system to resolve the problem of deadlock.
	4. simulate and demonstrate the performance the components and management aspects of concurrency management
	5. simulate and demonstrate the performance of the problems in distributed Operating Systems.
	2. Java: Upon completion of this course successfully, students would be able to
	1. become familiar with the advanced features of Java

	<ul> <li>Language</li> <li>Design a desktop application which can be used for many kinds of clients.</li> <li>Gain the knowledge of J2EE architecture, MVC Architecture.</li> <li>Design a web application which can work as a dynamic web with the help of JDBC.</li> <li>Develop an application which can also be connected with the database.</li> </ul>	
	<ol> <li>appry Java Services and then the cycle</li> <li>use Java server Pages (JSP) technology</li> <li>develop JSP Custom tags and use them in JSP pages</li> </ol>	
S r. No.	Contents	Total Hrs
	The following information can be used as guidelines for basic understanding of Operating system Algorithms using Java.	
	<ul> <li>UNIX: It is a multi-user operating system. Developed at AT &amp; T Bell Industries, USA in 110610. Ken Thomson and Dennis Ritchie developed it from the MULTICS (Multiplexed Information and Computing Service) OS. By11080, UNIX had been completely rewritten using C language.</li> <li>LINUX: It is similar to UNIX, which is created by Linus Torualds. All UNIX commands work in Linux. Linux is open source software. The main feature of Linux is coexisting with other OS such as Windows and UNIX.</li> <li>STRUCTURE OF A LINUX SYSTEM: It consists of three parts. a)UNIX kernel b) Shells c) Tools and Applications UNIX KERNEL: Kernel is the core of the UNIX OS. It controls all tasks, schedules all Processes and carries out all the functions of the OS. Decides when one program tops and another starts.</li> <li>SHELL: Shell is the command interpreter in the UNIX OS. It accepts command from the user and analyses and interprets them</li> <li>Topics Cover:-FCFS, SJF, Priority, Round robin CPU Scheduling algorithm, resource allocation, producer – consumer problem using semaphores, First fit/Best Fit / Worst Fit memory allocation algorithms, FIFO, LRU and Optimal Page Replacement algorithm, FCFS Disk Scheduling algorithm, Deadlock detection algorithm, SCAN and CSCAN Disk Scheduling algorithm, system calls of the operating system.</li> <li>1. Write a program to demonstrate the use of FCFS CPU Scheduling algorithm.</li> <li>2. Write a program to demonstrate the use of Priority CPU Scheduling algorithm.</li> <li>3. Write a program to demonstrate the use of Round Robin CPU Scheduling algorithm.</li> <li>4. Write a program to demonstrate the use of Round Robin CPU Scheduling algorithm.</li> </ul>	

5. Write a program to demonstrate the use of resource allocation to identify whether the system is in safe state.	
6. Write a program to implement the producer – consumer problem using semaphores.	
7. Write a program to demonstrate the use of First fit/Best Fit / Worst Fit memory allocation algorithms.	
8. Write a program to demonstrate the use of FIFO Page Replacement algorithm.	
9. Write a program to demonstrate the use of LRU Page Replacement algorithm.	
10. Write a program to demonstrate the use of Optimal Page Replacement algorithm.	
11. Write a program to demonstrate the use of FCFS Disk Scheduling algorithm.	
12. Write a program to demonstrate the use of the Deadlock detection algorithm.	
13. Write a program to demonstrate the use of SCAN Disk Scheduling algorithm.	
14. Write a program to demonstrate the use of CSCAN Disk Scheduling algorithm.	
15. Write a program to demonstrate the system calls of the operating system.	

## Elective-II

Course Code	2MCS6(1)	
Course Name	(1)Theory of Computation	
Total Credits	4	
Course Outcomes	<ul> <li>Course outcomes: Upon completion of this course successfully, students would be able to</li> <li>1. use basic concepts of formal languages of finite automata techniques</li> <li>2. Design Finite Automata's for different Regular Expressions and Languages</li> <li>3. Construct context free grammar for various languages</li> <li>4. solve various problems of applying normal form techniques, push down automata and Turing Machines</li> </ul>	
Units	Contents	Total Hours
Unit I	Strings, alphabets and languages, Graphs and trees, Inductive proofs, set notations, relations, Finite automata and regular Expression: Finite state system, Non deterministic finite automata, Finite automata with €-moves. Deterministic finite automata, equivalence between NFA and DFA, Conversion of NFA to DFA.	10

Unit II	<b>Regular set and regular expression,</b> Two way finite automata, finite automat with output, Applications of finite automata. Equivalence of RE and FA, Inter conversion, pumping lemma, closure property of regular sets, Regular grammars, Right linear and Left linear grammar, equivalence between Regular linear grammar and FA inter conversion between RE and RG.	10
Unit III	<b>Context free grammar</b> , derivation trees, Chomsky Normal Form, Greibach Normal Form. Push Down Automata: Definition, model, acceptance of CFL, equivalence of CFL and PDA, Interconversion, Enumeration of properties of CFL.	10
Unit IV	<b>Turing Machine:</b> Definition, model, Design of Turing machine, computablelanguages and function, Techniques of Turing machine construction, Modifications of Turing machine, Church's Hypothesis.	10
Unit V	<b>Chomsky Hierarchy of languages,</b> Linear bounded automata and context sensitive languages, Introduction of DCFL and DPDA, Decidability of problems.	10
Unit VI	<b>Undecidability:</b> Properties of recursive & non recursive enumerable languages, universal Turing machine, post correspondence problem, introduction to recursive function theory.	10
	Text books: 1. "Introduction to Automata theory, Languages and Computation"- Hopcraft J.E.& Ullman J.D.	
	<ul> <li>Reference Books:</li> <li>1. "An Introduction to Formal Languages and automata"- Peter Liz.</li> <li>2. "Introductory theory of Computer Science"- V. Krishnamurthy(EWP)</li> <li>3. "Elements of Theory &amp; Computations"- Lavis and Padadimitron-PHI.</li> </ul>	

Course Code	2MCS6(2)		
Course Name	2 Computer System Architecture		
Total Credits	04		
Course Outcomes	Course Outcome:		
	Upon completion of this course successfully, students would be able to		
	1. Understand the theory and architecture of central processing unit.		
	2. Analyze some of the design issues in terms of speed, technology,		
	cost, performance.		
	3. Design a simple CPU with applying the theory concepts.		
	4. Use appropriate tools to design verify and test the CPU architecture.		
	5. apply the concepts of parallel processing, pipelining and		
	interprocessor communication.		
	6. Understand the architecture and functionality of central		
	processing unit.		
	7. Exemplify in a better way the I/O and memory organization.		

	8. Define different number systems, binary addition and subtraction,		otraction,
	2's complement representation and operation		ns with this
		representation.	
Un :4-		Contents	Total
105			Lectures
1	Categories ,Comp. Instructions ,Instru Formats, Instruction Architecture , Intr Organization , Syst Subsystem Organiz Organization , Men Subsystem Configur	Architectures Levels of Programming Languages, Language iling and Assembling Programs, Assembly Language ction Types, Data Types ,Addressing Modes ,Instruction a Set Architecture Design, A Relatively Simple Instruction Set roduction To Computer Organization: Basic Computer tem Buses, Instruction Cycles, CPU Organization, Memory zation and Interfacing, Types of Memory, Internal Chip nory ration, I/O Subsystem Organization and Interfacing	10
II	Register Trans Language, Using I Components, Spec Complex Digital Sy CPU DESIGN: Spe CPU, Specifications Design and Implen Relatively Simple C ,Fetching and Decc Paths, Design of a the Control Unit Us	<b>fer Languages</b> : Micro-Operations and Register Transfer RTL to Specify Digital Systems, Specification of Digital ification and implementation of Simple System, More ystems and RTL, Module 6 Counter, Toll Booth Controller, ecifying a CPU, Design and Implementation of a Very Simple of or a Very Simple CPU, Fetching Instructions from Memory, nentation of a Relatively Simple CPU, Specifications for a CPU oding Instructions, Executing Instructions, Establishing Data Relatively Simple ALU, Designing ing Hardwired Control, Design Verification	10
III	Microsequencer Microsequencer Implementation of Generating the Corr the Micro-Operation Operations Using V Simple Microsequer Hardware and Micr Reducing the Numb Microprogrammed of instruction Set, Ease	<b>Control Unit Design:</b> Basic Microsequencer Design, Operations, Microinstruction Formats, Design and a Very Simple Microsequencer, The Basic Layout, rect Sequence and Designing the Mapping Logic , Generating ons Using Horizontal Microcode, Generating the Micro- ertical Microcode, Design and Implementation of a Relatively ncer, Modifying the State Diagram, Designing the Sequencing rocode, Completing the Design Using Horizontal Microcode, per of Microinstruction, Microsubroutines, Microcode Jumps, Control vs. Hardwired Control, Complexity of the e of Modification ,Clock Speed	10
IV	Computer Aria Multiplication, Div Two's Complement Addition and Subtr Numeric Format Multiplication and Systems, Cache Me ,Associative Memor Memory with Direc	thmetic: Unsigned Notation, Addition and Subtraction, ision, Signed Notation, Signed-Magnitude Notation, Signed- Notation, Binary Coded Decimal, BCD Numeric Format, action, Multiplication and Division, Floating Point Numbers, Numeric Characteristics, Addition and Subtraction, Division, Memory Organization: Hierarchical Memory mory ry, Cache Memory with Associative Mapping, Cache t Mapping, Cache Memory with Set-Associative	10

	Mapping, Virtual Memory, Paging, Segmentation, Memory Protection	
V	<b>Input/Output Organization</b> : Asynchronous Data Transfers, Source- initiated Data Transfer, Destination-Initiated Data Transfer, Handshaking, Programmed I/O, New Instruction, New Control Signals, New States and RTL Code, Modify the CPU Hardware for the New Instruction, Make Sure Other Instructions Still Work, Interrupts, Transferring Data Between the CPU and I/O Devices, Types of interrupts, Processing interrupts, Interrupt Hardware and Priority, Implementing interrupts inside the CPU, Direct Memory Access, Incorporating Direct Memory Access into a Computer System ,DMA Transfer Modes, Modifying the CPU to Work with DAM, 1/0 Processors ,Serial Communication, Serial Communication Basics ,Universal Asynchronous Receiver/ Transmitters (UARTs)	10
VI	<b>Reduced Instruction Set Computing :</b> RISC Rationale ,Fixed Length Instructions, Limited Loading and Storing Instruction Access Memory, Fewer Addressing Modes, Instruction Pipeline , RISC Instruction Sets, Instruction Pipelines and Register Windows, Instruction Pipelines ,Register Windowing and Renaming, Instruction Pipeline Conflicts ,Data Conflicts, Branch Conflicts, <b>Introduction To Parallel Processing :</b> Parallelism in Uniprocessor Systems, Organization of Multiprocessor Systems , Flynn's Classification System Topologies , MIMD System Architectures Communication in Multiprocessor Systems, Fixed Connections, Reconfigurable Connections, Routing on Multistage Interconnection Networks	10
	Text Books: Computer System Organization & Architecture – Johnd. Carpinelli,Publisher Pearson- Addison Wesley Longman	
	Reference Books:1. Computer Fundamentals Architecture and Organization" by Ram B2. Fundamentals of Computer Organization and Architecture (Wiley Series onParallel and Distributed Computing)" by Mostafa Abd–El–Barr and Hesham El–Rewini3. Fundamental of Computer Organization and Design" by Sivarama PDandamudi4. Computer Fundamentals, Third Edition: Architecture and Organization"by Ram B	

Course Code		2MCS6(3)	
Course N	ame	(3)Enterprise Resource Management	
Credits		04	
Course O	utcomes (COs)	<ul> <li>Upon completion of this course successfully, students would able to</li> <li>(1) build an understanding of the fundamental concepts of ERP systemic architecture, and working of different modules in ERP.</li> <li>(2) develop and design the modules used in ERP systems, and customize the existing modules of ERP systems.</li> <li>(3) Analyze the strategic options for ERP identification and adoption (4) Design the ERP implementation strategies.</li> <li>(5) Apply reengineered business processes for successful implementation.</li> <li>(6) Implement ERP system with different approaches</li> </ul>	be stems, d can 1. ERP
Units	Contents		Tot al Hrs
Ι	Enterprise Resou Defining Enterpris ERP Systems, Chara Applications, Techn During ERP Implem ERP Implementation	<b>Irce Planning- An Introduction</b> : se Resource Planning, Functional Modules in ERP Systems, Evolution of cteristics of ERP, Process Integration with ERP Systems, Benefits of ERP ology Behind ERP Systems, Implementation Costs, Challenges Faced nentation, Facts about h, Examples of ERP Implementation in India.	10
Π	ERP Mrket and Vendors:         ERP Market, ERP Vendors, Services-Oriented Architecture, ERP Package Features:         Comparison and Selection Criteria, ERP Packages: The Big Players.         Extended ERP Services:         Defining Extended ERP, SCM and ERP, ERP and BI, ERP and E-commerce.		10
III	Business Process Defining Busines Process Re-engineer Improvement), BPI Implementation, Me of IT in BPR, BPR Cases.	<b>Re-engineering and ERP:</b> ss Process Re-engineering, Enterprise Redesign Principles, Business ring (Process Innovation) versus Total Quality Management (Process R and Change Management, Different Approaches in BPR thodology for BPR Implementation, Role and ERP systems, BPR Success/ Failure Factors, BPR Implementation	10
IV	Planning for ER Planning for E Understanding Econ Implementation Ap Commitment, Realiz Implementation,	<b>P:</b> ERP Implementation, Understanding organizational Requirements, nomic and Strategic Justification, Analysing Project Scope and Broad proach, Determining Resources, Comprehending Top Management ing Organizational Commitment to Change and	10
V	Planning : Match for ERP Implementa Implementation. Implementation	ing Business Processes with the Right ERP Systems, Creating a Budget tion, Selecting the Right ERP Packages, Preparing Organizations for ERP of ERP:	10

VI	Design of ERP Systems, ERP Implementation Approaches, ERP Implementation Life Cycle, Examples: ERP Implementation Life Cycle <b>Managing ERP Projects:</b> Risk/ Failure Factors in ERP Implementation, Examples of ERP failure, Mitigating Implementation Risks: Critical Success Factors, Management and Complexity of Large-scale ERP Projects, Training Users to Use ERP Systems, Evaluating ERP Projects.	10
	<ul> <li>Text Book : Enterprise Resource Planning by Ashim Raj Singla,CENGAGE Learning</li> <li>Reference Book : <ol> <li>Concept of Enterprise Resource Planning, Third Edition, by Ellen F.Monk and Bret J. Wagner, CENGAGE Learning.</li> <li>Enterprise Resource Planning by <u>Alexis Leon</u>, Tata McGraw-Hill Education</li> <li>Enterprise Resource Planning, Fourth Edition by <u>Alexis Leon</u>, Tata McGraw-Hill</li> <li>Enterprise Resource Planning: Text &amp; Cases by <u>Rajesh Ray</u>, Tata McGraw-Hill</li> </ol> </li> </ul>	

Course Code		2MCS6(4)	
Course Name		(4)Mobile Computing	
Tota	l Credits	4	
Cour	rse Outcomes	Course Outcome:	
		Upon completion of this course successfully, students would	be able to
		1. Explain the basics of mobile Computing	
		2. Describe the functionality of Mobile IP and Transport	Layer
		3. Classify different types of mobile telecommunication sy	stems
		4. Demonstrate the Adhoc networks concepts and its rout	ing protocols
		5. Make use of mobile operating systems in developing mo	bile applications
Un	Contents		Hrs
its			
Ι	Mobile Comm	unications: An Overview 1 Mobile Communications, Mobile	10
	Computing, Mobile	e Computing Architecture, Mobile Devices, Mobile System Networks,	
	Data Dissemination	, Mobility Management, Security.	
	<b>Mobile Devices</b>	and Systems	
	Mobile Phones, I	Digital Music Players, Handheld Pocket Computers, Handheld	
	Devices: Operating	System, Smart Systems, Limitations of Mobile Devices, Automotive	
	Systems		
	CSM Somulaas a	nd Similar Arabitaatura	10
п	GSM Services a	nu Shimai Architecture Dadia Interfaces Drotocols Dadia Interfaces	10
11	Localization Callin	a Handover Security New Data Services	
		g manuover, security, new Data services	

	,General Packet Radio Service , High-speed Circuit Switched Data, DECT Wireless Medium Access Control and CDMA-based Communication Medium Access Control ,Introduction to CDMA-based Systems, Spread Spectrum in CDMA Systems ,Coding Methods in CDMA IST, IS-105 cdma One System, IMT-2000, i-mode, OFDM	
III	Mobile IP Network LayerMobile IP Network Layer, IP and Mobile IP Network Layers ,Packet Delivery andHandover Management , Location Management, Registration, Tunneling andEncapsulation, Route Optimization, Dynamic Host Configuration ProtocolMobile Transport LayerConventional TCP/IP Transport Layer Protocols , Indirect TCP , Snooping TCPMobile TCP, Other Methods of TCP-layer Transmission for Mobile, NetworksTCP Over 2.5G/3G Mobile Networks	10
IV	DatabasesDatabase Hoarding Techniques, Data Caching, Client-Server Computing and Adaptation,Transactional Models, Query Processing, Data Recovery Process Issues relating to Qualityof ServiceData Dissemination and Broadcasting SystemsCommunication Asymmetry, Classification of Data-Delivery Mechanisms, DataDissemination Broadcast Models ,Selective Tuning and IndexingTechniques, Digital Audio Broadcasting,	10
V	Data Synchronization in Mobile Computing SystemSynchronization, Synchronization Software for Mobile Devices, SynchronizationProtocols, SyncML-Synchronization Language for Mobile Computing Sync4J (Funambol),Synchronized Multimedia Markup Language (SMIL)Mobile Devices: Server and ManagementMobile Agent , Application Server, Gateways ,Portals ,Service Discovery ,Device Management, Mobile File Systems, Security	10
VI	Mobile Ad-hoc and Sensor Networks Introduction to Mobile Ad-hoc Network , MANET, Wireless Sensor Networks, Applications Mobile Application Languages –XML Java,J2ME,and Java Card Introduction ,XML, JAVA, Java 2 Micro Edition (J2ME) ,JavaCard Mobile OperatingSystems Operating System, PalmOS, WindowsCE, Symbian OS, Linux for Mobile Devices	10
	Text Books: Mobile Computing: Raj Kamal (Oxford)	
	Reference Books:1) Mobile Communication: Jochen Schiller (PE)2) Principles of mobile communication: Gordon L. Stuber (Springer)3) Wireless Communications: Principles and Practice: Theodore S. Rappaport(Pearson)	

Course Code	2MCS6(5)	
Course Name	(5)Compiler Construction	
Total Credits	4	
Course	Upon completion of this course successfully, students would be able to	
Outcomes		
	1. explore the principles, algorithms, and data structures involved in the design and	
	construction of compilers.	
	2. Write the machine dependent code	
	5. draw the flow graph for the intermediate codes.	
	4. Design a compiler for a simple programming language.	
Units	Contents	Total
		Hour
		S
Unit I	<b>Introduction to Compilers:</b> Overview, typical compiler Structure, implementation. Programming Language Grammars: Elements of formal language grammars, derivation, reduction, syntax tree, ambiguity, regular grammars and expressions	10
	Seenning and Darsing Techniques: The scanner, top down and bottom up	10
Unit II	parsing, syntax directed translation, Symbol table organization, Hash table organization, Linked List and Tree structured symbol tables, symbol table organization for structures and records.	10
Unit III	Memory Allocation: Static and dynamic memory allocation, array allocation	10
	and access, allocation for strings, structure allocation, common and equivalence allocation. Compilation of expressions.	
Unit IV	<b>Compilation of control structures</b> : Control transfers, procedural calls, conditional execution, iteration control constructs.	10
Unit V	Error detection, indication and recovery. Compilation of I/O statements: Compilation of I/O list, compilation of FORMAT list, the I/O routine, file control.	10
Unit VI	<b>Code optimization</b> : Major issues, optimizing transformations, local optimizations, program flow analysis, Global optimization, writing compilers.	10
	Text books:	
	1. Compiler construction – D.M. Dhamdhere, Macmillan India Ltd.	
	<ul> <li>Reference Books:</li> <li>1. Principles of Compiler Design – Alfred V. Aho, Jeffrey D. Ullman</li> <li>2. The Theory and Practice of Complier Writing – J.P. Trembly, P.G. Sorenson</li> <li>McGraw Hill Publication.</li> <li>3. Engineering a compiler – K.D. Cooper and Linda Torczon, Elsevier Direct Publ.</li> </ul>	

Course Code	2MCS7
Course Name	Lab-III 3,4-SE-Tools/DM Tools
Credits	2
Course Outcomes	Upon completion of this course successfully, students would be able to
	<ol> <li>Identify different actors and use cases from a given problem statement and draw use case diagram to associate use cases with different types of relationship.</li> <li>Draw a class diagram after identifying classes and association among them.</li> <li>Graphically represent various UML diagrams and associations among them and identify the logical sequence of activities undergoing in a system, and represent them pictorially.</li> <li>use modern engineering tools for specification, design, implementation and testing</li> <li>translate end-user requirements into system and software requirements</li> <li>generate a high-level design of the system from the software requirements.</li> <li>Provide a formal basis for understanding the modeling language.</li> <li>apply standard data mining methods and techniques such as association rules, data clustering and classification.</li> <li>Learn new, advanced techniques for emerging applications (e.g. social network analysis, stream data mining).</li> <li>Gain practical intuition about how to apply these techniques on datasets of realistic sizes using modern data analysis frameworks.</li> </ol>

Laboratorie	es
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Sr. No.	Contents	Total Hrs
The foll should not expected o	owing list of can be used as guidelines for basic understanding but the scope of be limited to this list. Aim of the list is to inform about minimum utcomes.	the laboratory
1	To prepare PROBLEM STATEMENT for any project.	
2	Identifying the Requirements from Problem Statements.	
3	Estimation of Project Metrics.	
4	Modeling UML Use Case Diagrams and Capturing Use Case	
	Scenarios.	
5	Estimation of Test Coverage Metrics and Structural Complexity.	
6	Designing Test Suites.	

7	To draw a sample ENTITY RELATIONSHIP DIAGRAM for real			
1	project or system by using IBM Rational Rose software			
8	To draw the Use Case Diagram using Rational Rose.			
10	To draw a sample activity diagram for real project or			
10	System IBM RationalRose software.			
10	To prepare STATE CHART DIAGRAM for any project IBM			
- •	Rational Rose Software.			
11	To draw the Sequence Diagram using IBM Rational Rose software.			
12	To draw the collaboration Diagram using IBM Rational Rose			
	software.			
13	To draw class diagram for any project by using IBM Rational Rose			
	Software			
14	Create a use- case diagram for tour management system and			
	library domain model by using Dia software.			
15	To create an ER diagram for hotel management system by using			
	Dia software.			
16	To create a component diagram for Bank management system by			
	using Diasoftware.			
17	Create a use- case diagram for tour management by using			
	Diasoftware.			
18	To create a library domain model by using Dia software.			
110	To find out complexities & create route testing for ATM			
• •	transaction using Dia software.			
20	To test load with the help of burst strategy in Soap UI tool.			
21	To perform the load testing with thread strategy in Soap UI tool.			
22	To perform a simple load testing by using Soap UI tool.			
23	To measures the load with variance strategy in Soap UI tool.			
24	Study and usage of any Design phase CASE tool			
25	Performing the Design by using any Design phase CASE tools.			
26	Develop test cases for unit testing and integration testing.			
27	Prepare a SRS document in line with the IEEE recommended			
	standards.			
	Data mining Tools used : Weka / Rapid miner			
	1. Create an Employee Table with the help of Data Mining Tool.			
	Description:			
	we need to create an Employee Table with training data set which			
	number			
	2 Create a Weather Table with the help of Data Mining Tool			
	2. Create a weather rable with the help of Data Minning root.			
	We need to create a Weather table with training data set which			
	includes attributes like outlook temperature humidity windy			
	play.			
	3. Apply Pre-Processing techniques to the training data set of			
	Weather Table			

	processing and analyzing the data.	
7.	Finding Association Rules for Buying data.	
	Description:	
	in data mining, association rule learning is a popular and well	
	variables in large databases. It can be described as analyzing and	
	presenting strong rules discovered in databases using different	
	measures of interestingness. In market basket analysis association	
	rules are used and they are also employed in many application	
	areas including Web usage mining, intrusion detection and	
	bioinformatics.	
8.	Finding Association Rules for Banking data.	
	Description:	
	In data mining, association rule learning is a popular and well	
	researched method for discovering interesting relations between	
	variables in large databases. It can be described as analyzing and	
	presenting strong rules discovered in databases using different	
	rules are used and they are also ampleyed in many application	
	areasincluding Web usage mining intrusion detection and	
	bioinformatics.	
9.	Finding Association Rules for Employee data	
	Description:	
	In data mining, association rule learning is a popular and well	
	researched method for discovering interesting relations between	
	variables in large databases. It can be described as analyzing and	
	presenting strong rules discovered in databases using different	
	measures of interestingness. In market basket analysis association	
	rules are used and they are also employed in many application	
	bioinformatics	
10	To Construct Decision Tree for Weather data and classify it	
10.	Description:	
	Classification & Prediction:	
	Classification is the process for finding a model that describes	
	thedata values and concepts for the purpose of Prediction.	
	Decision Tree:	
	A decision Tree is a classification scheme to generate a tree	
	consisting of root node, internal nodes and external nodes. Root	
	nodes representing the attributes. Internal nodes are also the	
	autoutes. External nodes are the classes and each branch represents	
	Decision Tree also contains set of rules for a given data set.	
	2 cension area uso contains set of fuies for a given data set,	

there are two subsets in Decision Tree. One is a Training dataset	
and second one is a Testing data set. Training data set is previously	
classified data. Testing data set is newly generated data.	
11 To Construct Decision Tree for Customer data and classify it	
Description	
Classification & Prediction:	
Classification is the process for finding a model that describes	
the date values and concents for the nurness of Prediction	
Desigion Trees	
A desigion Tree is a classification scheme to concrete a tree	
A decision free is a classification scheme to generate a tree	
consisting of root node, internal nodes and external nodes. Root	
nodes representing the attributes. Internal nodes are also the	
attributes. External nodes are the classes and each branch represents	
the values of the attributes	
Decision Tree also contains set of rules for a given data set; there	
are two subsets in Decision Tree. One is a Training dataset and	
second one is a Testing data set. Training data set is previously	
classified data. Testing data set is newly generated data.	
12. To Construct Decision Tree for Location data and classify it.	
Description:	
Classification & Prediction:	
Classification is the process for finding a model that describes	
the data values and concepts for the purpose of Prediction.	
Decision Tree:	
A decision Tree is a classification scheme to generate a tree	
consisting of root node, internal nodes and external nodes. Root	
nodes representing the attributes. Internal nodes are also the	
attributes. External nodes are the classes and each branch represents	
the values of the attributes	
Decision Tree also contains set of rules for a given data set: there	
are two subsets in Decision Tree. One is a Training dataset and	
second one is a Testing data set. Training data set is previously	
classified data Testing data set is newly generated data	
13 Write a procedure for Visualization for Weather Table	
Description:	
This program calculates and has comparisons on the data set	
selection of attributes and methods of manipulations have been	
chosen. The Visualization can be shown in a 2-D representation of	
the information	
14 Write a presedure for Viguelization of Doubing Table	
14. White a procedure for visualization of Banking Table.	

Description:	
This program calculates and has comparisons on the data set	
selection of attributes and methods of manipulations have been	
chosen. The Visualization can be shown in a 2-D representation of	
the information.	
15. Write a procedure for cross-validation using J48 Algorithm for	
weather table.	
Description:	
Cross-validation, sometimes called rotation estimation, is a technique	2
for assessing how the results of a	
statistical analysis will generalize to an independent data set. It is	
mainly used in settings where the goal is prediction, and one wants	
to estimate how accurately a predictive model will perform in	
practice. One round of cross-validation involves partitioning a	
sample of data into complementary subsets, performing the analysis	
on one subset (called the <i>training set</i> ), and validating the analysis	
on the other subset (called the validation set or testing set).	
	1

Course Code	2MCS8
Course Name	Lab-IV 2 Graphic Programming & Tools
Credits	2
Course Outcomes	Upon completion of this course successfully, students would be able to
	<ol> <li>Individually Apply C programming concepts to do the Programing for Computer Graphics.</li> </ol>
	<ul> <li>3. Identify and apply a suitable transformation for a given application.</li> <li>* List of Practical</li> </ul>
	<ol> <li>Write a program to draw a line using Bresenham's line drawing algorithm</li> <li>Write a program to draw a line using DDA line drawing algorithm.</li> <li>Write a program to draw a circle using ARCDDA algorithm.</li> <li>Write a program to draw a rectangle.</li> <li>Write a program to draw a ellipse using ARCDDA algorithm.</li> <li>Write a program to rotate a object about origin.</li> <li>Write a program to rotate a object about any arbitrary point.</li> <li>Write a program to implement 2D Scaling Transformation.</li> <li>Write a program to implement 2D Translation Transformation.</li> </ol>

11. Write a program to implement 3D Translation Transformation.
12. Write a program to move an image (ball) on the screen.
13. Write a program to generate a Cubic Bezier Curve.
14. Write a program to draw a Polygon using Absolute and Relative commands.
15. Write a program to clip user defined area of a screen.
16. Write a program to clip line segment.
17. Write a program to clip polygon.
18. Write a program to demonstrate rotation of point.
19. Write a program to fill area by given pattern.
20. Write a program to fill the closed area using flood fill method.
21. Write a program to fill the closed area using Scan line method.
22. Write a program to draw a line using simple DDA line drawing algorithm.

C	IC
G	IU

Course Nam	e GIC3: Webpage Design Techniques
Units	Contents
Unit I	The Environment and the Tools:
	• Introduction
	• The Internet and the World Wide Web
	• Ways to Access the Internet
	• Types of Websites
	Web Design Tools
	Web Design Roles
Unit II	Web Publishing Fundamentals:
	• Introduction
	Advantages of Web Publishing
	Basic Web Design Principles
	Color as Web Design Tool
	• Writing for the Web
	Web Publishing Issues
Unit III	Planning a Successful Website:
	• Introduction
	The Website Development Planning Process
	• Step 1: Define the Website's Purpose and Audience
	• Step 2: Determine the Websites General Content
	• Step 3: Select the Websites Structure
Reference B	ook: Introductory Web Design by Jennifer T. Campbell, CENGAGE Publication

Course Nat	me	GIC4: Automation with Robotics	
Units	Content	S	

Unit I	<b>FUNDAMENTALS OF ROBOT:</b> Robotics-Philosophical Considerations, Definition and Advantages of Robotics, Laws of Robotics, Motivating Factors for the Introduction of Robotics System to the Industrial World, Robot, History of Robots, Objectives of using Industrial Robots, Advantages and Disadvantages of Robots, Types of Industrial Robots., Robotic Systems, Robot Classifications, Mechanical Design of a Robot, Types of Mechanical Joints, Robot Arms, Robot Hands, Robots Qualities, Robot Specifications, Robots Performance Testing
Unit II	<ul> <li>ROBOTICS OPERATIONS AND CONTROL:</li> <li>Robots Kinematic Control: Robot arm kinematics, Robot arm dynamics, Kinematic chains - The manipulator, Robot control systems, Types of controllers used in robotics, Trajectory Planning and motion control manipulator</li> <li>Conversion of Motion</li> <li>Techniques of Robot Calibration</li> <li>Robot Sensing and Vision</li> <li>Robot Programming Languages</li> </ul>
Unit III	<b>INDUSTRIAL AUTOMATION:</b> General Aspects, Advantages and Limitations of Automation, Applications of Automation, Elements of Automation, Aims of Automation, Mechanization and Automation, Types of Automation, Low Cost Automation, Assembly Automation Equipment - Transfer Devices and Feeders, Flexible Manufacturing System (FMS), Computer Integrated Manufacturing (CIM), Mechatronics and Concurrent Engineering, Computer Aided Process Planning (CAPP) system, Group Technology
Reference	Book: Robotics and Industrial Automation by R. K. Rajput S. CHAND Publication

## Appendix-A

Master of Science (M.Sc. Computer Science ) Full Time Two Years Degree Programme :-

1) A Student shall have to be admitted every year in the respective Institute/ College/University Department for completion of an academic year of this two year Degree program.

2) The M.Sc. Degree shall consist of four semesters i.e. Semester I & II in the first academic year, Semester III & IV in the second academic year.

3) Student has to complete all four Semesters successfully for the award of Degree of Master of Science and fulfill conditions as per Ordinance No. 19.

4) Every Semester of M.Sc. Computer Science Program shall be of at least 90 teaching days in a semester and shall be of at least 180 teaching days in an academic year.

5) The Examinations shall consist of the subjects as indicated in the Scheme of Examinations as per Appendix – 'A1 to A4'.

6) The Semester wise structure of the program is as follows.

**56** Appendix- A1

## Sant Gadge Baba Amravati University Amravati <u>Scheme of Teaching, Learning & Examination leading to the Degree Master of Science (Computer Science)</u> <u>(Two Years- Four Semesters Degree Programme- C.B.C.S)</u>

(M. Sc. Part-I) Semester- I

S. N.		T				Te	aching &	k Lea	rning Sche	eme			Exa	mination	ı & Evalua	ation Sch	eme	•
	Code	Гуре	Subje ct	]	Геас Р W	ching eriod Veek	Per		Credi ts		Durati onOf Exam Hours	Th	neor y	larks Pr	actical	Tota	m Pa g	nimu issin
			Core Subject	L	Т	Р	Total	L / T	Practica l	Total	nours	Theory + MCQ Extern al	Theory Internal	Intern al	Extern al	ı Mar ks	Mar ks	Grad e
1	1MCS1	DSC1	1 Computer System Design	4	-	-	4	4	-	4	3	80	20			10 0	40	Р
2	1MCS2	DSC2	2 Data Structure with OOP	4	-	-	4	4	-	4	3	80	20				40	Р
3	1MCS3	DSC3	3 Data Base Management Technologies	4	-	-	4	4	-	4	3	80	20				40	Р
4	1MCS4	DSC4	4 Computer Network & Wireless Technology	4	-	-	4	4	-	4	3	80	20			10 0	40	Р
			Skill-1															
5	1MCS5	SEC1	4-Advanced Java/ NS2/ tools	-	2	2	4	4	-	4	3	-	-	25	25	50	25	Р
			Elective-1															
6.	1MCS6(1)	DSE1	(1) Discrete Mathematical Structure															
7.	1MCS6(2)	DSE2	(2) Entrepreneurship Development															
8.	1MCS6(3)	DSE3	(3)Research Methodology	4	-	-	4	4	-	4	3	80	20			100	40	Р
9.	1MCS6(4)	DSE4	(4)Management Information System				-	_		-	-							
10.	1MCS6(5)	DSE5	(5)Data Science and Analytics															
			Laboratories															
11	1MCS7	Lab-I	1,2 - Programming(C/C++/Java/ALP)	-	I	4	4	-	2	2	3	-	-	25	25	50	25	Р
12	1MCS8	Lab-II	3-SQL/ DBMS tools, MSsql, My Sql	-	-	4	4	-	2	2	3	-	-	25	25	50	25	Р
		•	Internship															
13	1MCS9		#Internship/Field Work/Work Experience@															
			TOTAL	20	2	10	32											
		Open	Elective(Apendix-5)			_												
14	1MCS10	OE1	Open elective (OE) /GIC/Open skill/MOOC*	-	2	-	2	-	1	1	-			25	25	50	25	Р
			TOTAL	20	4	10	34	24	5	29								
		•	GIC															
		GIC1	User Experience Deign														ļ	<b> </b>
		GIC2	Effective Email Communication															

L: Lecture, T: Tutorial, P: Practical

# Students may complete their Internship/Field Work/Work Experience in First OR Second OR Third Semester of M. Sc. (Computer Science ) according to their convenience; @ denotes Ancillary Credit

Note : Internship /Apprenticeship/Field Work / Work Experience (During vacations of Semester I to Semester III) for duration of minimum 60 hours to maximum 90 hours mandatory to all the students, to be completed during vacations of Semester I to III. This will carry 2 Credits for learning of 60 hours or 3 Credits for learning of 90 hours. Its credits and grades will be reflected in final semester IV credit grade report.

- OEC can be studied during semester I to IV-As per Appendix 5

Appendix- A2

### Sant Gadge Baba Amravati University Amravati <u>Scheme of Teaching, Learning & Examination leading to the Degree Master of Science (Computer Science)</u> <u>(Two Years- Four Semesters Degree Programme- C.B.C.S)</u> (M. Sc. Part-I) Semester- II

S. N.	6 11.4	T				Te	aching &	z Lea	rning Scho	eme	Dungt		Exa Ma	mination	n & Evalua	ation Sch	ieme	
	Code	Туре	subje ct	[	Геас Р W	ching eriod /eek	Per		Credi ts		onOf Exam Hours	Th	neor y	Pr	actical	Tota 1	m Pa g	assin
			Core Subject	L	Т	Р	Total	L / T	Practica l	Total		Theory + MCQ Extern al	Theory Internal	Intern al	Extern al	Mar ks	Mar ks	Grad e
1	2MCS1	DSC1	1 Operating System Algorithms	4	-	-	4	4	-	4	3	80	20			10 0	40	Р
2	2MCS2	DSC2	2 Graphics Application programming	4	-	-	4	4	-	4	3	80	20			10 0	40	Р
3	2MCS3	DSC3	3 Software Engineering	4	-	-	4	4	-	4	3	80	20			10 0	40	Р
4	2MCS4	DSC4	4 Data Mining and Data Warehousing	4	-	-	4	4	-	4	3	80	20			10 0	40	Р
			Skill-2															
5	2MCS5	SEC2	1 -OS (Windows / Android /Linux)	-	2	2	4	4	-	4	3	-	-	25	25	50	25	Р
			Elective-2															
6.	2MCS6(1)	DSE1	(1)Theory of Computation															
7.	2MCS6(2)	DSE2	(2)Computer System Architecture															
8,	2MCS6(3)	DSE3	(3)Enterprise Resource Management	4	-	-	4	4	-	4	3	80	20			100	40	Р
9.	2MCS6(4)	DSE4	(4)Mobile Computing															
10.	2MCS6(5)	DSE5	(5)Compiler Construction															
			Laboratories															
11	2MCS7	Lab-III	3,4 -SE tools/ DM tools	-	-	4	4	-	2	2	3	-	-	25	25	50	25	Р
12	2MCS8	Lab-IV	2- Graphics programming and tools	-	-	4	4	-	2	2	3	-	-	25	25	50	25	Р
			Internship															
13	2MCS9		#Internship/Field Work/Work Experience@															
			TOTAL	20	2	10	32											
		Open H	Elective(Appendix 5)															
14	2MCS10	OE2	Openelective (OE) /GIC/Openskill/MOOC*	-	2	-	2	-	1	1	-			25	25	50	25	Р
			TOTAL	20	4	10	34	24	5	29								
			GIC															
		GIC3	Web Page Design Techniques														L	
		GIC4	Automation With Robotics															

## L: Lecture, T: Tutorial, P: Practical

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Note : Internship /Apprenticeship/Field Work / Work Experience (During vacations of Semester I to Semester III) for duration of minimum 60 hours to maximum 90 hours mandatory to all the students, to be completed during vacations of Semester I to III. This will carry 2 Credits for learning of 60 hours or 3 Credits for learning of 90 hours. Its credits and grades will be reflected in final semester IV credit grade report.

- OEC can be studied during semester I to IV- As per Appendix 5

Appendix A3

## Sant Gadge Baba Amravati University Amravati Scheme of Teaching, Learning & Examination leading to the Degree Master of Science (Computer Science) (Two Years- Four Semesters Degree Programme- C.B.C.S)

(M. Sc. Part-II) Semester- I

S. N.		Т				Те	aching <b>&amp;</b>	k Lea	rning Sche	eme	Dent		Exa	mination	& Evalua	ation Sch	eme	•
	Code	Гуре	ct		Геа Р W	ching eriod Veek	lPer		Credi ts		onOf Exam Hours	Th	N leor y	larks Pr	actical	Tota l	m Pa g	issin
			Core Subject	L	Т	Р	Total	L / T	Practica l	Total		Theory + MCQ Extern al	Theory Internal	Intern al	Extern al	Mar ks	Mar ks	Grad e
1	3MCS1	DSC1	1 Algorithms and Design	4	-	-	4	4	-	4	3	80	20			10 0	40	Р
2	3MCS2	DSC2	2 Web Computing	4	-	-	4	4	-	4	3	80	20			10 0	40	Р
3	3MCS3	DSC3	3 Artificial Intelligence and Machine Learning	4	-	-	4	4	-	4	3	80	20			10 0	40	Р
4	3MCS4	DSC4	4 Distributed Computing	4	-	-	4	4	-	4	3	80	20			10 0	40	Р
		•	Skill-3															
5	3MCS5	SEC3	1 Programming on algorithms and Design	-	2	2	4	4	-	4	3	-	-	25	25	50	25	Р
			Elective-3															
6.	3MCS6(1)	DSE1	(1)Optimization Techniques															
7.	3MCS6(2)	DSE2	(2)Digital Forensics															
8,	3MCS6(3)	DSE3	(3)Software Project Management	4	-	-	4	4	_	4	3	80	20			100	40	Р
9.	3MCS6(4)	DSE4	(4)E-Commerce								-		-					
10.	3MCS6(5)	DSE5	(5)Network Security															
			Laboratories															
11	3MCS7	Lab-V	2 HTM/ JS/ CSS/ .net/ PHP	-	-	4	4	-	2	2	3	-	-	25	25	50	25	Р
12	3MCS8	Lab-VI	3 AI programming. Tools/ Python	-	-	4	4	-	2	2	3	-	-	25	25	50	25	Р
			Internship															
13	3MCS9		#Internship/Field Work/Work Experience@															
			TOTAL	20	2	10	32											
			Open Elective															
14	3MCS10	OE3	Openelective (OE) /GIC/Openskill/MOOC*	-	2	-	2	-	1	1	-			25	25	50	25	Р
			TOTAL	20	4	10	34	24	5	29								
			GIC															
		GIC5																
		GIC6			1										, I		1	i

## L: Lecture, T: Tutorial, P: Practical

# Students may complete their Internship/Field Work/Work Experience in First OR Second OR Third Semester of M. Sc. (Computer Science ) according to their convenience; @ denotes Ancillary Credit Note : Internship /Apprenticeship/Field Work / Work Experience (During vacations of Semester I to Semester III) for duration of minimum 60 hours to maximum 90 hours mandatory to all the

students, to be completed during vacations of Semester I to III. This will carry 2 Credits for learning of 60 hours or 3 Credits for learning of 90 hours. Its credits and grades will be reflected in final semester IV credit grade report.

- OEC can be studied during semester I to IV- As per Appendix 5

# Sant Gadge Baba Amravati University Amravati <u>Scheme of Teaching, Learning & Examination leading to the Degree Master of Science (Computer Science)</u> <u>(Two Years- Four Semesters Degree Programme- C.B.C.S)</u> (M. Sc. Part-II) Semester- II

S. N.	Subject	Тур	Subje			Te	aching &	z Lea	rning Sche	eme	Durati		Exai Nia N	nination <del>xımum</del> larks	& Evalua	ation Sch	eme Mii	nimu
	Code	e	ct		Геа Р W	ching eriod Veek	Per		Credi ts		onOf Exam Hours	Th	eor y	Pra	actical	Tota l	m Pa g	issin
			Core Subject	L	Т	Р	Total	L / T	Practica l	Total		Theory + MCQ Extern al	Theory Internal	Intern al	Extern al	Mar ks	Mar ks	Grad e
1	4MCS1	DSC1	1 Cloud Computing	4	-	-	4	4	-	4	3	80	20			10 0	40	Р
2	4MCS2	DSC2	2 Big Data	4	-	-	4	4	-	4	3	80	20			10 0	40	Р
3	4MCS3	DSC3	3 ES, Internet of Things(IOT)	4	-	-	4	4	-	4	3	80	20			10 0	40	Р
4	4MCS4	DSC4	4 Block Chain Technology	4	-	-	4	4	-	4	3	80	20			10 0	40	Р
			Skill-4															
5	4MCS5	SEC4	Android Programming	-	2	2	4	4	-	4	3	-	-	25	25	50	25	Р
		•	Elective-4															
6.	4MCS6(1)	DSE1	(1)Parallel Computing															
7.	4MCS6(2)	DSE2	(2)Image Processing															
8,	4MCS6(3)	DSE3	(3)Cyber Security	4	_	_	4	4	-	4	3	80	20			100	40	Р
9.	4MCS6(4)	DSE4	(4)OOSE	-			-	-		•	·		-•			100		-
10.	4MCS6(5)	DSE5	(5)Robotics& AI															
			Laboratories															
11	4MCS7	Lab-VII	3,4 – Block Chain / IoT tools	-	-	4	4	-	2	2	3	-	-	25	25	50	25	Р
12	4MCS8	Lab-VIII	1,2 - Cloud Computing and Big Data	-	-	4	4	-	2	2	3	-	-	25	25	50	25	Р
13	4MCS9		Seminar	2				1		1				25	25	50	25	Р
14	4MCS10		Project			4			2	2				50	50	10 0	50	Р
		1	Internship															
15	4MCS11		#Internship/Field Work/Work Experience@															
			TOTAL	22	2	14	38	25	6	31								
			Open Elective															
16	4MCS12	OE4	Openelective (OE) /GIC/Openskill/MOOC*	-	2	-	2	-	1	1	-			25	25	50	25	Р
<u> </u>			TOTAL	22			40	25	7	32							ļ	<b></b>
		CICZ	GIC															

L: Lecture, T: Tutorial, P: Practical

# Students may complete their Internship/Field Work/Work Experience in First OR Second OR Third Semester of M. Sc. (Computer Science ) according to their convenience; @ denotes Ancillary Credit

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  - OEC can be studied during semester I to IV-As per Appendix 5

**Total Credits: 119** 

#### Appendix- 5

Common Instructions for all the Semesters regarding Choice Baked Credits (CBC)/Open Electives (OE) are as under:

The titles of broad activity those can be undertaken by the students in every semester and their respective credits are listed in the table given below. Student has to undertake one or more activitiesout of these table so as to avail at least 2 credits per semester

The Subjects/Modules Activity to be undertaken by the Student under the Open Electives approved by the Department Institute. The schedule of approval will be declared by the Department/Institute at the beginning of the Semester (1 July) as per details given below:

One Faculty Member will work as a Coordinator for Open Electives for which 01 Hour of Theory period will be considered as a weekly work load against this work. All Coordinators has to do counselling of respective Open electives, do the Students Registration process and allot them to faculty members (will be working as a mentor). All these electives are internally accessed by respective Coordinators & Guides based on Minimum 03 Class Tests/ Final Objective Test/ Demo/ Report Submission/Certificate issued by competent authority Viva Voce and other methods asdecided by the Department/Institute.

The Mentor shall conduct Tutorial Classes for Workload counting purpose, it should be noted that: 01 Tutorial hour is equal to 01 Theory Hour. For Tutorial, Batch of Maximum 20 Students will beconsidered and the Tutorial Batch should not be comprised of Less than 04 Students.

Coordinator shall take care that the students are not repetitively opting for same type of Electives in every Semester.

## Summary of conduction of Choice Based Credits (CBC)/Open Electives (OC) Electives for all Semesters

- i. Electives Selection Process starts at beginning of the Semester,
- ii. Declare the names of Coordinator for Open Electives.
- iii. Counselling of Students by Coordinators for selection of Open Electives
- iv. Registration of Students by Coordinators under respective Open Electives
- v. Allotment of Registered Students to Mentor from Department.
- vi. Guidance/Counselling to Students by Mentor throughout the Semester
- vii. General Counselling by Coordinators over the Semester, whenever required.
- viii. Final Assessment of Students by Coordinators & Mentor for Allotment of Final Credits
- ix. Submission of Credits gained by Students to the Head of Department from Coordinators

The Open Elective and Credit Assigned	Credit
Successful completion of Online Course of 4 weeks	4
Project activity	4
Seminar Activity	1
Paper/poster presentation	1
Completion of soft skill programme of one week	1
Internship of 30 Hrs	2
Field Visit of 15 Hrs	1
Startup recognized and approved by the department	2

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Participation in Unnat Bharat Abhiyan	1 for 15da maximur
Yoga Meditation camp of 1 week	1
Completion of course/activity of similar credits proposed by the department from among theavailable courses/activities from other department/faculty in the college/university	4