NEHRU ARTS AND SCIENCE COLLEGE

(AUTONOMOUS)

(Affiliated to Bharathiar University Accredited with "A+" Grade by NAAC,
ISO 9001:2015 (QMS) Certified, Recognized by UGC with 2(f) &12(B),
Under Star College Scheme by DBT, Govt. of India)
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REGULATIONS, CURRICULUM & SYLLABUS

B.Sc. COMPUTER SCIENCE (DATA SCIENCE)

Effective from 2023-2024

REGULATIONS

NEHRU ARTS AND SCIENCE COLLEGE

(AUTONOMOUS)

REGULATIONS FOR UNDERGRADUATE DEGREE COURSES

Choice Based Credit System blended with Outcome Based Education

Regulations with effect from the Academic Year 2023-2024

Definition

a) Programme – A course of study leading to the award of a degree in a discipline.
(E.g.: B. Sc. / B. Com.)

b) Branch – Discipline of study (e.g. B.Sc. Computer Science)

c) Curriculum – The various courses (subjects) a student must study in a particular branch.

d) Course – The Theory & Practical subject offered under each curriculum.

e) Credit – A unit of measurement based on the duration of the contact hours, content and quality of the subject matter.

1. UG Curriculum

The UG Curriculum follows CBCS pattern and the medium of instruction is English.

2. Eligibility for Admission to the Course

Candidates for admission to the first year of the UG degree programmes are required to **have passed the higher secondary examination** (Academic or Vocational) conducted by the Govt. of Tamil Nadu in the relevant subjects or other examinations accepted as equivalent thereto by the Parent University, subject to such other conditions as may be prescribed thereof.

3. Duration of the Programme

The UG programme will comprise six semesters with two semesters per academic year, extending over a total duration of three years. Examination shall be conducted at the end of every semester for the respective courses. Each semester has 90 instructional days consisting of 5 teaching hours per working day. Thus, each semester has 450 teaching hours and the whole programme has 2700 teaching hours.

4. Choice Based Credit System (CBCS)

All Undergraduate Programmes offered by the University shall be under Choice Based Credit System (CBCS). Choice based credit system is introduced with the aim of offering flexibility in the choice of courses to the students.

Objectives of the Choice Based Credit System

- To facilitate the students to have greater flexibility in their choice of courses.
- To widen the spectrum of knowledge of students by means of Core, Allied, Project / Electives, Value Education, Environmental Studies and Skill Based Subjects.
- To revamp the curriculum which enables to impart entrepreneurial skills and placement potentials qualities.
- To incorporate need based knowledge in tune with the location and neighborhood of the Institution.
- To allocate credit points to each paper of the study based on the weightage of the contact hours, content and quality.
- To extend opportunities to fast learners in order to earn additional credit from advanced as well as additional courses.
- To maintain the total credit points of each programme on par with international standards.

5. Outcome Based Education (OBE)

OBE is an **educational** theory that bases each part of an **educational** system around goals (**outcomes**). By the end of the **educational** experience, each student should have achieved the goal.

Objectives of Outcome based curriculum

- The programme outcomes and Programme specific outcomes are clearly identified and unambiguously specified regarding the content, context and competence.
- The expected outcome should be defined by setting bench marks for each level of the programme. Benchmark should tackle and define specifically, the goals of the curriculum and verify ways to access whether the students have reached these goals at the level of study;
- OBE is driven by assessments that focus on well defined learning outcomes and not by other factors such as what is taught, the duration taken by the student to achieve the outcomes or which path the students take to achieve their targets. In OBE, assessment techniques must be with clear description of expected performance.

Definitions

Outcome: An outcome of an educational Programme is what the student should be able to do at the end of a Programme / Course / Instructional Unit.

Levels of Outcomes

- **Programme Outcomes:** POs are statements that describe what the students graduating from any of the educational Programmes should be able to do.
- **Programme Specific Outcomes:** PSOs are statements that describe what the graduates of a specific educational Programme should be able to do.
- **Course Outcomes:** COs are statements that describe what students should be able to do at the end of a course

Learning Outcomes: It describes levels of achievement that can be attained across the domains of learning. Here **K1** representing Remember; K2 – Understanding; **K3** – Apply; **K4** – Analyze; **K5** – Evaluate, **K6** – Create are used to measure the levels of achievement in learning.

6. Course of Study

The Course of Study for the UG degree courses of all branches shall consist of the following:

6.1. Part I : Language : Tamil or any one of the modern / Classical languages i.e. Malayalam, French and Hindi.

It is absolutely obligatory for all the UG students to study a language under part I. A student can select and study any one of the languages offered under part I. The syllabus drafted would enable the students to communicate with the ease and effectiveness in that language. It shall be offered during the Semesters I to IV with one examination at the end of each semester.

6.2. Part II : Language : English

The study of English has been made mandatory for all UG students under part II. English being the window to the outer world in the context of the globalization scenario, the contents of the syllabus is tailored in a fashion suitable for imparting the classical and the modern facets of the language and literature, besides conferring a mastery of fluency and command over the language, providing a clout to compete for employment opportunities. The subject shall be offered during the Semesters I to IV with one examination at the end of each semester.

6.3. Part III : Core Subjects, Allied Subjects and Project or Elective Courses:

1) Core Subjects : Each programme has a group of Core courses arranged semester wise. The syllabi of the core courses will enlighten the students in the acquisition of the basic concepts of their respective disciplines, besides getting focused on to the recent trends. The core courses will span over six semesters and examination shall be conducted in the core subjects at the end of every semester.

2) Allied Subjects : In all disciplines, the UG students must study Allied courses along with the core courses, which would supplement, suit and support the major course of study. The Allied Subjects is to be studied during the first four semesters of the UG programmes and examination shall be conducted at the end of every semester.

3) Project , Internships and Electives with three Courses : In all disciplines, the UG student shall undergo a Project and Internships (if any) and he / she must study three Elective Courses.

Three Elective courses are to be offered one in the V semester and two in the VI Semester. Elective subjects are to be selected from the list of electives prescribed by the concerned Board of Studies during the fifth and Sixth Semester along with the Core Subjects.

A student shall take up a project work in addition to his elective subjects. The report of the study should be submitted at the end of course duly certified by the supervisor and forwarded by the Head of the Department / Principal of the College. The Head of the Department of the programme concerned shall assign a project supervisor, who in turn shall assign the topic and monitor the project work of the student.

A student shall complete Internship (if any) as per the recommendations of BoS concerned.

6.4. Part IV

1. a) Those who have not studied Tamil up to XII std and taken a Non-Tamil language under Part-I shall take Tamil Comprising of two Courses. The course content of which shall be equivalent to that prescribed for the 6^{th} Standard by the Board of Secondary Education and they shall be offered in the third and fourth semesters.

b) Those who have studied Tamil up to XII std and taken a Non-Tamil language under Part-I shall take Advanced Tamil comprising of two Courses in the third and fourth semesters.

(OR)

c) Others who do not come under the above a + b categories can choose the following Non-major electives (NME) comprising of two courses with 2 credits each (4 credits) in the **third and fourth semesters**.

1) Consumer Affairs / Gender Sensitization / Women's Rights (**III semester**.)
2) General Awareness (**IV semester**.)

Note: The assessment for the category in Part IV – 1 b and 1 c subjects shall be through End Semester examination (ESE) for the total marks prescribed. There shall be no Continuous Internal Assessment (CIA).

2. **Skill Based Subjects :** For UG degree, four skill based subjects are to be offered one each in III, IV, V and VI Semesters based on the skill based courses recommended in Naan Muthalvan scheme of Govt. of Tamilnadu. The examination shall be conducted in the skill based subjects at the end of the semesters where they are offered.

3. **Ability Enhancement Compulsory Course – Human Rights and Constitution of India:** It is a course to impart the knowledge about the basic Human rights, Classification of human rights, Human Rights Commission and Constitution of India. The total mark is 50 for 2 credits. One Internal Examination shall be conducted for 25 marks in the II semester during CIA III and there is no ESE. The learning outcomes are further measured by various assessment criteria for 25 marks by the course teacher concerned.

4. **Ability Enhancement Compulsory Course – Environmental Studies :** It is a course on Environmental Science which underlines the importance of environment apart from sensitizing students to the dimensions of Environmental problems. The total mark is 50 for 2 credits. One Internal Examination shall be conducted for 25 marks in I semester during CIA III and there is no ESE. The learning outcomes are further measured by various assessment criteria for 25 marks by the course teacher concerned.

5. **Human Values and Yoga Practice:** It is a course to inculcate human values among students to develop physical, mental, social and spiritual health which will enhance personality of the students and also improve the institutional climate in the campus. Human Values and Yoga Practice is offered during Semesters I and II with one hour of Yoga and one hour of Human values to be handled alternatively in a week. This course carries a total of 50 marks comprising 25 marks of Internal Practical Assessment for Yoga and 25 marks of written Examination for Human values during CIA III of Semester II.

6. **Skill Based Open Elective Courses** (**Extra Departmental Courses):** Any student studying any programme can do course except the course offered by his / her Department. All the UG programmes shall offer two skill based courses as **Extra department Courses,** during semester III with 2 credits each. The students can choose one among the courses offered by other departments. The examination will be conducted at the end of the semester. There shall be no continuous Internal Assessment (CIA).

7. **Value Based Open Elective Courses (Intra School Courses) :** During Semester IV, list of Open Elective Courses are offered to Students. These Courses are value based and help to inculcate the values and positive attitude among the Students. Each School will offer a list of courses and the Students shall choose any one open Elective Course they prefer and appear for the Examination to earn 2 mandatory credits. The examination will be conducted at the end of the Semester. There shall be no continuous Internal Assessment (CIA). However the NCC Cadets will appear for theory paper in NCC to earn these credits.

6.5. Part V : Extension Activities : Every student shall participate compulsorily for period of not less than two years (4 semesters) in any one of the programmes. **(NSS / Sports and Games / YRC / RRC)**

Each student must choose any one of the courses offered during the first four semesters. The object of the slot is to build- up the ethics, awareness and involvement in social service, acquisition of knowledge and training in discipline leading to national integration and patriotism, and feeling fit and fine through participation in games and athletics.

The student's performance shall be examined by the staff in-charge of extension activities along with the Head of the respective departments and a senior member of the Department on the following parameters.

- 20% of marks for Regularity of attendance
- 60% of marks for Active Participation in classes / camps / games / special camps / programmes in the College / District / State / University activities.
- 10% of marks for Exemplary Awards / Certificates / Prizes.
- 10% of marks for other Social components such as Blood Donations, Fine Arts, etc.

The grades will be awarded at the end of the Fourth Semester. The mark sheet shall carry the gradation relevant to the marks awarded to the candidates. The marks shall be sent to the Controller of Examinations before the commencement of the final semester examinations.

Table 1 : Grades for Extension Activity

Range of Marks	Grade Point	Letter Grade	Description
90 – 100	9.0 – 10.0	O	OUTSTANDING
80 – 89	8.0 – 8.9	D+	EXCELLENT
75 – 79	7.5 – 7.9	D	DISTINCTION
70 – 74	7.0 – 7.4	A+	VERY GOOD
60 – 69	6.0 – 6.9	A	GOOD
50 – 59	5.0 – 5.9	B	AVERAGE
40-49	4.0-4.9	C	SATISFACTORY
00-39	0.0	U	RE-APPEAR
ABSENT	0.0	AAA	ABSENT

This grading shall be incorporated in the mark sheet to be issued at the end of the semester. (Handicapped students who are unable to participate in any of the above activities shall be required to take a test in the theoretical aspects of any one of the above fields and be graded and certified accordingly)

7. Additional Credit Course

Students are given the opportunity to undertake optional papers, additional to their compulsory papers, in order to gain additional credit that would boost their grades. These are not mandatory. Students can earn to a maximum of 10 credits.

Table 2: Regulations for Additional Credits

S. No.	Subject	Credit / course	Total credits
1	Presentation / Publication of Research papers in International Conferences / Journals.	1	1
2	Completion of Diploma / Certificate Courses	1	1
3	Self Study Papers	1	2
4	MOOC Courses prescribed by the Departments	1	2
5	Achievements - Sports / Social Activities / Co curricular / Extracurricular Activities at University / District / State / National / International levels	1	1
6	Swachh Bharath Summer Internship Programme	2	2
7	Visits Abroad for Participation in International Academic events	1	1
		Total	**10**

Rules: The Students can earn additional credits only if they complete the above during the course period (II to V Sem.) and based on the following criteria. Proof of Completion must be submitted to the Office of Controller of Examinations to award additional credits.

1. Students can earn an additional credit if they present / publish research papers in International conferences / reputed Journals
2. Students can complete Diploma / Certificate Courses for a minimum of 30 hrs (II to V Sem. only) from reputed centres and the same certificate shall be produced to earn a credit. They shall be guided by the Department if needed.
3. Students can earn one credit, if they complete One Self Study Paper prescribed by the Department. The Departments shall offer two Self Study Papers.
4. Students can earn one Credit, if they complete any one MOOC courses prescribed by the Department. Students shall earn a maximum of 2 Additional Credits by completing 2 online courses.
5. Award Winners in Sports / Social Activities / Co curricular / Extra Curricular Activities at University / District / State / National / International levels can earn one Extra Credit by producing the Certificate.
6. As per the direction of Ministry of Human Resource Development, Swachh Bharath Summer Internship Programmme is introduced to the students as an optional paper. Students interested to join the internship programme are required to register and report the activities conducted during the internship period on the website https://sbsi.mygov.in. They shall gain 2 credits if they produce Swachh Bharath Internship Certificate provided by MHRD on completion of their internship.
7. **Extra Credit for NCC Cadets** : NCC Cadets shall gain Extra credits as mandated by UGC and Bharathiar University apart from 2 credits to be added for Part V-Extension Activity during Semester VI. The regulations for the Extra credits shall be communicated to the Cadets through the NCC Officer of the College.

Regulations for Awarding credits to NCC Cadets

Semester	Credits Allocated		Remarks
	Camp	Theory	
III	2		Credits if 1st camp merged with 3rd Semester
IV		2	Under Value based Open Elective course (Mandatory credit)
V	2		Credits if 2nd camp merged with 5th Semester
Total	**6 credits**		

8. Value Added Course

Each Department shall conduct a Value Added Course to their students during III and IV Semesters for 50 to 60 hours. The MoU with the Industry shall be signed and the Classes shall be conducted without affecting the regular class hours. The Examination and the Valuation shall be conducted by the Industry. The HoD of concerned department shall forward the marks to the Examination section during the end of IV semester and the Grade shall be awarded by the CoE. This is based on the Naan Muthalvan scheme of Govt. of Tamilnadu.

9. Scheme of Examination

Table 3: Summary: CBCS for Undergraduate programmes with language for Four Semesters

Components of Study	No. of Subjects	Credit per Subject #	Total Credits	Marks	Total Marks
Part-I: Tamil / Other Languages	2 + 2 = 4	3	12	75	300
Part-II : English	2 + 2 = 4	3	12	75	300
Part-III					
Core subjects	14 -18	2/ 3 / 4	64-66	50 / 75 / 100	2300
Allied subjects	4 – 6	2/ 3 / 4	14 -16	50 / 75 / 100	
Electives	3	4	12	100	
Part-IV 1. (a) Those who have not studied Tamil up to XII std. and taken a non-Tamil language under part-I shall take basic Tamil comprising of two courses(level will be at 6th std.) (b) Those who have studied Tamil up to XII std and taken a non –Tamil language under part-I shall take Advance Tamil comprising of two courses. I others who do not come under a + b can choose non-major elective comprising of two courses.(NME)	2	2	4	50	100
2. Skill based subjects	4	3	12	75	300
3. Human Rights and Constitution of India	1	2	2	50	50
4. Environmental Studies	1	2	2	50	50
5. Human Values and Yoga Practice	1	2	2	50	50

6. Value Added Course	1	-	-	-	Grade
7. EDC (Extra Departmental Course)	1	2	2	50	50
8.Open Elective Courses	1	2	2	50	50
Part V: Extension activities	1	2	2	50	50
		Total	**144**		**3600**
Additional Credits	II – V Semesters			10 credits	

- No CIA marks for Additional Credit
- No CIA Tests or ESE for Extension Activities.
- For Value added course, Examination shall be conducted by the Industry for 100 marks for a duration of 3 hours.

10. Requirement to appear for the Examinations

Attendance Requirements for the Students appearing for ESE

- The guidelines of attendance requirement issued by Bharathiar University are adopted by the College. Attendance shall be considered semester- wise (not annually).
- A candidate shall be permitted to appear for the Semester Examinations in any semester, if he / she secures not less than 75% of attendance in the total number of working days during the semester and if his / her progress has been satisfactory, and his / her conduct has been satisfactory.
- Those who have obtained below 75% and above 65% of attendance shall pay condonation fee and shall write the examination in the same semester with due permission from the Principal.
- Those who have below 65% and above 50% of attendance are not eligible to write the examination in current semester subjects but are permitted to continue their studies in the next semester provided that this is the first time that the candidate earned attendance between 50% and 65%. Else the candidates have to discontinue the course and re-join in the same semester subjects in the next year with proper approval of the Principal. However, the candidates are eligible to write arrear subjects if any.
- Those who have below 50% of attendance have to redo the semester.

11. Restrictions to appear for the examinations

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

b) Candidates who fail in any of the course of Part I, II, III, IV & V of UG degree examinations shall complete the course concerned **within 5 years** from the date of admission to the said programme, and if they fail to do so, they shall take the examination in the texts / revised syllabus prescribed for the immediate next batch of candidates. If there is no change in the texts / syllabus they shall appear for the examination in that course with the syllabus in vogue until there is a change in the texts or syllabus. In the event of removal of that course consequent to change of regulation and / or curriculum after 5 year period, the candidates shall have to take up an equivalent course in the revised syllabus as suggested by the Chairman of the concerned board of studies and fulfill the requirements as per the regulations for the award of the degree.

12. Medium of Instruction and Examinations

The Medium of instruction and Examinations for the courses of Part I, II & IV shall be in the language concerned. For part III courses, the medium of instruction and the medium of Examination are English.

13. Distribution of Marks

The following are the distribution of marks for Examination & Evaluation pattern:

Table 4 : Distribution of Marks between End Semester Exam (Theory) and Internal Assessment is 75 : 25

Total Marks	External		Internal	Overall Passing Minimum for Total Marks (Internal + External)
	Max. Marks	Passing Minimum for External alone	Max. Marks	
100	75	30	25	40
75	55	22	20	30
50	40	16	10	20

Table 5 : The following are the Distribution of marks for the Continuous Internal Assessment in the theory papers of UG programmes

S. No.	For Theory - UG courses	Distribution of Marks		
01.	CIA I	5	4	2
02.	CIA II (Online Test)	5	4	2
03.	CIA III	6	5	4
04.	OBE Evaluation – Tool 01	3	2	1
05.	OBE Evaluation – Tool 02	3	2	1
06.	OBE Evaluation – Tool 03	3	3	-
	TOTAL MARKS	**25**	**20**	**10**

14. Continuous Internal Assessment (CIA)

Three CIA's shall be conducted at regular Intervals. CIA I shall be a 2 hours written test for a maximum of 50 marks and CIA II shall be conducted as Computer Based test (MCQ's) for 50 marks. CIA III shall be conducted as Model Examination for ESE.

15. OBE Evaluation - Assignment / Seminar / Role play, etc.

Three OBE Assessment parameters are decided for each course to evaluate the achievement of course outcomes which shall be assessed by the concerned course teacher. The marks allotted to this component will be awarded based on the performance of the candidate. The Rubrics for awarding the marks shall be maintained by the Course Teacher concerned.

Table 6 : Distribution of Marks between End Semester Exam (Practical) and Internal Assessment is 60:40.

Total Marks	External		Internal	Overall Passing Minimum for total marks (Internal + External)
	Max. Marks	Passing Minimum for External alone	Max. Marks	
100	60	24	40	40
75	45	18	30	30
50	30	12	20	20

Table 7 : Distribution of marks for the Continuous Internal Assessment in UG practical courses

S. No.	For - UG practical Courses	Distribution of Marks		
01.	Laboratory Performance - Assessment Tool 01*	5	4	3
02.	Laboratory Performance - Assessment Tool 02*	5	4	3
03.	Laboratory Performance - Assessment Tool 03*	5	4	3
04.	Test 1 : During Mid semester	10	7	4
05.	Test 2 : As model test at the end of the semester	10	7	4
06.	Observation Note Book	5	4	3
Total Marks		**40**	**30**	**20**

*** For measuring the Course Outcomes**

16. Observation Notebook & Regularity

The marks allotted for observation notebook & regularity are awarded based on the performance of students in writing procedure, results of the practical done during every practical class, regularity in attending practical class, which will be accounted based on the attendance maintained separately for practical class, and punctuality in the submission of observation notebook.

Table 8 : Distribution of marks for the External Assessment in UG Practical courses

S. No.	For - UG practical courses	Distribution of Marks		
1.	Experiment – I	20	15	10
2.	Experiment – II	20	15	10
3.	Record	10	10	5
4.	Viva Voce	10	5	5
	TOTAL MARKS	**60**	**45**	**30**

Table 9 : Distribution of marks for Project and Viva Voce examinations / Industrial Training of UG programmes

Total Marks	External		Internal	Overall Passing Minimum for Total Marks (Internal + External)
	Max. Marks	Passing Minimum for External alone	Max. Marks	
100	60	24	40	40
75	45	18	30	30

Table 10 : Distribution of marks for the Continuous Internal Assessment in UG Project / Industrial Training Courses.

S. No.	For - UG Project courses / Industrial Training	Distribution of Marks	
1.	Review – I	10	7
2.	Review – II	10	7
3.	Review – III	10	7
4.	Document, Preparation and Implementation	10	9
	TOTAL MARKS	**40**	**30**

Table 11 : Distribution of marks for the External Examination in UG Project / Industrial Training courses

S. No.	For - UG Project / Industrial Training courses	Distribution of Marks	
1.	Record Work and Presentation	40	30
2.	Viva Voce	20	15
	TOTAL MARKS	**60**	**45**

Table 12 : The courses which have only Continuous Internal Assessment and no End Semester Examinations (ESE)

S. No.	Subject	Total Marks
1.	Environmental Studies	50
2.	Human Rights and Constitution of India	50
3.	Basic Tamil I	50
4.	Basic Tamil II	50
5.	Human Values and Yoga Practice	50
	TOTAL	**250**

For the above mentioned subjects, the examinations shall be only Continuous Internal Assessment (CIA) as prescribed in the syllabus. The marks shall be furnished to the CoE.

Table 13 : The courses which have only End Semester Examinations (ESE) and no Continuous Internal Assessment

S. No.	Subject	Total Marks
1.	Non – Major Electives / Advanced Tamil I	50
2.	General Awareness / Advanced Tamil II	50
3.	Skill Based Open Elective Courses	50
4.	Value Based Open Elective Courses	50
	TOTAL	**200**

17. Passing Minimum

A candidate who secures **not less than 40%** in the End Semester Examination and 40% marks in the External Examination and Continuous Internal Assessment put together in any theory course of Part I, II, III & IV shall be declared to have passed the examination in the subject (Theory and Practical). Thus the minimum pass mark for theory subject is 30 out of 75 in ESE and also 40 marks out of 100 (CIA+ESE).

A candidate who passes the examination in all the courses of Part I, II, III, and IV & V shall be declared to have passed, the whole examination. Thus to obtain UG degree a student should pass in all the courses prescribed in the concerned programme and also he / she should earn 144 credits.

18. Marks & Grade

Once the marks of the CIA and End Semester Examinations for each of the course are available, they shall be added. The mark thus obtained shall then be converted to the relevant letter grade as per the details given below to indicate the performance of the candidate.

Table 14 : Conversion of Marks to Grade Points & Letter Grade(Performance in a course / paper)

Range of Marks	Grade Point	Letter Grade	Description
90-100	9.0-10.0	O	Outstanding
80-89	8.0-8.9	D+	Excellent
75-79	7.5-7.9	D	Distinction

70-74	7.0-7.4	A+	Very Good
60-69	6.0-6.9	A	Good
50-59	5.0-5.9	B	Average
40-49	4.0-4.9	C	Satisfactory
00-39	0.0	U	Re-Appear
ABSENT	0.0	AAA	Absent

19. Grade Point Average (GPA)

Grade point average (GPA) is calculated for each part taking into account all the courses studied under each part. Calculation of grade point average semester-wise and part-wise is as follows:

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

$$\textbf{GPA} = \frac{\sum_i (C_i * G_i)}{\sum_i C_i}$$

Where C_i = Credit earned for course i in any semester.

G_i = Grade points obtained for course i in any semester.

20. Cumulative Grade Point Average (CGPA)

For the entire program CGPA is calculated in the following manner:

$$\textbf{CGPA} = \frac{\sum_n \sum_i C_{ni} * G_{ni}}{\sum_n \sum_i C_{ni}}$$

$$\text{CGPA} = \frac{\text{Sum of the multiplication of grade points by the credits of the entire programme under each part}}{\text{Sum of the Credits of the Courses of the entire programme under each part}}$$

21. Classification of CGPA

A candidate who has passed all the examinations under different parts (Part-I to Part V) is eligible for the following part wise computed final grades based on the range of CGPA.

Table 15 : Classification of performance of Students based on the Cumulative Grade Points Average

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

A candidate who passes all the examinations in Part I to Part V securing following CGPA and Grades shall be declared as follows **for Part I or Part II or Part III**:

a) A candidate who has passed all the Part-III subjects examination in the first appearance within the prescribed duration of the UG programmes and secured a CGPA of 9 to 10 and equivalent grades "O" or "O+" in part III comprising Core, Electives and Allied subjects shall be placed in the category of "**First Class – Exemplary**".

b) A candidate who has passed all the Part-III subjects examination in the first appearance within the prescribed duration of the UG programmes and secured a CGPA of 7.5 to 9 and equivalent grades "D" or "D+" or "D++" in part III comprising Core, Electives and Allied subjects shall be placed in the category of "**First Class with Distinction**".

c) A candidate who has passed all Part-III subjects examination of the UG programmes and secured a CGPA of 6 to 7.5 and equivalent grades "A" or "A+" or "A++" shall be declared to have passed that part in "**First Class**".

d) A candidate who has passed all Part-I or Part-II subjects examination of the UG programmes and secured a CGPA of 6 and above and equivalent grades "A" or "A+" or "A++" shall be declared to have passed that parts in "**First Class**".

e) A candidate who has passed all the Part-I or Part-II or Part-III subjects examination of the UG programmes and secured a CGPA of 5.0 to 6 and equivalent grades "B" or "B+" shall be declared to have passed that parts in "**Second Class**".

f) A candidate who has passed all the Part-I or Part-II or Part-III subjects examination of the UG programmes and secured a CGPA of 4.0 to 5 and equivalent grades "C" or "C+" shall be declared to have passed that parts in "**Third Class**".

g) There shall be no classifications of final results for Part IV and Part V. However, those parts shall be awarded with final grades in the End semester statements of marks and in the Consolidated statement of marks.

22. Improvement of Marks in the subjects already passed

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

23. Conferment of the Degree

No candidate shall be eligible for conferment of the Degree unless he / she

i. Has undergone the prescribed course of study for a period of not less than six semesters in an institution approved by / affiliated to the University or has been exempted from in the manner prescribed and has passed the examinations as have been prescribed therefore.

ii. Has completed all the components prescribed under Parts I to Part V in the CBCS pattern to earn 144 credits.

iii. Has successfully completed the prescribed Field Work/ Institutional Training (if any) as evidenced by certificate issued by the concerned authorities.

24. Ranking

A candidate who qualifies for the UG degree course passing all the examinations in the first attempt, within the minimum period prescribed for the course of study from the date of admission to the course and secures I or II class shall be eligible for ranking and such ranking shall be confined to 10 % of the total number of candidates qualified in that particular branch of study or maximum of Three Ranks whichever is lower. However the Programmes will be considered for ranking only when there are minimum of 10 students completing that Programme. The improved marks shall not be taken into consideration for ranking.

25. Question Paper Pattern

The question paper pattern for CBCS pattern syllabi for the candidates admitted from the Academic year 2023-24 are as follows:

A. Question Paper Pattern for Part I / Part II / Core / Allied / Elective / Skill Based Subjects

Time : 3hrs **Marks : 75**

Knowledge Level		Section	Marks	Description
K1, K2, K3	1– 10	A(Answer all the questions)	10 x 1 = 10	MCQ
K2, K3	11 – 15	B (Either or pattern)	5 x 5 = 25	Short Answers
K3, K4	16 – 21	C (Answer 3 out of 6)	3 x 10 = 30	Descriptive/ Detailed
K3, K4	22	D (Compulsory Question)	1 x 10 = 10	Application Based/ HOTS

B. Question Paper Pattern for Part I / Part II / Core / Allied / Elective / Skill Based Subjects

Time : 3hrs **Marks : 55**

Knowledge Level		Section	Marks	Description
K1, K2, K3	1– 10	A(Answer all the questions)	10 x 1 = 10	MCQ
K2, K3	11 – 15	B (Either or pattern)	5 x 4 = 20	Short Answers
K3 , K4	16 – 21	C (Answer 3 out of 6)	3 x 6= 18	Descriptive/ Detailed
K3, K4	22	D (Compulsory Question)	1 x 7 = 7	Application Based/ HOTS

C. Question Paper Pattern –Advanced Tamil , Open Elective Courses and Self Study Papers

Time: 3 Hours **Max Marks: 50**

Knowledge Level		Section	Marks	Description
K2, K3	1 – 10	A (Answer all the questions)	10 x 2 = 20	Short Answers / Define
K3 , K4	11 – 15	B (Either or pattern)	5 x 6 = 30	Descriptive/ Detailed

For self study papers, Open Book Examination will be followed.

D. Question Paper Pattern for Part IV subjects

For Part IV papers like Environmental Studies, Human Rights and Constitution of India, Human Values & Yoga Practice, Examination time shall be **2 hours with maximum of 25 marks**. The pattern shall be 5 out of 10 Questions each carrying 5 marks.

NOTE: The questions should be numbered continuously running through the Sections A, B and C.

Questions should be evenly distributed among the unit in the syllabus in all the sections of the question paper. While framing questions with internal choice, the questions must be identified as (a) or (b).(e.g. 11. a or b). Further, the internal choice must be from the same unit.

ESE for General Awareness shall be conducted online with 100 multiple choice questions (with four options) to be evaluated online. (100 x 0.5 = 50 marks)

For other courses in Part IV of UG programmes namely, **Consumer Affairs, Gender Sensitization, and Women's Rights** the question paper pattern shall be 5 out of 10.

The Controller of the Examinations shall arrange for the setting of question papers on the basis the syllabus and the pattern of question paper duly certified by the Chairpersons of the respective Board of Studies.

26. Syllabus

The syllabus for various courses shall be clearly demarcated into five viable units in each course.

27. Revision of Regulations and Curriculum

The above Regulation and Scheme of Examinations shall be in vogue without any change for a minimum period of three years from the date of approval. The College may revise / amend / change the Regulations and Scheme of Examinations, if found necessary.

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NEHRU ARTS AND SCIENCE COLLEGE

(AUTONOMOUS)

REGULATIONS FOR POSTGRADUATE DEGREE COURSES

Choice Based Credit System blended with Outcome based Education

Regulations with effect from the Academic Year 2022-2023

Definition

a) Programme – A course of study leading to the award of a degree in a discipline. (E.g.: M. Sc. / M. Com.)

b) Branch – Discipline of study (e.g. M.Sc. Microbiology)

c) Curriculum – The various courses (subjects) a student must study in a particular branch.

d) Course – The theory & practical subject offered under each curriculum.

e) Credit – A unit of measurement based on the duration of the contact hours, content and quality of the subject matter.

1. PG Curriculum

The PG Curriculum follows CBCS pattern and the medium of instruction is English.

2. Eligibility for Admission to the Course

A candidate who has passed the Degree Examination as main subject of study of this University or an examination of some other University accepted by the Syndicate as equivalent thereto shall be eligible for admission to the Master Degree of this College.

3. Duration of the Programme

This Course of Study shall be based on Semester System. This Course shall consist of four Semesters covering a total of two Academic years. For this purpose, each academic year shall be divided into two Semesters; the first and third Semesters; July to November and the second and the fourth Semesters; December to April. The Practical Examinations shall be conducted at the end of odd / even Semester. Each semester have 90 working days consists of 5 teaching hours per working day. Thus, each semester has 450 teaching hours and the whole programme has **1800 teaching hours**.

4. Choice Based Credit System (CBCS)

All Postgraduate Programmes offered by the University shall be under Choice Based Credit System (CBCS). Choice based credit system is introduced with the aim of offering flexibility in the choice of courses to the students.

Objectives of the Choice Based Credit System :

- To facilitate the students to have greater flexibility in their choice of courses.
- To revamp the curriculum, to impart entrepreneurial skills and placement potentials qualities.
- To incorporate need based knowledge in tune with the location and neighborhood of the institution.
- To allocate credit points to each paper of the study based on the weightage of the contact hours, content and quality.
- To extend opportunities to fast learners in order to earn Extra credit from advanced as well as additional courses.
- To maintain the total credit points of each programme on par with international standards.

5. Outcome Based Education (OBE)

OBE is an **educational** theory that bases each part of an **educational** system around goals (**outcomes**). By the end of the **educational** experience, each student should have achieved the goal.

Objectives of Outcome based curriculum :

- The programme outcomes and Programme specific outcomes are clearly identified and unambiguously specified regarding the content, context and competence.
- The expected outcome should be defined by setting bench marks for each level of the programme. Benchmark should tackle and define specifically, the goals of the curriculum and verify ways to access whether the students have reached these goals at the level of study;
- OBE is driven by assessments that focus on well defined learning outcomes and not by other factors such as what is taught, the duration taken by the student to achieve the outcomes or which path the students take to achieve their targets. In OBE, assessment techniques must be with clear description of expected performance.

Definitions

Outcome : An outcome of an educational Programme is what the student should be able to do at the end of a Programme/ course/ instructional unit.

Levels of Outcomes

- Programme Outcomes: POs are statements that describe what the students graduating from any of the educational Programmes should be able to do.
- Programme Specific Outcomes: PSOs are statements that describe what the graduates of a specific educational Programme should be able to do.
- Course Outcomes: COs are statements that describe what students should be able to do at the end of a course

Learning Outcomes : It describes levels of achievement that can be attained across the domains of learning. Here **K1** representing Remember; **K2** -Understanding; **K3** - Apply; **K4** - Analyze; **K5**- Evaluate, **K6** – Create are used to measure the levels of achievement in learning.

6. CBCS Curriculum

6.1. Part A : Core Components:

Core Courses : Each programme has a group of core courses. The syllabus of the core courses will facilitate the students in the acquisition of the basic concepts of their respective disciplines, besides getting exposure to the recent developments. This exposure will suitably guide the students towards their vertical mobility in their higher studies. Core courses will last till the fourth semester. **It is mandatory for all PG students to complete an online course under SWAYAM / NPTEL platform between 2nd and 3rd semester.**

6.2. Part B: Optional Courses - Advanced Learner's Courses : (ALC)

Students are offered the opportunity to undertake optional papers, additional to their compulsory papers, in order to gain additional credit that would boost their grades. These are not mandatory. The course will be a self study nature and the concerned departments will offer guidance. Other Advanced Learner's Courses shall be decided during the conduct of Board of Studies. The Examination will be of Open Book Examination model.

7. Requirement to appear for the examinations

Attendance Requirements for the Students appearing for ESE

- The guidelines of attendance requirement issued by Bharathiar University are adopted by the College. Attendance shall be considered semester- wise (not annually).
- A candidate shall be permitted to appear for the Semester Examinations in any semester, if he / she secures not less than 75% of attendance in the total number of working days during the semester and if his / her progress has been satisfactory, and his / her conduct has been satisfactory.

- Those who have obtained below 75% and above 65% of attendance shall pay condonation fee and shall write the examination in the same semester with due permission from the Principal.
- Those who have below 65% and above 50% of attendance are not eligible to write the examination in current semester subjects but are permitted to continue their studies in the next semester provided that this is the first time that the candidate earned attendance between 50% and 65%. Else the candidates have to discontinue the course and re-join in the same semester subjects in the next year with proper approval of the Principal. However, the candidates are eligible to write arrear subjects if any.
- Those who have below 50% of attendance have to redo the semester.

8. Restrictions to appear for the examinations

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

b) Candidates who fail in any of the course of PG degree examinations shall complete the course concerned **within 5 years** from the date of admission to the said programme, and if they fail to do so, they shall take the examination in the texts / revised syllabus prescribed for the immediate next batch of candidates. If there is no change in the texts / syllabus they shall appear for the examination in that course with the syllabus in vogue until there is a change in the texts or syllabus. In the event of removal of that course consequent to change of regulation and / or curriculum after 5 year period, the candidates shall have to take up an equivalent course in the revised syllabus as suggested by the Chairman of the concerned board of studies and fulfill the requirements as per the regulation curriculum for the award of the degree.

9. Medium of Instruction and examinations

The medium of Instruction and the medium of Examination is English.

10. Distribution

The following are the distribution of marks for examination & evaluation pattern. Distribution of Marks between End Semester Exam (Theory) and Internal Assessment is 75:25. The following table gives the distribution.

PG - PROGRAMMES (CBCS)

Table 16: Total credit points and tenure of study for M.A., M.Com, M. Sc. and MSW

Part	Courses	Semesters	Credit Points	Marks / Grade
III	Components Core / Electives / Internship / Project / Online course	I to IV	94	2350

11. Additional Credits

Students are given the opportunity to undertake optional papers, additional to their compulsory papers, in order to gain additional credit that would boost their grades. These are not mandatory. Students can earn to a maximum of 15 credits.

S. No.	Subject	Credit / Course	Total Credits
1.	Presentation of Research papers in International Conferences	1	1
2.	Publication of Research Papers in reputed Journals	1	1
3.	Advanced Learners Course	2	4
4.	MOOC Courses / Swayam prescribed by the Departments	2	4
5.	Visits Abroad for Participation in International Academics events	1	1
6.	Representation - Sports / Social Activities / Co curricular / Extracurricular Activities at University / District / State / National / International levels	1	2
7.	Swachh Bharath Summer Internship Programme	2	2
		Total	**15**

12. Continuous Internal Assessment (CIA)

Three CIA's shall be conducted at regular Intervals. CIA I and II shall be a 2 hours written test for a maximum of 50 marks each and CIA III shall be conducted as Model Examination for ESE.

13. OBE Evaluation - Assignment / Seminar / Role play, etc.

Three OBE Assessment parameters are decided for each course to evaluate the achievement of course outcomes which shall be assessed by the concerned course teacher. The marks allotted to this component will be awarded based on the performance of the candidate. The Rubrics for awarding the marks shall be maintained by the Course Teacher concerned.

14. Distribution of Marks

Table 17 : Distribution of marks for External and Internal for theory papers of PG courses

Total Marks	External		Internal	Overall Passing Minimum for Total Marks (Internal + External)
	Max. Marks	Passing Minimum for External alone	Max. Marks	
100	75	38	25	50
75	55	28	20	38
50	40	20	10	25

Table 18 : Distribution of Internal marks for theory papers of PG courses

S. No.	For Theory - PG courses	Distribution of Marks		
01.	CIA I	5	4	2
02.	CIA II	5	4	2
03.	CIA III	6	5	4
04.	OBE Evaluation – Tool 01	3	2	1
05.	OBE Evaluation – Tool 02	3	2	1
06.	OBE Evaluation – Tool 03	3	3	-
	TOTAL MARKS	**25**	**20**	**10**

Table 19 : Distribution of marks for External and Internal for Practical papers of PG Courses

Total Marks	External		Internal	Overall Passing Minimum for total marks (Internal + External)
	Max. Marks	Passing Minimum for External alone	Max. Marks	
100	60	30	40	50
75	45	23	30	38
50	30	15	20	25

Table 20 : Distribution of Internal marks for PG practical papers

S. No.	For PG Practical Courses	Distribution of Marks		
01.	Laboratory Performance - Assessment Tool 01*	5	4	3
02.	Laboratory Performance - Assessment Tool 02*	5	4	3
03.	Laboratory Performance - Assessment Tool 03*	5	4	3
04.	Test 1 : During Mid semester	10	7	4
05.	Test 2 : As model test at the end of the semester	10	7	4
06.	Observation Note Book	5	4	3
Total Marks		**40**	**30**	**20**

Table 21 : Distribution of External marks for PG practical papers

S. No.	For - UG practical courses	Distribution of Marks		
1.	Experiment-I	20	15	10
2.	Experiment-II	20	15	10
3.	Record	10	10	5
4.	Viva Voce	10	5	5
	TOTAL MARKS	**60**	**45**	**30**

Table 22 : Distribution of marks for Project and Viva Voce examinations and Continuous Internal Assessments and passing minimum marks for the Project / Industrial Training courses of PG programmes

Total Marks	External		Internal	Overall Passing Minimum for Total Marks (Internal + External)
	Max. Marks	Passing Minimum for External alone	Max. Marks	
250	150	75	100	125
200	120	60	80	100
150	90	45	60	75
100	60	30	40	50

Table 23 : Distribution of marks for the Continuous Internal assessment in PG Project / Industrial Training Courses

S. No.	For - PG Project courses	Distribution of Marks			
1.	Review-I	20	15	10	10
2.	Review-II	20	15	10	10
3.	Review-III	20	15	10	10
4.	Document, Preparation and Implementation	25	20	15	10
5.	Research Paper Publication in Journals**	15	15	15	-
	TOTAL MARKS	**100**	**80**	**60**	**40**

**Wherever it is not possible, an equivalent Assessment tool shall be prescribed by the Board Chairperson.

Table 24 : Distribution of marks for the External Examination in PG Project / Industrial Training courses

S. No.	For - PG Project courses	Distribution of Marks			
1.	Record Work and Presentation	100	80	60	40
2.	Viva Voce	50	40	30	20
	TOTAL MARKS	**150**	**120**	**90**	**60**

15. Passing Minimum:

A candidate who secures **not less than 50%** in the End Semester Examination and 50% marks in the External examination and Continuous Internal Assessment put together in any courses shall be declared to have passed the examination in the subject (Theory and Practical). Thus the minimum pass mark is 38 out of 75 in ESE and 50 marks out of 100 (CIA+ESE).

A candidate who passes the examination in all the courses shall be declared to have passed, the whole examination. Thus to obtain PG degree, a student should pass in all the courses prescribed in the concerned programme and also he / she should earn 94 credits.

16. Grade:

Table 25 : Classification of Grade for PG Students based on the Percentage of marks

Range of Marks	Grade Point	Letter Grade	Description
90 – 100	9.0 – 10.0	O	OUTSTANDING
80 – 89	8.0 – 8.9	D+	EXCELLENT
75 – 79	7.5 – 7.9	D	DISTINCTION
70 – 74	7.0 – 7.4	A+	VERY GOOD
60 – 69	6.0 – 6.9	A	GOOD
50 – 59	5.0 – 5.9	B	AVERAGE
00 – 49	0.0	C	RE-APPEAR
ABSENT	0.0	AA	ABSENT

17. Grade Point Average (GPA)

Grade point average (GPA) is calculated for each part taking into account all the courses studied. Calculation of grade point average semester-wise and part-wise is as follows:

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

$$\textbf{GPA} = \frac{\sum_i (C_i * G_i)}{\sum_i C_i}$$

Where C_i = Credit earned for course i in any semester.

G_i = Grade points obtained for course i in any semester.

18. Cumulative Grade Point Average (CGPA)

For the entire program CGPA is calculated in the following manner.

$$\textbf{CGPA} = \frac{\sum_n \sum_i C_{ni} * G_{ni}}{\sum_n \sum_i C_{ni}}$$

$$\text{CGPA} = \frac{\text{Sum of the multiplication of grade points by the credits of the entire programme under each part}}{\text{Sum of the Credits of the Courses of the entire programme under each part}}$$

19. Classification of CGPA

A candidate who has passed all the examinations under different parts is eligible for the following part wise computed final grades based on the range of CGPA.

Table 26 : Classification of performance of PG Students based on the Cumulative Grade Points Average

CGPA	Grade	Classification of Final Result
9.5 – 10.0	O+	First Class – Exemplary *
9.0 and above but below 9.5	O	
8.5 and above but below 9.0	D++	First Class with Distinction*
8.0 and above but below 8.5	D+	
7.5 and above but below 8.0	D	
7.0 and above but below 7.5	A++	First Class
6.5 and above but below 7.0	A+	
6.0 and above but below 6.5	A	
5.5 and above but below 6.0	B+	Second Class
5.0 and above but below 5.5	B	

a) A candidate who has passed all the subjects examinations in the first appearance within the prescribed duration of the PG programmes and secured a CGPA of 9 to 10 and equivalent grades “O” or “O+” in Core and Electives subjects shall be placed in the category of “First Class – Exemplary”.

b) A candidate who has passed all the subjects examinations in the first appearance within the prescribed duration of the PG programmes and secured a CGPA of 7.5 to 9 and equivalent grades “D” or “D+” or “D++” in Core and Electives subjects shall be placed in the category of “First Class with Distinction”.

c) A candidate who has passed all the subjects examinations of the PG programmes and secured a CGPA of 6 to 7.5 and equivalent grades “A” or “A+” or “A++” shall be declared to have passed in “First Class”.

d) A candidate who has passed all the subjects examination of the PG programmes and secured a CGPA of 5.0 to 6 and equivalent grades “B” or “B+” shall be declared to have passed in “Second Class”.

20. Ranking

A candidate who qualifies for the PG Degree programme passing all the Examinations in the first attempt, within the minimum period prescribed for the programme from the date of admission to the programme and secures First or Second Class shall be eligible for ranking and such ranking will be confined to 10% of the total number of candidates qualified in that particular subject to a maximum of 10 ranks. However the Programmes will be considered for ranking only when there are minimum of 10 students completing that Programme. The improved marks will not be taken into consideration for ranking.

21. Improvement of Marks in the subjects already passed

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

22. Conferment of the Degree

No candidate shall be eligible for conferment of the Degree unless he / she has undergone the prescribed programme of Study for a period of not less than four Semesters in the Institution or has been exempted there from in the manner prescribed and has passed the Examinations as have been prescribed.

23. Question Paper Pattern

A: Question Paper Pattern

Time: 3 Hours **Max Marks: 75**

Knowledge Level	Q. No.	Section	Marks	Description
K1, K2, K3	1 – 10	A(Answer all the questions)	10 x 1 = 10	MCQ
K2, K3	11 – 15	B (Either or pattern)	5 x 5 = 25	Short Answers
K3, K4	16 – 21	C (Answer 3 out of 6)	3 x 10 = 30	Descriptive/ Detailed
K4, K5	22	D (Compulsory Question)	1 x 10= 10	Application Based/ HOTS

B. Question Paper Pattern

Time: 3 Hours **Max Marks: 55**

Knowledge Level	Q. No.	Section	Marks	Description
K1, K2, K3	1 – 10	A(Answer all the questions)	10 x 1 = 10	MCQ
K2, K3	11 – 15	B (Either or pattern)	5 x 4 = 20	Short Answers
K3, K4	16 – 21	C (Answer 3 out of 6)	3 x 6 = 18	Descriptive/ Detailed
K4, K5	22	D (Compulsory Question)	1 x 7 = 7	Application Based/ HOTS

C. Question Paper Pattern –Advanced Learners Course

Time: 3 Hours **Max Marks: 50**

Knowledge Level	Q. No.	Section	Marks	Description
K2, K3	1 – 5	A (Answer all the Questions)	5 × 4 = 20	Short Answers
K3 , K4	6 – 10	B (Either or pattern)	5 × 6 = 30	Descriptive/ Detailed

NOTE: The questions should be numbered continuously running through the Sections A, B and C.

Questions should be evenly distributed among the unit in the syllabus in all the sections of the question paper. While framing questions with internal choice the questions must be identified as (a) or (b). (e.g. 11. a or b). Further, the internal choice must be from the same unit.

The Controller of the Examinations shall arrange for the setting of question papers on the basis the syllabus and the pattern of question paper duly certified by the Chairpersons of the respective Board of Studies.

24. Revision of Regulations and Curriculum

The above Regulation and Scheme of Examinations will be in vogue without any change for a minimum period of three years from the date of approval of the Regulations. The Board may revise / amend / change the Regulations and Scheme of Examinations, if found necessary.

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CURRICULUM

NEHRU ARTS AND SCIENCE COLLEGE

(An Autonomous Institution affiliated to Bharathiar University)
(Reaccredited with "A" Grade by NAAC, ISO 9001:2015 & 14001:2004 Certified
Recognized by UGC with 2(f) &12(B), Under Star College Scheme by DBT, Govt. of India)
Nehru Gardens, Thirumalayampalayam, Coimbatore - 641 105, Tamil Nadu.

DEPARTMENT OF COMPUTER SCIENCE

PROGRAMME: B. Sc. Computer Science (Data Science)

PROGRAMME OUTCOMES

PO1	**Critical Thinking**	Provide students with knowledge and skills in both computer science and statistical modeling for data-intensive problem solving and scientific discovery.
PO2	**Usage of Technology**	Equip students with software engineering and machine learning skills to design and implement efficient, data-driven solutions to real world problems
PO3	**Effective Communication**	Train students for careers and advanced studies in a wide range of applied computer science, engineering, business, and biotechnology disciplines
PO4	**Environment and Sustainability**	Develop articulate, conscientious leaders and problem solvers who are committed to contributing to their fields and society.
PO5	**Individual and Team Work**	Provide students with a broad foundation of knowledge and skills and cultivate a commitment to life-long learning.
PO6	**Ethics and Values**	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO7	**Social Interactions**	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.
PO8	**Life Long Learning**	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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Nehru Gardens, Thirumalayampalayam, Coimbatore - 641 105, Tamil Nadu.

DEPARTMENT OF COMPUTER SCIENCE

PROGRAMME: B. Sc. Computer Science (Data Science)

PROGRAMME SPECIFIC OUTCOMES (PSOs)

After the successful completion of the programme, the students are expected to

PSO1	Obtain ability to specify, design, develop, test and maintain usable software systems that behave reliably and efficiently and satisfy all the requirements that customers have defined for them.
PSO2	Gain skill to develop software systems that would perform tasks related to research, Education and training and /or E-Governance.
PSO3	Expertise in determining and optimizing the performance of a given algorithm on a given platform.
PSO4	Acquire capacity to anticipate the changing direction of information technology and evaluate and communicate the likely utility of new technologies to an individual or organization.
PSO5	Make the students capable in decision making at personal and professional level.

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Nehru Gardens, Thirumalayampalayam, Coimbatore - 641 105, Tamil Nadu.

Scheme of Examination

B. Sc. Computer Science (Data Science)

Programme Code: UDT

(Applicable to the students admitted during the year 2023-2024 onwards)

Semester	Part	Subject Code	Name of the Subject	Instruction hours / week	Duration of Examination	Examination Marks			Credits
						CIA	ESE	Total	
I	I	23U1TAM101/ 23U1HIN101/ 23U1MAL101/ 23U1FRN101	Elanthamizh Rachnathmak Hindi Kadhayum Samskaravum Le Français Fondamental - I	4	3	20	55	75	3
	II	23U2ENG101	Professional English I	4	3	20	55	75	3
	III	23U3CKC101	Core Paper I: Python Programming	5	3	25	75	100	4
		23U3CJC102	Core Paper II: Data Structures	5	3	25	75	100	4
		23U3DTP101	Core Paper III: Practical in Python Programming	4	3	40	60	100	4
	IV	23U3MKA101	Allied Paper I: Statistics for Computer Science	5	3	25	75	100	4
		21U4ENV101	@Ability Enhancement Compulsory Course: Environmental Studies	2	3	50	-	50	2
		22U4HVY201	@Value Education: Human Values and Yoga Practice	1	-	-	-	-	-
				30				600	24
II	I	23U1TAM202/ 23U1HIN202/ 23U1MAL202/ 23U1FRN202	Pynthamizh Sanchar Hindi Novelum Bhashapadanavum Le Français Fondamental - II	4	3	20	55	75	3
	II	23U2ENG202	Professional English II	4	3	20	55	75	3
	III	23U3CKC203	Core Paper IV: Java Programming	4	3	25	75	100	4
		23U3CJC203	Core Paper V: Operating System	5	3	25	75	100	4
		23U3DTP202	Core Paper VI: Practical in Java Programming	5	3	40	60	100	4
		23U3MIA202	Allied Paper II: Discrete Mathematics	5	3	25	75	100	4
	IV	21U4HRC202	@Ability Enhancement Compulsory Course: Human Rights and Constitution of India	2	3	50	-	50	2
		22U4HVY201	@Value Education: Human Values and Yoga Practice	1	2	50	-	50	2

				30				**650**	**26**
III	III	23U1TAM303/ 23U1HIN303 / 23U1MAL303/ 23U1FRN303	Arunthamizh Sahityak Hindi Kavithayum Smarannayum Le Français General - III	4	3	20	55	75	3
		23U2ENG303	Communicative English - I	4	3	20	55	75	3
		23U3DTC303	Core Paper VII: Introduction to Data Science	4	3	20	55	75	3
		23U3DTC304	Core Paper VIII: RDBMS and MySQL	3	3	20	55	75	3
		23U3DTP305	Core Paper IX: Practical inRDBMS and MySQL	3	3	30	45	75	3
		23U3MKA303	Allied Paper III: Probability Distributions and Inferential Statistics	4	3	25	75	100	4
	IV	23U4DTZ301	Skill Based Paper I: Practical in Excel Analytics	4	3	30	45	75	3
		22U4NM3BT1/ 22U4NM3AT1/ 22U4NM3CAF/ 22U4NM3GST/ 22U4NM3WRT	# @Basic Tamil - I / ##Advanced Tamil - I/ * NME: Consumer Affairs /Gender Sensitization/ Women's Rights	2	3	50		50	2
		SBOEC	Skill Based Open Elective Courses- Extra Departmental Course	2	3	-	50	50	2
		23U4DTVALC	**Skill Enhancement: Value Added Course - Institute IndustryLinkage	-	-	-	-	-	-
				30				**650**	**26**
IV	III	23U1TAM404/ 23U1HIN404 / 23U1MAL404/ 23U1FRN404/	Muththamizh Prayogik Hindi Drisykala Sahithyam Le Français General - IV	4	3	20	55	75	3
		23U2ENG404	Communicative English-II	4	3	20	55	75	3
		23U3DTP406	Core Paper X: Practical in R Programming	4	3	30	45	75	3
		23U3CKC408	Core Paper XI: R Programming	4	3	20	55	75	3
		23U3MKA404	Allied Paper IV: Linear Algebra and Basics of Calculus	6	3	25	75	100	4
	IV	23U4DTZ402	Skill Based Paper II: Practical in Internet of Things	4	3	30	45	75	3
	III	23U3DTV407	Internship	-	-	50	-	50	2
	IV	22U4NM4BT2/ 22U4NM4AT2/ 21U4NM4GEN	# @Basic Tamil - II / ##Advanced Tamil - II/ General Awareness	2	3	50		50	2
		VBOEC	Value Based Open Elective Course-Intra School Course	2	3	-	50	50	2

		23U4DTVALC	** Skill Enhancement: Value Added Course - Institute IndustryLinkage	-	-	-	-	-	Grade
				30				**625**	**25**
V	III	23U3DTC508	Core Paper XII: Machine Learning	5	3	20	55	75	3
		23U3DTC509	Core Paper XIII: Introduction to Artificial Intelligence	5	3	25	75	100	4
		23U3DTC510	Core Paper XIV: Data Visualization	4	3	20	55	75	3
		23U3DTP511	Core Paper XV: Practical in Machine Learning	5	3	40	60	100	4
		23U3DTE501/ 23U3DTE502/ 23U3DTE503/ 23U3DTE504	Discipline SpecificElective Paper I	6	3	25	75	100	4
	IV	23U4DTZ503	Skill Based Paper III: Practical in TABLEAU	5	3	30	45	75	3
				30				**525**	**21**
VI	III	23U3DTC612	Core Paper XVI: Big Data Analytics	5	3	20	55	75	3
		23U3CJC608	Core Paper XVII: Deep Learning	4	3	20	55	75	3
		23U3DTE605/ 23U3DTE606/ 23U3DTE607/ 23U3DTE608	Discipline Specific Elective Paper II	6	3	25	75	100	4
		23U3DTE609/ 23U3DTE610/ 23U3DTE611/ 23U3DTE612	Discipline Specific Elective Paper III	6	3	25	75	100	4
		23U3DTV613	Project and Viva-Voce	4	3	30	45	75	3
	IV	23U4DTZ604	Skill Based Paper IV: Practical in Big Data Analytics	5	3	30	45	75	3
	V	23U5EXT601	Extension Activities	-	-	50	-	50	2
				30				**550**	**22**
Total								3600	144
Additional Credit (Optional)			**Semester II-V**					8$	

 # Basic Tamil -Students who have not studied Tamil up to 12th standard.

##**Advanced Tamil** – Students who have studied Tamil language up to 12th standard and chosen other languagesunder part I of the UG programme but would like to advance their Tamil language skills.

*** NME** – Student shall choose any one course out of three courses.

@ No End Semester Examinations. Only Continuous Internal Assessment (CIA)

$ - Not included in Total marks and CGPA Calculation

** Examination and Evaluation for value added course shall be conducted by the industry and the marks shall besubmitted to the Controller of Examination for the award of the degree.

LIST OF DISCIPLINE SPECIFIC ELECTIVE PAPERS:

Elective Papers	Course Code	Name of the Course
Elective Paper I	23U3DTE501/	Soft Computing
	23U3DTE502/	Digital Image Processing
	23U3DTE503/	Data Science for Business Analytics
	23U3DTE504	Distributed System Concepts and Design
Elective Paper II	23U3DTE605/	Computer Networks
	23U3DTE606/	Web Media Analytics
	23U3DTE607/	Cloud Analytics
	23U3DTE608	Fundamentals of IOT Analytics
Elective Paper III	23U3DTE609/	Software Engineering
	23U3DTE610/	Data Science for Marketing
	23U3DTE611/	Bio-Inspired Computing for Data Science
	23U3DTE612/	Introduction to Social Media Analytics

Extra Departmental Course

S. No.	Semester	Course Code	Course Title
1	III	22U4CS3ED1	Multimedia Technologies
2		22U4CS3ED2	Web Designing

Intra School Course offered by the Department to other Department Students (within the School)

S. No	Course Code	Name of the Course
1	22U4VBOE01	Design Ecosystem
2	22U4VBOE02	Design Thinking
3	22U4VBOE03	Disaster Management
4	22U4VBOE04	Environmental Pollution and Waste Management (EMS)
5	22U4VBOE05	History of Ancient India
6	22U4VBOE06	Indian Knowledge System
7	22U4VBOE07	Principles of IPR
8	22U4VBOE08	Science, Society and Culture
9	22U4VBOE09	Community Engagement
10	22U4VBOE10	Emotional Intelligence
11	22U4VBOE11	Fundamentals of Tourism
12	22U4VBOE12	Health Education
13	22U4VBOE13	Media and Politics
14	22U4VBOE14	Positive Psychology and Work Life
15	22U4VBOE15	Professional Ethics
16	22U4VBOE16	The Science of Happiness
17	NCC	

- Students shall opt any course within their Schools.

NCC – Students who qualify NCC B Certificate Examination need not appear for these open Electives.

The Credits shall be transferred.

Self Study Paper offered by Department of Computer Science

S. No.	Semester	Course code	Course Title
1	Semester II to V	22UCSSS01	Libre Office
2		22UCSSS02	Management Information System

9/9/2023

Chairman
Board of Studies in Computer Science
Nehru Arts and Science College
Coimbatore

BoS - Chairman
Department of Computer Science
Nehru Arts and Science College
(Autonomous)
Coimbatore - 641 105.

Academic Council
Dr. B. Anirudhan
Chairman
Nehru Arts and Science College

SYLLABUS

Course Code	Title		
23U1TAM101	Part - I : Elanthamizh (இளந்தமிழ்)		
Semester: I	Credits: 3	CIA: 20 Marks	ESE: 55 Marks
Course Objective	மொழி இலக்கியத்தின் வாயிலாக அறம் சார் பண்பு மற்றும் ஆளுமைமிக்க மாணவர்களை உருவாக்குதல்.		
Course Category	Skill Development (மாணவர்களின் மொழித்திறனை ஊக்குவித்தல்)		
Development Needs	Regional (உலக அளவில் தமிழ் மொழியின் அவசியத்தை உணர்த்துதல்)		
Course Description	மாணவர்களின் மொழித்திறனை ஊக்குவித்தல் மற்றும் உலக அளவில் தமிழ் மொழியின் அவசியத்தை உணர்த்துதல்		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	சங்க இலக்கியங்கள் வாயிலாக சமூகச் சீர்திருத்தச் சிந்தனைகள் பெறப்படும்.	விரிவுரை/ காணொளிப்பட விளக்கம்	ஒப்படைவு
CO 2	அற இலக்கியங்களின் வழி தமிழர்களின் வாழ்வியல் பண்புகளைக் கற்று அறிதல்.	விரிவுரை	குழுத்திட்டம்
CO 3	பெண்ணியக் கவிஞர்களின் படைப்புத்திறனை மாணவர்களுக்கு உணர்த்துதல்	விரிவுரை/ காணொளிப்பட விளக்கம்	கருத்தரங்கு
CO 4	சிறுகதைகளின் வழி சமூக கருத்துகளை மாணவர்களுக்கு அறிவுறுத்தல்	விரிவுரை / குழு விவாதம்	ஒப்படைவு
CO 5	தமிழ் இலக்கிய வரலாற்றுத் திறனை வளர்த்தல்	விரிவுரை/ குழு விவாதம்	கருத்தரங்கு

Offered by தமிழ்த்துறை

Course Content : Elanthamizh (இளந்தமிழ்) — **Instructional Hours / Week : 4**

Unit	Description	Text Book	Chapters
I	சங்க இலக்கியம்	1. ஐங்குறுநூறு 2. பதிற்றுப்பத்து 3. பத்துப்பாட்டு - முல்லைப்பாட்டு 4. சிறுபாணாற்றுப்படை	கிள்ளைப்பத்து (281-290) பாடல்கள் இரண்டாம் பத்து (11-15 ஐந்து பாடல்கள்) முல்லைப்பாட்டு முழுவதும் (1-103 வரிகள்) சேரநாட்டின் வளமை
		Instructional Hours	**12 Hours**
Suggested Learning Methods: நாடக முறையில் கலந்துரையாடல்			
II	அற இலக்கியம் நீதிநூல்கள்	1. அறன் வலியுறுத்தல் 2. புகழ் 3. வாய்மை 4. நாலடியார்-பொருட்பால் 5. நான்மணிக்கடிகை	31 - 40 குறட்பாக்கள் 231 - 240 குறட்பாக்கள் 291 - 300 குறட்பாக்கள் 11 ஆவது அதிகாரம் (கூடா நட்பு 1-10) முதல் ஐந்து பாடல்கள்
		Instructional Hours	**12 Hours**
Suggested Learning Methods : கலந்துரையாடல்			
III	பெண்ணியக் கவிதைகள்	1. ஆண்டாள் பிரியதர்ஷினி 2. கவிஞர் இளம்பிறை 3. சுகிர்தராணி 4. அ. வெண்ணிலா	பூச்சி வாழ்க்கை- சுயம் பேசும் கிளி தொட்டிச்செடி அம்மா நீரில் அலையும் முகம்
		Instructional Hours	**12 Hours**
Suggested Learning Methods : புதுக்கவிதை எழுதும் திறன் பெற்றமை			

IV	சிறுகதைகள்	1. குட்டி ரேவதி 2. ஜெயமோகன் 3. ச.தமிழ்ச்செல்வன் 4. வண்ணநிலவன் 5. உமாமகேஸ்வரி	நிறைய அறைகள் உள்ள வீடு யானை டாக்டர் வெயிலோடு போய் எஸ்தர் மரப்பாச்சி
		Instructional Hours	**12 Hours**
Suggested Learning Methods : சிறுகதை படைக்கும் திறன் பெற்றமை			
V	தமிழ் இலக்கிய வரலாறு	1. புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும் 2. சிறுகதையின் தோற்றமும் வளர்ச்சியும் 3. படிமம், குறியீடு பற்றிய – விளக்கம்	தமிழ் இலக்கிய வரலாறு
		Instructional Hours	**12 Hours**
Suggested Learning Methods : குழு விவாதம்			
		Total Hours	**60 Hours**

Text Books	இளங்கலை முதலாம் ஆண்டுத்தமிழ் மாணவர்களுக்குரிய பாடநூல்"**இளந்தமிழ்"** தொகுப்பு: தமிழ்த்துறை ,நேரு கலை மற்றும் அறிவியல் கல்லூரி, கோயம்புத்தூர்.
Reference Books	சங்க இலக்கியம் - உரையாசிரியர் ஒளவை. துரைசாமிப்பிள்ளை, பதிப்பாசிரியர்கள் இரா.இளங்குமரனார், முனைவர்.பி.தமிழ்மகன், தமிழ்மண் அறக்கட்டளை, சென்னை.17. நிறைய அறைகள் உள்ள வீடு - குட்டிரேவதி எழுத்து பிரசுரம், 11மாடல் நகர், 10-ஆவது வீதி, சென்னை.
Web. URLs	https://youtu.be/2SMM5LvZYo0

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Seminar	Assignment	Group Project	Total
4	4	5	2	2	3	20

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	-	-	H	-	H	H	M	H	L	L	L	L	L
CO2	-	-	M	-	H	L	H	H	L	L	L	L	L
CO3	-	-	L	-	M	M	H	H	L	L	L	L	L
CO4	-	-	**H**	-	**H**	**M**	**M**	**L**	L	L	L	L	L
CO5	-	-	**H**	-	**H**	**L**	**H**	**H**	L	L	L	L	L

H-High; M-Medium; L-Low

Course designed by	Verified by chairman
Dr. S. Satheesh kumar	Dr. A. Sridevi

Course Code			
23U1HIN101	Part - 1 - Rachnathmak Hindi (रचनात्मक हिंदी)		
Semester: I	Credits: 3	CIA: 20 Marks	ESE: 55 Marks
(Common to all UG Programmes)			
Course Objective	हिंदी भाषा का अच्छा ज्ञान प्राप्त करने के लिए।		
Course Category	Skill Development		
Development Needs	Regional		
Course Description	Improves Accuracy & Quality, Improves Communication Skillls		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	नाटक से रचनात्मकता का विकास होता है। यह हमारे आसपास की दुनिया को समझने में भी मदद करता है।	Lecture / Video Methods	Assignment
CO 2	कहानियां छात्रों की कल्पना और जिज्ञासा को जगाने में मदद करती हैं।	Case Studies	Group Project
CO 3	व्याकरण हिंदी भाषा को सही ढंग से बोलने, लिखने और समझने में मदद करता है। विज्ञापन लेखन और कहानी लेखन छात्रों को उनके रचनात्मक लेखन और कल्पना शक्ति को विकसित करने में मदद करेगा।	Lectures / Video Lessons	Seminar
CO 4	अनुवाद सभी लोगों के बीच प्रभावी संचार को सक्षम बनाता है।	Lecture / Video Methods	Assignment
CO 5	गद्यांश लेखन लिखित पाठ के सार को समझने और संदर्भ के आधार पर आपके निष्कर्षों का अनुमान लगाने में आपकी बुद्धिमत्ता का आकलन करता है।	Lecture / Dumb Charades	Seminar

Offered by	Hindi

Course Content	Instructional Hours / Week : 4

Unit	Description	Text Book	Chapters
I	नाटक लड़ाई - 1979 - सर्वेश्वर दयाल सक्सेना	1	All
		Instructional Hours	12
Suggested Learning Methods : Visual Learning			
II	कहानी - 1. मजबूरी' - मन्नू भंडारी 2. ठाकुर का कुआँ - मुंशी प्रेमचंद 3. चीफ की दावत - भीष्म साहनी 4. भोलाराम का जीव -हरिशंकर परसाई	1	1 to 4
		Instructional Hours	12
Suggested Learning Methods : Auditory			
III	1. अनुप्रयुक्त व्याकरण - संज्ञा, सर्वनाम, क्रिया और विशेषण की पहचान करना। 2. विज्ञापन लेखन 3. दिए गए संकेतों से कहानी लेखन।	1	1,2,3

		Instructional Hours	**12**
Suggested Learning Methods : Comprehensive writing			
IV	**अनुवाद : अंग्रेज़ी से हिंदी** (**अनुवाद अभ्यास** - 3) 1 - 10 **अनुच्छेद**	3	1,2
		Instructional Hours	12
Suggested Learning Methods : Auditory, Visual			
V	पारिभाषिक शब्दावली , गद्यांश लेखन	5	1,2
		Instructional Hours	**12**
Suggested Learning Methods : Comprehensive writing			
		Total Hours	**60**

Text Books	1. नाटक लड़ाई - 1979 - सर्वेश्वर दयाल सक्सेना 2. 2. कहानी संग्रह 3. अनुवाद अभ्यास - 3 दक्षिण भारत हिंदी प्रचार सभा , चेन्नई -17 4. Bharatdarshan.co.nz 5. भाषाशास्त्र का पारिभाषिक शब्द कोश - राजेंद्र द्विवेदी 6. श्री रामदेव , व्याकरण प्रदीप, लोक भारती प्रकाशन, इलाहाबाद
Reference Books	संदर्भ ग्रंथ 1. हिंदी नाटक और रंगमंच - डॉ राम कुमार वर्मा 2. हिन्दी अलोचना की परीभाषिक शब्दावली - पेपरबैंक 3. आधुनिक हिंदी व्याकरण और रचना - डॉ. वासुदेव नंदन प्रसाद
Web. URLs	

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Group project	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	-	-	H	M	M	L	-	-	L	L	L	L	L
CO2	-	-	H	L	L	H	-	-	L	L	L	L	L
CO3	-	-	-	L	M	H	-	-	L	L	L	L	L
CO4	-	-	M	M	H	L	-	-	L	L	L	L	L
CO5	-	-	L	M	H	L	-	-	L	L	L	L	L

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Dr.S.Swarnalatha	Dr.S.Swarnalatha

Course Code			
23U1MAL101	**Part - I : Kadhayum Samskaaravum (കഥയും സംസ്കാരവും)**		
Semester: I	**Credits: 3**	**CIA: 20 Marks**	**ESE: 55 Marks**

(Common to all UG Programmes)

Course Objective	ആധുനികകാലത്തെ മലയാളകഥകളെ കുറിച്ചും സംസ്കാരത്തെ കുറിച്ചും അവബോധം ഉണ്ടാക്കുന്നു
Course Category	Skill Development
Development Needs	Regional
Course Description	Improve accuracy & quality, improve communication

Course Outcomes		**Teaching Methods**	**Assessment Methods**
CO 1	കഥയുടെ സംവേദനം ആസ്വാദകന്റെ അഭിരുചിയെ പൂർത്തിയാക്കുന്നു	Lecture / Video Methods	Assignment
CO 2	പ്രകൃതിയുമായി ബന്ധപ്പെടുന്ന കഥാപരിസരം	Case studies	Group Project
CO 3	ഭക്ഷണവും അതിന്റെ സംസ്കാരവും കൂട്ടായ്മ ഉണ്ടാക്കുന്നു	Lectures / Video Lessons	Seminar
CO 4	ഭക്ഷണത്തിന്റെ മൂല്യം അർത്ഥവത്താക്കുന്നു	Lecture / Video Methods	Assignment
CO 5	ആശയ വിപുലനം	Lecture / Dumb Charades	Seminar

Offered by | **Malayalam**

Course Content | **Instructional Hours / Week : 4**

Unit	**Description**	**Text Book**	**Chapters**
I	ചെറുകഥകൾ - സമകാലിക കഥകൾ 1. പരുന്ത് - ഇ.സന്തോഷ്കുമാർ 2. പാലാഴിമഥനം - കെ.രേഖ 3. കുളവാഴ - വി .എം .ദേവദാസ് 4. മരണമുണ്ടാക്കിക്കളിക്കാം - പി .വി ഷാജികുമാർ 5. കക്കുകളി - ഫ്രാൻസിസ് നൊറോണ	1	1 to 5
	Instructional Hours		**12**
Suggested Learning Methods : Visual Learning			
II	നവോത്ഥാനകഥകൾ 1. വെള്ളപ്പൊക്കത്തിൽ - തകഴി 2. ബസു യാത്ര - കേശവദേവ് 3. മരപ്പാവകൾ - കാരൂർ 4. മാണിക്കൻ - ലളിതാംബിക അന്തർജനം 5. ജന്മദിനം - ബഷീർ	1	6 to 10
	Instructional Hours		**12**
Suggested Learning Methods : Auditory			
III	സംസ്കാര പഠനം - കേരളത്തിലെ രുചിഭേദങ്ങൾ 1. കാസർകോടും കന്നയാളവും ദൈവവിപ്ലവത്തിന്റെ കണ്ണൂരും	1	1,2,3

	2. സാമൂതിരി ,മുട്ടമാല ,എരന്ത് ,ബ്രാഹ്മണാൾ -(കോഴിക്കോട്) 3. മലപ്പുറം കേരളത്തിൻറെ അറേബ്യ		
		Instructional Hours	**12**
Suggested Learning Methods : Comprehensive writing			
IV	സംസ്കാര പഠനം - കേരളത്തിലെ രുചിഭേദങ്ങൾ 1. ചേട്ടായിയെ ഇത് ശൂരാട്ടാ - തൃശ്ശൂർ 2. കരിമ്പനകളുടെ നാട്ടിൽ - പാലക്കാട്	1	4,5
		Instructional Hours	**12**
Suggested Learning Methods : Auditory, Visual			
V	നവമാധ്യമങ്ങൾ - വിവർത്തനം	1	1,2,3
		Instructional Hours	**12**
Suggested Learning Methods : Comprehensive writing			
		Total Hours	**60**

Text Books	1. ചെറുകഥകൾ - (10 ചെറുകഥകൾ) 2. സംസ്കാര പഠനം - നാടൻ കേരള എക്സ്പ്രസ്സ് ഡോ.സി. ഗണേഷ്, ഗ്രീൻ ബുക്ക്സ് തൃശ്ശൂർ 3. നവമാധ്യമങ്ങൾ - ടി.കെ .സന്തോഷ്കുമാർ ഡി.സി.ബുക്ക്സ് കോട്ടയം
Reference Books	1. എം. അച്യുതൻ - ചെറുകഥ ഇന്നലെ ഇന്ന് - ഡി.സി.ബുക്സ് കോട്ടയം 2. ചെറുകഥയുടെ ഛന്ദസ്- വി. രാജകൃഷ്ണൻ മാതൃഭൂമി ബുക്സ് കോഴിക്കോട് 3. പുതിയ കഥ പുതിയ വായന - എഡി : ഡോ.ഷീബാ ദിവാകരൻ പുസ്തകലോകം പ്രസദ്ധീകരണം കോഴിക്കോട് 4. കേരള സംസ്കാരം - എ .ശ്രീധര മേനോൻ നാഷണൽ ബുക്ക്സ് കോട്ടയം 5. ന്യൂസ് റൂമിന്റെ അകവും പുറവും - ബി.ആർ .പി.ഭാസ്കർ ഗ്രീൻ ബുക്ക്സ് തൃശ്ശൂർ
Web. URLs	**http://www.keralaculture.org>literature**

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Group project	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO 5
CO1	H	H	H	M	H	H	H	H	L	L	L	L	L
CO2	H	H	H	L	H	M	H	H	L	L	L	L	L
CO3	H	M	H	M	M	H	H	M	L	L	L	L	L
CO4	H	H	L	M	L	H	H	H	L	L	L	L	L
CO5	H	L	L	L	H	H	H	L	L	L	L	L	L

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Ms. N. RAJANI	Dr. SMITHA C. R.

Course Code	Title		
23U1FRN101	Part - I : Le Français Fondamental - I		
Semester : I	Credits : 3	CIA : 20 Marks	ESE : 55 Marks
(Common to all UG Programmes)			
Course Objective	Acquisition of standard French through fundamental French grammar.		
Course Category	Skill Development		
Development Needs	Global		
Course Description	This course has basic knowledge of the French grammar and aims to build a solid foundation in the acquisition of standard French through fundamental French grammar		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Learn basic French grammar along with French civilisation	Lecture	Assignment
CO 2	Knows the gender of nouns	Word game/ Lecture	Seminar
CO 3	Learn Negation, articles, and understand the usage of prepositions.	Lectures / Video Lessons	Quiz
CO 4	Learn Futur proche, Pronominal verb,	Tutorial / Case Studies	Assignment
CO 5	Know to self-introduce and translate simple sentences	Lecture /	Group project

Offered by : **French**

Course Content — **Instructional Hours / Week : 4**

Unit	Description	Text Book	Chapters
I	Mes cinq sens en action	1	0
		Instructional Hours	**12**
Suggested Learning Methods: Worksheets , Reading practice			
II	S'ouvrir aux autres	1	1
		Instructional Hours	**12**
Suggested Learning Methods: Kahoot App, Worksheets			
III	Partager son lieu de vie	1	2
		Instructional Hours	**12**
Suggested Learning Methods : Audio & Visual, Speaking practice			
IV	Vivre au quotidien	1	3
		Instructional Hours	**12**
Suggested Learning Methods : Comprehensive Writing			

V	S'ouvrir à la culture	1	4
		Instructional Hours	**12**
Suggested Learning Methods: Translating simple sentences, comprehending the passage.			
		Total Hours	**60**
Text Books	Saison 1 Méthode de Français – Marie-Noëlle Cocton, Anouchka De Oliveira, Dorothée Dupleix (Unit 0 to 4)		
Reference books	A1 Echo Méthode de Français		
Web. URLs	Lingua.com, TV 5 app,		

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	-	-	H	M	H	H	-	-	-	-	-	-	-
CO2	-	-	H	L	H	M	-	-	-	-	-	-	-
CO3	-	-	-	M	M	H	-	-	-	-	-	-	-
CO4	-	-	L	M	L	H	-	-	-	-	-	-	-
CO5	-	-	L	-	H	-	-	-	-	-	-	-	-

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
D. Balaji	D. Balaji

Course Code	Title		
23U2ENG101	Part – II : Professional English – I		
Semester : I	Credits : 3	CIA : 20 Marks	ESE : 55 Marks
(Common to all UG Programmes)			
Course Objective	To help students to imbibe, develop, practice and use the LSRW skills and fine tune their productive skills.		
Course Category	Skill Development		
Development Needs	Global		
Course Description	SD: Helps to develop LSRW skill		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Recognize listening, and reading proficiency through the prose discourses.	Lecture/Tutorial	Assignment
CO 2	Use and interpret imaginative, and creative skills through the poetic genre.	Lecture/Tutorial	Assignment
CO 3	Enhance the students to use English effectively through short story.	Lecture/Tutorial	Speaking
CO 4	Execute and exercise grammatical skills in academics and career.	Lecture/Tutorial	Reading
CO 5	Evaluate the LSRW skills through literature.	Lecture/Tutorial	Writing

Offered by | **Department of English**

Course Content | **Instructional Hours / Week : 4**

Unit	Description	Text Book	Chapters
I	**Prose** Leigh Hunt – Getting Up On Cold Morning Rajagopalachari – Tree Speaks A.G. Gardiner – On the Rule of the Road **Listening Activity** – Comprehension practice from Prose.	1	1-3
	Instructional Hours		**12**
Suggested Learning Methods : Flipped Learning			
II	**Poetry** John Milton – On His Blindness Maya Angelou -Phenomenal Women A. K. Ramanujan – A River **Speaking Activity** – Group Discussion Forum	1	4-6
	Instructional Hours		**12**
Suggested Learning Methods : Flipped Learning			

III	**Short Stories** O. Henry – The Last Leaf R. K. Narayan – The Missing Mail Oscar Wilde - The Happy Prince **Reading Activity** – Pronunciation practice and enhancement from Short-stories	1	7-9
		Instructional Hours	**12**
Suggested Learning Methods : Tutorial			
IV	**Grammar** Parts of Speech Tenses Kinds of Sentences **Writing Activity** – Paragraph Writing using grammar Components	1	10-13
		Instructional Hours	**12**
Suggested Learning Methods : Tutorial			
V	**Writing Skills** Letter Writing (Formal & Informal) Notice, Writing Circular Memo, Advertisement Minutes of the Meeting	1	14-17
		Instructional Hours	**12**
Suggested Learning Methods : ABL			
		Total Hours	**60**

Text Books	Compiled by the Department of English, NASC.
Reference Books	CLIL (Content & Language Integrated Learning) – Module by TANSCHE NOTE: (Text: Prescribed chapters or pages will be given to the students by the department and the college)
Web. URLs	https://www.youtube.com/watch?v=QrUPneyZNf0

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Speaking	Reading	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	L	H	L	M	M	H	M	H	H	M	H	M
CO2	M	L	H	L	H	M	H	M	H	H	M	H	M
CO3	M	L	H	L	H	H	H	H	H	H	M	H	M
CO4	M	L	H	L	H	L	H	H	H	H	M	H	H
CO5	H	M	H	L	H	H	H	H	H	H	H	H	M

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
D Pradeek	Dr. R. Malathi

Course Code	Title		
23U3CKC101	Core Paper I: Python Programming		
Semester: I	Credits: 4	CIA: 25 Marks	ESE: 75 Marks
(Common to B. Sc. IT / AIML / BCA / DCFS / CS (DS))			
Course Objective	To develop algorithmic solutions to simple computational problems using Python		
Course Category	Employability		
Development Needs	Global		
Course Description	This course will provide a pragmatic and hands-on introduction to the Python programming. It helps to familiarize with different data types, operators, string methods and file operations.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the basics of Python and write simple python program.	Lecture	Assignment
CO 2	Develop Python programs with Control Statement and List method.	Demonstration	Seminar
CO 3	Apply Tuples, Functions and Set Iterators to develop simple applications	Demonstration	Quiz
CO 4	Apply Python Strings, Multithreading and Exceptions for problem solving.	Flipped Classroom	Program Execution
CO 5	Manipulate Files and perform Event Handling.	Lecture	Program Execution

Offered by	Information Technology
Course Content	Instructional Hours / Week : 5

Unit	Description	Text Book	Chapters
I	**Fundamentals of Python Programming:** Introduction – Features – Applications – Installation-Sample Program-Python Virtual Machine-Memory management in Python-Comparison between C, Java and Python- Keywords, Identifiers, Statements, Indentation. Syntax and Styles: Data Types – Literals – Variables-Operators and Expressions-Evaluation of Expression-Sample Programs.	1	1,2
		Instructional Hours	**15**
Suggested Learning Methods: Video lectures about the basics of Python Programming			
II	**Control Flow:** If – While – For – Break – Continue-Pass-Entry Controlled Loop - Exit Controlled Loop – Counter Controlled Loop - Condition Controlled Loop - Nested Loop - Sample Programs. Arrays-Sequences - Python Lists: Read a List type from a Keyboard-Accessing Elements of a List- Modifying Elements of a List – Basic Operations - Built-in Functions – Python List Methods.	1,2	3,4,5,9
		Instructional Hours	15
Suggested Learning Methods: Practice using Flow Charts			
III	Tuples - Need of a Tuple -Sequence of Unpacking – Methods –Sample programs. Dictionaries: Making a Dictionary-Basic Operations-Dictionary Operations – Sets- Iterators and Generators – Sample Programs. Functions: Defining Functions-Calling Functions-Passing Arguments-Keyword Arguments - Default Arguments-Required	1	6,7,8

	Arguments-Variable Length Arguments-Return Statements-Nesting of Passing Arguments-Anonymous Functions-Recursive Functions- Scope of Local and Global Variables.		
		Instructional Hours	15
Suggested Learning Methods: Develop small programmes using tuples			
IV	**Strings in Python:** Reading – Accessing – Modifying – Finding - Iterating through a String - Build-in String Functions. Errors and Exceptions – Multithreading	2	8
		Instructional Hours	
Suggested Learning Methods: Develop small applications			
V	**Files and Directory Access:** Files and Streams - Opening a File - Reading/Writing Operations in a File - Other operations in a File - Iterating through a File - Splitting Words - Serialization and Deserialization. Events: Event Objects - Binding callbacks to events - Event names - Keyboard events - Mouse Events - Sample Programs	1	13,17
		Instructional Hours	15
Suggested Learning Methods: Laboratory practice			
		Total Hours	**75Hrs**

Text Books	1. Ch.Satyanaryana, M.Radhika Mani, B.N. Jagadesh, Python Programming, University Press Pvt. Ltd.2018. 2. Dr.S.A.Kulkarni, Problem Solving and Python Programming, 2nd Edition, Yesdee Publishing,2018
Reference Books	1. Allen B. Downey, Think Python: How to Think Like a Computer Scientist, 2nd edition, Updated for Python 3, Shroff/O'Reilly Publishers,2016 2. Guido van Rossum and Fred L. Drake Jr, An Introduction to Python – Revised and updated for Python 3.2, Network Theory Ltd.,2011.
Web. URLs	https://www.w3schools.com/python/

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
5	5	6	3	3	3	25

Mapping

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	L	M	M	-	-	M	H	H	M	M
CO2	M	M	M	M	H	M	-	-	H	H	H	M	H
CO3	H	L	M	H	M	M	-	-	M	H	H	M	M
CO4	M	H	L	M	L	L	-	-	H	M	H	H	M
CO5	M	M	H	H	M	H	-	-	H	H	M	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Dr. D. Suryaprabha	Dr. J. Maria Shyla

Course Code	Title		
23U3CJC102	Core Paper II: Data Structures		
Semester: I	Credits: 4	CIA: 25 Marks	ESE: 75 Marks
Common to B.Sc. CS(DS)/AIML			
Course Objective	To enable the students to understand about the various techniques such as Linked list, Searching and Sorting, apply them to solve complex programs.		
Course Category	Skill Development		
Development Needs	Global		
Course Description	To understand the concept of Arrays, Stacks , and Queues, Linked list, searching and sorting and apply to solve real world problem using appropriate Data Structure		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the representation of Arrays, Stacks and Queues.	Lecture	Group Discussion
CO 2	Solve the problems using Queues and List.	Demonstration	Quiz
CO 3	Demonstrate different types of Tree representation and Graph.	Lectures	Seminar
CO 4	Design Algorithm to perform different types of Sorting.	Tutorial	Seminar
CO 5	Illustrate Symbol, hash and File organization, apply to solve real world problem using appropriate Data Structure.	Lecture	Assignment

Offered by	Computer Science

Course Content	Instructional Hours / Week : 5

Unit	Description	Text Book	Chapters
I	**Introduction:** Overview - Create Programs - Analyze Programs. **Arrays:** Axiomatization - Sparse Matrices - Representation of Arrays. **Stacks & Queues:** Fundamentals - Evaluation of Expressions - Multiple Stacks and Queues.	1	1,2,3
		Instructional Hours	15
Suggested Learning Methods : Write Algorithms for Real time Scenario			
II	**Recursion:** Recursive definition and process - recursion in C - Writing Recursive program - simulating Recursion - efficiency of recursion. **Queues and List:** The queue and its sequential representation - Linked list - List in C - An example Simulation using linked list - other list structure.	2	3,4
		Instructional Hours	15
Suggested Learning Methods : Write Algorithms for Real time Scenario			
III	**Trees:** Binary Tree - Binary Tree representation - the Huffman algorithm - representing list as Binary - Trees and their applications - Game trees.	2	5,8

	Graphs: A Flow problem - The linked representation of Graph - Graph traversal and spanning forests		
		Instructional Hours	15
Suggested Learning Methods : Group Discussion			
IV	**Internal Sorting:** Insertion Sort - Quick Sort - 2-Way Merge Sort - Heap Sort - Shell Sort. **External Sorting:** Storage Devices - K-Way Merging- **Sorting With Tapes:** Balanced Merge Sorts - Polyphase Merge.	1	7, 8
		Instructional Hours	15
Suggested Learning Methods : Group Discussion			
V	**Symbol Table:** Static Tree Tables - Dynamic Tree Tables - **HashTables:** Hashing Functions- Overflow Handling. **Files:** Files, Queries and Sequential Organizations- Index Techniques - **File Organization:** Sequential Organization- Random Organization- Linked Organization.	1	9,10
		Instructional Hours	15
Suggested Learning Methods : Video Presentation2			
		Total Hours	75 Hrs

Text Books	1. Ellis Horowitz &SartajSahni, **Fundamentals of Data Structures**, Galgotia Publication. 2. Aaron M. Tenenbaum, YedidyahLangsam, Moshe J.Augenstein, **Data Structure using C**, Pearson Education, 2009.
Reference Books	1. Ellis Horowitz, SartajSahni&SanguthevarRajasekaran, **Fundamentals ofComputer Algorithms**, GalgotiaPublicationsPvt Ltd, 1999. 2. Jean-Paul Tremblay and Paul G.Sorenson, **An Introduction to Data Structures with Applications**, Second Edition, Tata MaGraw Hill,2008 3. Mark Allen Weiss, **Data Structures and Algorithm Analysis in C**, Florida International University, Pearson Education, Second Edition, 1997.
Web. URLs	https://www.tutorialspoint.com/data_structures_algorithms/index.htm

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
5	5	6	3	3	3	25

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	-	M	M	-	M	H	H	H	H	M	M
CO2	H	H	-	M	M	-	M	H	H	H	H	M	M
CO3	H	H	-	M	M	-	M	H	H	H	H	H	H
CO4	H	H	-	M	M	-	M	H	H	H	H	H	H
CO5	H	H	-	M	M	-	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by
Dr. JULIET ROZARIO	Dr. N. KAVITHA

Course Code	Title		
23U3DTP101	Core Paper III: Practical in Python Programming		
Semester: I	Credits: 4	CIA: 40 Marks	ESE: 60 Marks

Course Objective	To introduce the concepts of python programming constructs.
Course Category	Skill Development
Development Needs	Global
Course Description	To development skill set in python programming and apply the concepts to develop applications in order to meet the Local and Global needs

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Develop simple Python programs.	Program Demonstration	Program Creativity
CO 2	Understand and apply the concept of control statements.	Program Demonstration	Debugging
CO 3	Apply the concept of looping constructs and functions for solving basic programs.	Program Demonstration	Application of Logic
CO 4	Develop programs for sorting of Strings, Lists, Tuples and File handler.	Program Demonstration	Program Development
CO 5	Create programs using Linear and Binary Search Techniques	Program Demonstration	Program Development

Offered by	**Computer Science(Data Science)**
Course Content	**Instructional Hours / Week : 4**

Program List

1. Write a python program that displays the following information: Your name, Full Address Mobile, number, College name, Course subjects.
2. Write a python program to find the largest three integers using if-else and conditional operator.
3. Write a python program that asks the user to enter a series of positive numbers (The user should enter a negative number to signal the end of the series) and the program should display the numbers in order and their sum.
4. Write a python program to find the product of two matrices.
5. Write recursive functions for GCD of two integers.
6. Write recursive functions for the factorial of positive integer.
7. Write recursive functions for Fibonacci Sequence upto given number n.
8. Write recursive functions to display prime number from 2 to n.
9. Write a python program that writes a series of random numbers to a file from 1 to n and display.

10. Write a python program to sort a given sequence: String, List and Tuple.
11. Write a python program to make a simple calculator.
12.Write a python program for Linear Search and Binary Search.
13. Write python program in which a function(with single string parameter)is defined and Calling that function prints the string parameters given to function.
14.Write python program in which a class is define, then create object of that class and call Simple print function define in class.

Total Hours	**60 Hrs**

Tools for Assessment (40 Marks)

Laboratory Performance- Application of Logic	Laboratory Performance- Program Creativity	Laboratory Performance- Program Debugging	Test 1	Test 2	Observation Note Book	Total
5	5	5	10	10	5	40

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	L	M	H	L	M	H	H	H	H	M	M
CO2	H	H	L	M	H	L	M	H	H	H	H	M	M
CO3	H	H	L	M	H	L	M	H	H	H	H	H	H
CO4	H	H	L	M	H	L	M	H	H	H	H	H	H
CO5	H	H	L	M	H	L	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by
Dr. JULIET ROZARIO	Dr. N. KAVITHA

Course Code	Title		
23U3MKA101	**Allied Paper I : Statistics for Computer Science**		
Semester: I	**Credits:4**	**CIA: 25 Marks**	ESE: **75 Marks**
(Common to B. Sc CS(DS) and AIML Programmes)			
Course Objective	To enable the students to learn and visualize the fundamental ideas of Statistical methods.		
Course Category	**Skill Development**		
Development Needs	**Regional**		
Course Description	Statistics play an intrinsic role in computer science and vice versa. Statistics is used for data mining, speech recognition, vision and image analysis, data compression, artificial intelligence, and network and traffic modelling		

Course Outcomes		**Teaching Methods**	**Assessment Methods**
CO 1	Implement the basic concepts of measures of Central tendency and dispersion	Lecture / Peer Teaching	Assignment
CO 2	Understand the concepts of Correlation and Regression	Group learning/Lecture	Problem solving Skill
CO 3	Calculate probability using Baye's theorem	Lectures / Video Lecture	Seminar
CO 4	Know various techniques about random variables	Group Learning / Lecture	Assignment
CO 5	Analyse the properties of Binomial, Poisson and Normal.	Lecture /Tutorial	Quiz

Offered by	**Mathematics**

Course Content	**Instructional Hours / Week : 5**

Unit	**Description**	**Text Book**	**Chapters**
I	Statistics – Introduction–Measures of Central tendency- Arithmetic mean- Median - Mode Measures of dispersion – Range-Standard deviation –Quartile deviation- Coefficient of variation	1	9
		Instructional Hours	**15**
Suggested Learning Methods : Group Discussion & Quiz			**02 Hrs**
II	Correlation: Definition – Scatter diagram-Karl Pearson's correlation co-efficient-Rank correlation co-efficient –Properties. Regression: Introduction – Construction of regression equations – Properties.	1	12, 13
		Instructional Hours	15
Suggested Learning Methods : Problem solving Practice			**02 Hrs**
III	Probability: Introduction- Axioms of probability- Conditional probability- Addition theorem- Multiplication theorem- Independent event - Conditional probability -Total probability - Baye's theorem.	2	1
		Instructional Hours	15

Suggested Learning Methods : Class Test & https://youtu.be/CVvCvYFoCmM			**02 Hrs**
IV	Random variables – Discrete random variables- Probability mass function- Continuous random variables – Probability density function - Mathematical Expectation – Properties and simple problems on PMF and PDF.	2	2
		Instructional Hours	15
Suggested Learning Methods : Problem solving Practice			**02 Hrs**
V	Discrete Probability Distributions-Binomial, Poisson, Normal - Simple Problems only.	1	19
		Instructional Hours	15
Suggested Learning Methods : Practice Tests			**02 Hrs**
		Total Hours	75 Hrs

Text Books	1. R. S. N. Pillai and Bagavathi, **Statistics Theory and Practice**, S. Chand & Company Pvt. Ltd, New Delhi Unit I : Chapter 9, Page No: 124 – 139, 146 – 154, 166-172, 244-250, 259-281. Unit II : Chapter 12 & 13, Page No : 396-410, 417-420, 465 – 480 Unit V : Chapter 19, Page No: 769 – 802. 2. P. Kandasamy , K. Thilagavathi & K. Gunavathi, **Probability Statistics and Queuing Theory**, S. Chand & Company Ltd, New Delhi. Unit III : Chapter 1, Sec 1.1 – 1.4, Page No: 1 – 45. Unit IV : Chapter 2., Sec 2.1 - 2.5, Page No : 56-84, 97 – 103.
Reference Books	1. S.C. Guptha and V.K. Kapoor , **Fundamentals of Mathematical Statistics**, S. Chand and Sons, Reprint, 2009. 2. S P Gupta, **Statistical methods,** S. Chand and Sons, Reprint, 2017.
Web. URLs	**https://youtu.be/CVvCvYFoCmM** **https://www.khanacademy.org/math/statistics-probability/random-variables-stats-library/random-variables-discrete/v/random-variables** **https://www.simplilearn.com/tutorials/statistics-tutorial/probability-density-function**

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
5	5	6	3	3	3	25

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	M	H	M	H	M	L	L	L	L	L
CO2	H	H	M	M	H	M	L	M	L	M	L	M	L
CO3	H	M	L	H	H	H	M	H	L	L	L	L	L
CO4	H	M	H	H	H	H	H	M	L	M	M	M	L
CO5	H	H	L	H	H	H	H	M	L	M	M	M	L

H-High; M-Medium; L-Low

Course designed by	Verified by
S RUTH KETHSIAL	Dr. T. CHANDRAPUSPAM

Course Code	Title	
21U4ENV101	Ability Enhancement Compulsory Course - Environmental Studies	
Semester : I	Credits : 2	CIA : 50 Marks
(Common to all UG Programmes)		
Course Objective	This course enables the students to recognize the interconnectedness of multiple factors in environmental challenges and communicate clearly and competently matters of environment concern.	
Course Category	Employability	
Development Needs	National & Global	

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand key concepts from economic, political, and social analysis as they pertain to the design and evaluation of environmental policies and institutions	Lecture/ Video Lectures	Album Preparation
CO 2	Understand concepts and methods from ecological and physical sciences and their application in environmental problem solving.	Lecture/ Peer Teaching	Album Preparation
CO 3	Solve the ethical, cross-cultural, and historical context of environmental issues and the links between human and natural systems.	ABL/ Group Discussions	Group Discussions
CO 4	Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world.	Video Lessons/ Group discussions	Group Discussions
CO 5	Apply systems concepts and methodologies to analyse and understand interactions between social and environmental processes.	Field visits	Field visit Report

Course Content — **Instructional Hours / Week : 2**

Unit	Description	Text Book	Chapters
I	**Natural Resources:** Forest resources, Water resources, Mineral resources, Food resources, Energy resources and Land resources.	1	2
	Instructional Hours		**6**
Suggested Learning Methods: Video lectures			
II	**Ecosystems:** Concept of an ecosystem, Structure and function; Introduction, types, characteristic features, structure and function of ecosystem - Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries). **Activity: Prepare an album on types of Ecosystem.**	1	3
	Instructional Hours		**6**
Suggested Learning Methods: Peer Teaching			
III	**Environmental Pollution:** Definition Causes, effects and control measures of Air pollution, Water pollution, Soil pollution, Marine pollution and Noise pollution, Solid waste management. **Activity: Discuss the solutions for water pollution**	1	5

		Instructional Hours	**6**
Suggested Learning Methods : Group Discussion			
IV	**Social Issues and the Environment:** Water conservation, rain water harvesting, watershed management, Environmental ethics - Issue summits' and possible solutions and Public awareness. **Activity: Identify and analyse a Social Issue and an Environment issue in your locality.**	1	6
		Instructional Hours	**6**
Suggested Learning Methods : Role Play			
V	**Disaster Management:** Floods, Earthquakes, Cyclones, Landslides: From management to mitigation of disasters: The main elements of a mitigation and measures of strategy: Floods, Earthquakes, Cyclones and Landslides	2	16
		Instructional Hours	**6**
Suggested Learning Methods : Group Discussion			
Field Work: Visit to local area to document Environmental assets (River / Forest / Grass land / Mountain), Visit to local polluted site (Urban / Rural /industrial / Agricultural), Study of common plants, insects, birds, Study of simple ecosystem: Pond, River, Hill slopes.			
		Total Hours	**30**
Text Book(s):	1. Shashi Chawla. A Text Book of Environmental Studies, Tata McGraw-Hill, 2012. 2. From UGC website: https://www.ugc.ac.in/oldpdf/modelcurriculum/env.pdf		
Reference Book(s):	1. Agarwal, K.C. 2001 Environmental Biology, Nidi Public Ltd., Bikaner. 2. Jadhav, H &Bhosale, V.M. 1995 Environmental Protection and Laws Himalaya Pub.House, Delhi 284 p. 3. Mckinney, M.L. &Schoch R.M. 1996. Environmental Science systems & Solutions 4. Odum, E.P. 1971 Fundamentals of Ecology. W.B. Saunders Co. USA. 574 p 5. Rao MN &Datta, A.K. 1987 Waste Water treatment, Oxford & IBH Publication Co. Pvt. Ltd., 345 p.		

Tools for Assessment (50 Marks)

Ecosystem Album Preparation	Field visit and report submission	Group discussions about issues related to their locality / about Disaster Management	CIA Test	Total
10	10	5	25	50

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	-	L	H	H	H	H	L	L	-	-	-	-
CO2	L	-	L	H	H	H	H	L	L	-	-	-	-
CO3	L	-	L	H	H	H	H	L	L	-	-	-	-
CO4	L	-	L	H	H	H	H	L	L	-	-	-	-
CO5	L	-	L	H	H	H	H	L	L	-	-	-	-

H-High; M-Medium; L-Low

Course designed by	Verified by
Dr. M. THANAVEL	Dr. M. THANAVEL

Course Code	Title		
23U1TAM202	Part - I : Pynthamizh (பைந்தமிழ்)		
Semester: II	Credits: 3	CIA: 20 Marks	ESE: 55 Marks
Course Objective	மொழி இலக்கியத்தின் வாயிலாக அறம் சார் பண்பு மற்றும் ஆளுமை மிக்க மாணவர்களை உருவாக்குதல்.		
Course Category	Skill Development (மாணவர்களின் மொழித்திறனை ஊக்குவித்தல்)		
Development Needs	Global /Regional(உலக அளவில் தமிழ் மொழியின் அவசியத்தை உணர்த்துதல்)		
Course Description	மாணவர்களின் மொழித்திறனை ஊக்குவித்தல் மற்றும் உலக அளவில் தமிழ் மொழியின் அவசியத்தை உணர்த்துதல்		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	பக்தி இலக்கியங்கள் வழி வாழ்வியல் நெறிகளை மாணவர்களுக்கு எடுத்துரைத்தல்	விரிவுரை/காணொளிப்பட விளக்கம்	ஒப்படைவு
CO 2	சிற்றிலக்கியங்களின் மூலம் தமிழர்களின் வாழ்க்கை கூறுகளை எடுத்துரைத்தல்	விரிவுரை	குழுத்திட்டம்
CO 3	தமிழ் நாவல்களின் வழி சமுதாயச் சிந்தனைகளைக் கூறுதல்	விரிவுரை/காணொளிப்பட விளக்கம்	கருத்தரங்கு
CO 4	இலக்கண அறிவை வளர்த்தல்	விரிவுரை	ஒப்படைவு
CO 5	தமிழ் இலக்கிய வரலாற்றுத்திறனை மேம்பாடு அடையச் செய்தல்	விரிவுரை/ குழு விவாதம்	கருத்தரங்கு

Offered by தமிழ்த்துறை

Course Content: Pynthamizh (பைந்தமிழ்) — **Instructional Hours / Week : 4**

Unit	Description		Text Book & Chapters
I	பக்தி இலக்கியங்கள்	1. திருமந்திரம் - மூன்றாம் தந்திரம் (அதிகாரம் 2) 2. நாலாயிரத் திவ்வியப்பிரபந்தம்- பெரியாழ்வார் 3. மாணிக்கவாசகர்-எட்டாம் திருமுறை 4. திருநாவுக்கரசர்- திருவரங்கமாலை	அட்டமாசித்திகள் திருப்பல்லாண்டு அச்சோப்பதிகம் நான்காம் திருமுறை - தேவாரம்
		Instructional Hours	**12 Hours**
Suggested Learning Methods: ஆன்மிக சிந்தனைத்திறன் பெற்றமை			
II	சிற்றிலக்கியங்கள்	1. கலம்பகம் - நந்திக்கலம்பகம் 2. பள்ளு – முக்கூடற்பள்ளு 3. குறவஞ்சி – திருக்குற்றாலக்குறவஞ்சி 4. பிள்ளைத்தமிழ் - மீனாட்சியம்மை பிள்ளைத்தமிழ் 5. பட்டினத்தார் பாடல்கள்	91 -100 பாடல்கள் 350 - 360 செய்யுள்கள் 1-10 செய்யுள்கள் 1 -10 செய்யுள்கள் 358 - 367 பாடல்கள்
		Instructional Hours	**12 Hours**
Suggested Learning Methods : கலந்துரையாடல்			
III	நாவல்	1. இமையம் (வெ.அண்ணாமலை)	செல்லாத பணம்
		Instructional Hours	**12 Hours**
Suggested Learning Methods : நாவல் எழுதும் திறன் பெற்றமை			

IV	இலக்கணம்	1. வல்லினம் மிகும் இடங்கள் 2. வல்லினம் மிகா இடங்கள் 3. யாப்பின் உறுப்புகள் (எழுத்து முதல் தொடை வரை) 4. பாவின் வகைகள்	தமிழ் இலக்கணம்
		Instructional Hours	**12 Hours**
Suggested Learning Methods : பிழையின்றி தமிழ் எழுதுதல்			
V	தமிழ் இலக்கிய வரலாறு	1. சிற்றிலக்கியத்தின் தோற்றமும் வளர்ச்சியும் 2. புதினத்தின் தோற்றமும் வளர்ச்சியும் 3. பக்தி இலக்கியத்தின் தோற்றமும் வளர்ச்சியும் 4. விண்ணப்பங்கள், மடல்கள் எழுதச்செய்தல்	தமிழ் இலக்கிய வரலாறு
		Instructional Hours	**12 Hours**
Suggested Learning Methods : குழு விவாதம்			
		Total Hours	**60 Hours**

Text Books	1. இளங்கலை முதலாம் ஆண்டுத்தமிழ் மாணவர்களுக்குரிய பாடநூல் "பைந்தமிழ்" தொகுப்பு: தமிழ்த்துறை, நேரு கலை மற்றும் அறிவியல் கல்லூரி, கோயம்புத்தூர்.
Reference Books	1. திருமந்திரம் - மாணிக்கவாசகர் அருளிய திருவாசகம் - சித்தாந்த பண்டிதர் திரு.ப.இராமநாத பிள்ளை விளக்க உரையுடன் கழக வெளியீடு, திருநெல்வேலி, 2. தமிழண்ணல - புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு, மீனாட்சிப் புத்தக நிலையம் மதுரை.
Web. URLs	https://youtu.be/cL89sSZq_FI

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Seminar	Assignment	Group Project	Total
4	4	5	2	2	3	20

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	L	H	L	H	H	M	H	L	L	L	L	L
CO2	H	L	M	L	H	L	H	H	L	L	L	L	L
CO3	H	L	L	L	M	M	H	H	L	L	L	L	L
CO4	H	L	H	L	H	M	M	L	L	L	L	L	L
CO5	H	L	H	L	H	L	H	H	L	L	L	L	L

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Dr. S. Satheesh kumar	Dr. A.Sridevi

Course Code	Title		
23U1HIN202	Part - 1 Sanchar Hindi (संचार हिन्दी)		
Semester: II	Credits: 3	CIA: 20 Marks	ESE: 55 Marks
(Common to all UG Programmes)			
Course Objective	पाठ्यक्रम संवादी हिंदी में पारंगत होने में मदद करता हैI		
Course Category	Skill Development		
Development Needs	National		
Course Description	Improves Reading and Translation Skills.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	कविता की मूल शब्दावली और व्यावहारिक तत्वों को समझें। मुक्त छंद और कविता के पारंपरिक रूपों में अंतर्निहित सामान्य तकनीकों को समझें।	Lecture / Video Methods	Assignment
CO 2	छात्र विभिन्न प्रकार की संवादात्मक स्थितियों में हिंदी में प्रदर्शित करने, चित्रित करने, नाटक करने और व्याख्या करने के लिए अर्जित कौशल को लागू करने में सक्षम होंगे	Case Studies	Group Project
CO 3	छात्र औपचारिक और अनौपचारिक पत्र लिखने में सक्षम होंगे।	Lectures / Video Lessons	Seminar
CO 4	अनुवाद सभी लोगों के बीच प्रभावी संचार को सक्षम बनाता है।	Lecture / Video Methods	Assignment
CO 5	छात्र हिंदी भाषा के वक्ता के साथ किसी भी सामान्य विषय पर विभिन्न स्तरों पर बातचीत करने में सक्षम होंगे I	Lecture / Dumb Charades	Seminar

Offered by	Hindi

Course Content	Instructional Hours / Week : 4

Unit	Description	Text Book	Chapters
I	आधुनिक हिंदी काव्य : रश्मिरथी , रामधारी सिंह 'दिनकर'	1	All
		Instructional Hours	**12**
Suggested Learning Methods : Visual Learning			**02 Hrs**
II	**एकांकी संग्रह** : 1. **शिवाजी का सच्चा स्वरूप** - सेठ गोविंददास 2. औरंगजेब की आखिरी रात - रामकुमार वर्मा 3. रीढ़ की हड्डी - जगदीशचंद्र माथुर 4. सिपाही की माँ - मोहन राकेश	1	1 to 4
		Instructional Hours	**12**
Suggested Learning Methods : Auditory			**02 Hrs**
III	पत्र लेखन : (छुटटी पत्र , संपादक को पत्र , पुस्तकों के लिए आदेश पत्र , नौकरी के लिए आवेदन पत्र , निजी पत्र)	1	1,2,3
		Instructional Hours	**12**

Suggested Learning Methods : Comprehensive writing			**02 Hrs**
IV	**अनुवाद : हिंदी से अंग्रेजी (अनुवाद अभ्यास** - 3) 1 - 10 passages	3	1,2
		Instructional Hours	**12**
Suggested Learning Methods : Auditory, Visual			**02 Hrs**
V	बोलचाल की हिन्दी : 1. शिक्षक - विद्यार्थी 2. ग्राहक-दुकानदार 3. डॉक्टर - रोगी, 4. साक्षात्कार 5. दो यात्री 6. माँ - बेटा	5	1,2
		Instructional Hours	**12**
Suggested Learning Methods : Comprehensive writing			**02 Hrs**
		Total Hours	**60**

Reference Books	1. रश्मिरथी / रामधारी सिंह "दिनकर" - कविता कोश 2. सरस एकांकी नाटक : डॉ. रामकुमार वर्मा 3. अनुवाद अभ्यास - 3 दक्षिण भारत हिंदी प्रचार सभा , चेन्नई -1
Reference Books	1. श्रेष्ठ हिन्दी एकांकी -डॉ विजयपाल सिंह 2. बोलचाल : पं० अयोध्या सिंह उपाध्याय 3. हिंदी व्याकरण निबंध और पत्र लेखन -डॉ. एन. एल. माथुर
Web. URLs	**www.webdunia.com**

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assign ment	Seminar	Group project	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	H	H	M	L	M	L	M	**L**	**L**	**L**	**L**	**L**
CO2	M	L	H	L	H	H	H	L	**L**	**L**	**L**	**L**	**L**
CO3	H	L	L	L	M	H	M	H	**L**	**L**	**L**	**L**	**L**
CO4	H	M	M	M	L	L	L	H	**L**	**L**	**L**	**L**	**L**
CO5	M	H	L	M	M	M	M	M	**L**	**L**	**L**	**L**	**L**

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Dr. S.Swarnalatha	**Dr.S.Swarnalatha**

Course Code			
23U1MAL202	**Part – I: Novalum Bhashaapadanavum** (നോവലും ഭാഷാപഠനവും)		
Semester: II	**Credits: 3**	**CIA: 20 Marks**	**ESE: 55 Marks**

(Common to all UG Programmes)

Course Objective	വിദ്യാർത്ഥികളിൽ മലയാള ഭാഷയുടെ വികാസവും മലയാള സാഹിത്യത്തിൽ നോവലുകൾക്കുള്ള സ്ഥാനവും വായനാശീലവും വർദ്ധിപ്പിക്കുന്നു
Course Category	Skill Development
Development Needs	Regional
Course Description	Proper guidance, opportunities and encouragement that help them to achieve their ambitions

Course Outcomes		**Teaching Methods**	**Assessment Methods**
CO 1	സമൂഹത്തിലെ ഒരു വിഭാഗത്തിന്റെ ജീവിതം	Lecture / Video Methods	Assignment
CO 2	പ്രകൃതിയുടെയും മറ്റു ജീവജാലങ്ങളുടെയും മാറ്റങ്ങൾ	Case studies	Group Project
CO 3	പ്രകൃതി നാശത്തിനെതിരായി ഒന്നിച്ചു പ്രവർത്തിക്കുന്നു	Lectures / Video Lessons	Seminar
CO 4	സമൂഹത്തിലെ ഭാഷാസങ്കല്പം തിരിച്ചറിയുന്നു	Lecture / Video Methods	Assignment
CO 5	നല്ല ഭാഷ എങ്ങനെ സൃഷ്ടിക്കാമെന്ന് മനസ്സിലാക്കുന്നു	Lecture / Dumb Charades	Seminar

Offered by	**Malayalam**

Course Content	**Instructional Hours / Week : 4**

Unit	**Description**	**Text Book**	**Chapters**
I	നോവൽ - എൻമകജെ	1	1 to 16
		Instructional Hours	**12**
Suggested Learning Methods : Visual Learning			**02 Hrs**
II	നോവൽ - എൻമകജെ	1	17 to 34
		Instructional Hours	**12**
Suggested Learning Methods : Auditory Method			**02 Hrs**
III	നോവൽ - എൻമകജെ	1	35 to 51
		Instructional Hours	**12**
Suggested Learning Methods : Comprehensive Writing			**02 Hrs**
IV	ഭാഷാപഠനം - തെളിമലയാളം	1	1,2,3
		Instructional Hours	**12**
Suggested Learning Methods : Auditory &Visual Method			**02 Hrs**

V	ഭാഷാപഠനം - തെളിമലയാളം	1	4,5
		Instructional Hours	**12**
Suggested Learning Methods : Comprehensive Writing			**02 Hrs**
		Total Hours	**60 Hrs**

Text Books	1. അംബികാസുതൻ മാങ്ങാട്, എൻമകജെ - ഡി.സി.ബുക്സ് കോട്ടയം 2. എം.എൻ.കാരശ്ശേരി, തെളിമലയാളം - ഡി.സി.ബുക്സ് കോട്ടയം
Reference Books	1. പ്രൊഫ.എൻ.കൃഷ്ണപ്പിള്ള, കൈരളിയുടെ കഥ - ഡി.സി.ബുക്സ് കോട്ടയം 2. ഡോ. പന്മന രാമചന്ദ്രൻ നായർ, സമ്പൂർണ്ണമലയാള സാഹിത്യ ചരിത്രം - ഡി.സി.ബുക്സ് കോട്ടയം 3. ഡോ.കെ.എം. ജോർജ്ജ്, ആധുനിക മലയാള സാഹിത്യ ചരിത്രം പ്രസ്ഥാനങ്ങളിലൂടെ - ഡി.സി.ബുക്സ് കോട്ടയം 4. എരുമേലി, മലയാള സാഹിത്യം കാലഘട്ടത്തിലൂടെ - ഡി.സി.ബുക്സ് കോട്ടയം
Web. URLs	**http://www.keralaculture.org>literature** **http://www.manoramaonline.com**

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Group project	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	L	H	H	H	H	H	H	L	L	L	L	L
CO2	H	L	H	M	H	M	H	H	L	L	L	L	L
CO3	M	L	M	M	M	H	H	M	L	L	L	L	L
CO4	H	L	L	H	L	H	H	H	L	L	L	L	L
CO5	M	L	L	M	L	H	H	H	L	L	L	L	L

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Ms. N. RAJANI	Dr. SMITHA C. R.

Course Code	Title		
23U1FRN202	Part – I : Le Français Fondamental – II		
Semester : II	Credits : 3	CIA : 20 Marks	ESE : 55 Marks
(Common to all UG Programmes)			
Course Objective	This course is comprised of deep study of grammar categories and aims to apply the grammatical structures correctly.		
Course Category	Skill Development		
Development Needs	Global		
Course Description	This course aims to develop communicative competence of the students in French, to create cultural awareness, to promote autonomy in learning French.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Acquire an understanding of French culture, use the basic foundation of verbs.	Lecture	Assignment
CO 2	Describe a place, learn pronom en, y and adjectives.	Tutorial / Case Studies	Seminar
CO 3	Recall the tenses and learn Imparfait tense	Lectures / Video Lessons	Quiz
CO 4	Write about the weather and learn pronom COD,	Word game / Lecture	Assignment
CO 5	Write short passages and translate, Comprehend the passage and learn pronom COI	Lecture	Group project

Offered by	Department of French

Course Content	Instructional Hours / Week : 4

Unit	Description	Text Book	Chapters
I	Goûter à la campagne	1	5
	Instructional Hours		**12**
Suggested Learning Methods: Worksheets, TV5 App			
II	Voyager dans sa ville	1	6
	Instructional Hours		**12**
Suggested Learning Methods: Kahoot App, Duolingo			
III	Faire du neuf avec du vieux	1	7
	Instructional Hours		**12**
Suggested Learning Methods : Comprehensive Writing			

IV	Changer d'air	1	8
		Instructional Hours	**12**
Suggested Learning Methods : Comprehensive Writing			
V	Devenir éco-citoyen	1	9
		Instructional Hours	**12**
Suggested Learning Methods : Translating simple sentences and short passages			
		Total Hours	**60**

Text Books	Saison 1 Méthode de Français – Marie-Noëlle Cocton, Anouchka De Oliveira, Dorothée Dupleix (Unit 5 to 9)
Reference Books	A1 Echo Méthode de Français
Web. URLs	Lingua.com, TV 5 app, Learn French by podcast (spotify)

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	-	-	H	M	H	H	-	-	-	-	-	-	-
CO2	-	-	H	L	H	M	-	-	-	-	-	-	-
CO3	-	-	-	M	M	H	-	-	-	-	-	-	-
CO4	-	-	L	M	L	H	-	-	-	-	-	-	-
CO5	-	-	L	-	H	-	-	-	-	-	-	-	-

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
D. Balaji	D. Balaji

Course Code	Title		
23U2ENG202	Part – II : Professional English – II		
Semester : II	Credits : 3	CIA : 20 Marks	ESE : 55 Marks
(Common to all UG Programmes)			
Course Objective	To equip the students with the language skills and its functional usage. Facilitate the insight and taste of Literature.		
Course Category	Skill Development		
Development Needs	Global		
Course Description	SD: Helps to develop LSRW skill		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Mastering life skills through prose discourse.	Lecture/Tutorial	Assignment
CO 2	Acquire ethics and values through poetic genre.	Lecture/Tutorial	Assignment
CO 3	Recognise the nuances of English language through short stories.	Lecture/Tutorial	Speaking
CO 4	Enhance fluency over language with self-confidence.	Lecture/Tutorial	Reading
CO 5	Examine how the language is used in literature and develop LSRW Skills	Lecture/Tutorial	Writing

Offered by	Department of English

Course Content — **Instructional Hours / Week : 4**

Unit	Description	Text Book	Chapters
I	**Prose** E.M. Forster - Tolerance Mahatma Gandhi - Women Not the Weaker Sex Issac Asimov - The Fun They had **Listening Activity** – Comprehension practice from Prose.	1	1-3
		Instructional Hours	**12**
Suggested Learning Methods : Cooperative Learning			
II	**Poetry** Robert Frost - Stopping by Woods on a Snowy Evening William Blake - A Poison Tree Alexander Pope – Ode on Solitude **Speaking Activity** – Group Discussion Forum	1	4-6
		Instructional Hours	**12**
Suggested Learning Methods : Inquiry Based Learning			
III	**Short Stories** Mark Twain - The Cat and the Painkiller Japanese Folk Tale - The Envious Neighbour Hector Hugh Munro (Saki) – The Open Window **Reading Activity** – Pronunciation practice and enhancement from Short-stories	1	7-9
		Instructional Hours	**12**
Suggested Learning Methods : Classroom Activity			

IV	**Grammar** Articles Concord Active and Passive Voices Direct and Indirect Speech **Writing Activity** – Paragraph Writing using grammar Components	1	10-13
		Instructional Hours	**12**
Suggested Learning Methods : Direct Method			
V	**Writing Skills** Resume Writing Email Writing Dialogue Writing Testimonial Writing Creative Writing	1	14-17
		Instructional Hours	**12**
Suggested Learning Methods : Activity Based Learning			
		Total Hours	**60**

Text Books	Compiled by the Department of English NASC.
Reference Books	CLIL (Content & Language Integrated Learning) – Module by TANSCHE NOTE: (Text: Prescribed chapters or pages will be given to the students by the department and the college)
Web. URLs	

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Speaking	Reading	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	L	H	L	M	M	H	M	H	H	M	H	M
CO2	M	L	H	L	H	M	H	M	H	H	M	H	M
CO3	M	L	H	L	H	H	H	H	H	H	M	H	M
CO4	M	L	H	L	H	L	H	H	H	H	M	H	H
CO5	H	M	H	L	H	H	H	H	H	H	H	H	M

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
D Pradeek	Dr. R Malathi

Course Code	Title		
23U3CKC203	Core Paper IV: Java Programming		
Semester: II	Credits: 4	CIA:25 Marks	ESE: 75 Marks
(Common to B. Sc. CS / DS / IT)			
Course Objective	To gain knowledge about basic Java language syntax and semantics to write java programs and understand the principles of classes, methods, inheritance, polymorphism and packages.		
Course Category	Employability		
Development Needs	Global		
Course Description	To understand the Object-Oriented Paradigm and develop programs using Control statements, arrays, packages and interfaces, Exception Handling, multithreading and Develop networking applications		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Remember the fundamental concepts of Object-Oriented Programming.	Lecture	Class Participation
CO 2	Develop simple Java programs with Control statements and arrays.	Constructivist Approach	Quiz
CO 3	Apply the principles of packages and interfaces.	Tutorial	Seminar
CO 4	Design Java application using the concepts of Exception Handling and Multithreading.	Video Lessons	Seminar
CO 5	Develop applications using IO Streams and AWT.	Lecture	Assignment

Offered by	Computer Science

Course Content	Instructional Hours / Week : 5

Unit	Description	Text Book	Chapters
I	**Fundamentals of Object-Oriented Programming:** Object-Oriented Paradigm – Basic Concepts of Object-Oriented Programming – Benefits of Object-Oriented Programming – Application of Object-Oriented Programming. **Java Evolution:** History – Features – How Java differs from C and C++ – Java and Internet – Java and www –Web Browsers. **Overview of Java:** simple Java program – Structure – Java Tokens – Statements – Java Virtual Machine-Command Line Arguments.	1	1,2
		Instructional Hours	**15**
Suggested Learning Methods: **Video lectures about the basics of JAVA Programming**			
II	Constants, Variables, Data Types, Operators and Expressions, **Decision Making and Branching:** if, if...else, nested if, switch, ? : Operator, **Decision Making and Looping:** while, do, for – Jumps in Loops - Labelled Loops, Classes, Objects and Methods. **Arrays:** One Dimensional Array-Creating an Array-Two Dimensional Array.	1 2	4,5,6,7 & 8

		Instructional Hours	15
Suggested Learning Methods: Code Debugging			
III	**Interfaces: Multiple Interface-**Introduction-Defining Interface-Extending Interface-Implementing Interface-Accessing Interface Variables. **Packages:** Introduction-Java API Packages-Using System Packages-Naming Conventions-Creating Packages-Accessing a Package-Using a Package-Adding a Class to a Package-Hiding Classes-Static Import.	1	10,11 & 12
		Instructional Hours	15
Suggested Learning Methods : Simple Application Development			
IV	**Exception Handling:** Fundamentals-Hierarchy of the Exception Classes- Types of Exception –Exception Class-Uncaught Exceptions-Handling Exception-User Defined Exception. **Multithreaded Programming:** The Java Thread Model-Concept of Thread-Runnable Interface-Thread Class-Thread Creation-Thread's Life Cycle-Thread Scheduling-Synchronization and Deadlock-Inter Thread Communication-Joining Threads-Suspending, Resuming and Stopping Threads-JDBC.	2	10 & 11
		Instructional Hours	15
Suggested Learning Methods : Apply the programs in the JAVA Software			
V	**Input/Output Classes:** Input and Output Operations-Hierarchy of Classes in java.io Package-File Class-InputStream and OutputStream Classes-FileInputStream and FileOutputStream Classes-Reader and Writer Classes-RandomAccessFile Class-Stream Tokenizer. **Applets:** Applet Basics-Applet Life Cycle-Running Applets-Methods of the Applet Class-Graphics Class-Color Class-Font Class-Limitations of Applets. **Abstract Window Toolkit:** AWT-AWT Classes-Hierarchy of Classes in Java.awt Package-Control Fundamentals-Component Class-Basic Component Classes-Container Class.-Various Container Class.	2	16,18& 19
		Instructional Hours	15
Suggested Learning Methods : Simple Application Development			
		Total Hours	75Hrs

Text Books	1. E. Balagurusamy, **Programming with Java – A Primer**, Tata McGraw Hill Publication, 3rd Edition, 2007 2. ISRD Group, **Introduction to Object Oriented Programming Through Java**, Tata McGraw Hill Publication, Forth Reprint 2008. 3. Java Network Programming, 4th Edition,Orielly Publication
Reference Books	1. Patrick Naughton& Hebert Schildt, **The Complete Reference Java 2,** Tata McGraw Hill Publication**,** 3rdEdition, 2002 2. John R. Hubbard, **Programming with Java**, Tata McGraw Hill Publication, 2nd Edition, 2009
Web. URLs	https://www.w3schools.com/java/default.asp

Tools for Assessment (25 Marks)													
CIA I		**CIA II**		**CIA III**		**Class Participation**		**Assignment**		**Seminar**		**Total**	
5		**5**		**6**		**3**		**3**		**3**		**25**	
Mapping													
CO \ PO	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PSO1**	**PSO2**	**PSO3**	**PSO4**	**PSO5**
CO1	H	H	-	M	H	-	M	H	H	H	H	M	M
CO2	H	H	-	M	H	-	M	H	H	H	H	M	M
CO3	H	H	-	M	H	-	M	H	H	H	H	H	H
CO4	H	H	-	M	H	-	M	H	H	H	H	H	H
CO5	H	H	-	M	H	-	M	H	H	H	H	H	H
H-High; M-Medium; L-Low													
Course designed by						**Verified by Chairman**							
Dr.Juliet Rozario						Dr.N.Kavitha							

Course Code	Title		
23U3CJC203	Core Paper V - Operating Systems		
Semester: II	Credits: 4	CIA: 25 Marks	ESE: 75 Marks
Common to DCFS & CS (DS)			
Course Objective	To understand the importance of Operating Systems, its functionalities to manage resources of Computer and Peripherals.		
Course Category	Employability		
Development Needs	Global		
Course Description	Every digital device needs its own operating system and functional framework, there is an ever-growing demand globally for operating system developers, software developers and engineers who can innovate new applications with interactive and user-friendly design and databases.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Remember the fundamentals of Operating system	Flipped Classroom	Assignment
CO 2	Understand the scheduling mechanism for process and memory	Constructivist Approach	Seminar
CO 3	Apply the techniques to manage the deadlock and memory	Video Lessons	Quiz
CO 4	Examine demand paging and page replacement policies	Video Lessons	Assignment
CO 5	Analyse the various types of operating System and file system	Case Study	Seminar

Offered by	DCFS

Course Content	Instructional Hours / Week : 5

Unit	Description	Text Book	Chapters
I	**Introduction:** Abstract views of an OS – Goals of an OS – OS and the Computer System – Classes of Operating System: Batch Processing systems – Multiprogramming systems – Time sharing systems – Real Time Operating System – Distributed Operating System – Modern Operating systems	1	1,2
		Instructional Hours	15
Suggested Learning Methods : Seminar Preparation and Presentation			
II	Processes and Programs – Programmer View of Process – OS view of Process – Controlling Processes – Process State Transitions – Process Control Block – Process Scheduling: Scheduling Concepts and Terminology – Fundamental Techniques of scheduling – Non Preemptive scheduling policies - Preemptive scheduling policies.	1	3,4
		Instructional Hours	15
Suggested Learning Methods : Quiz Participation			

III	Deadlock: Definition – Deadlocks in Resource Allocation – Handling deadlocks – Deadlock Detection and Resolution - Deadlock Prevention – Deadlock Avoidance. Memory Management: Static and dynamic Memory Allocation – The Memory Allocation Model – reuse of Memory – Contiguous Memory allocation – Non Contiguous Memory Allocation.	1	11
		Instructional Hours	15
Suggested Learning Methods : Assignment			
IV	Paging – Segmentation – Segmentation with Paging. Virtual Memory: Basics – Demand Paging – Overview of Paging – Demand Paging preliminaries – Page replacement policies – Virtual Memory using Segmentation	1	12
		Instructional Hours	15
Suggested Learning Methods : Assignment			
V	Layers of the Input Output Control System (IOCS) – Overview of I/O Organization – Disk Scheduling. File systems: File System and IOCS – Files and File Operations – Fundamental File organizations – directory Structures – Case study on LINUX OS ,UNIX OS, Android OS (Self Study)	1	14
		Instructional Hours	15
Suggested Learning Methods : Seminar			
		Total Hours	75 Hrs

Text Books	1. D. M. Dhamdhere, Operating Systems – A concept Based Approach, 2nd Edition,2006
Reference Books	**1.** William Stallings, **Operating Systems Internals and Design Principles**, Seventh Edition, Pearson Education Inc. 2012. 2. Abraham Silberchatz, Peter Baer Galvin, Greg Gagne, **Operating System Concepts**,Seventh Edition, Pearson Education 2009.
Web. URLs	

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
5	5	6	3	3	3	25

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	L	M	M	L	M	M	H	H	M	M
CO2	M	M	M	M	H	M	M	M	H	H	H	M	H
CO3	H	L	M	H	M	M	L	H	M	H	H	M	M
CO4	M	H	L	M	L	L	H	M	H	M	H	H	M
CO5	M	M	H	H	M	H	M	H	H	H	M	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Dr. T. Ramaprabha	Dr. J. Maria Shyla

Course Code	Title		
23U3DTP202	Core Paper VI : Practical in Java Programming		
Semester: II	Credits: 4	CIA: 40 Marks	ESE:60 Marks

Course Objective	To enable the students to develop problem solving skills and programming ability in Java
Course Category	Skill Development
Development Needs	Global
Course Description	Develop simple and complex applications at Global needs.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Develop programs to iimplement the string, array and multiple inheritance concepts.	Program Demonstration	Program Creativity
CO 2	Implement the multithreading, exception handling concepts to solve real world problems	Program Demonstration	Debugging
CO 3	Apply the concept of package to illustrate reusability.	Program Demonstration	Application of Logic
CO 4	Develop the programs for the concepts of Applets and AWT.	Program Demonstration	Program Development
CO 5	Create application for file handling.	Program Demonstration	Program Development

Offered by	**Computer Science(Data Science)**
Course Content	**Instructional Hours / Week : 5**

Program List

1. Write a Java Program to implement Quick Sort Algorithm
2. Write a java program to perform Linear and Binary Search
3. Write a Java Program to implement Stack and Queue Operations
4. Write a Java Applications to extract a portion of a character string and print the extracted string
5. Write a Java program to insert an element (specific position) into an array.
6. Write a Java Program to implement the concept of multiple inheritance using Interfaces
7. Write a program to implement the concept of Exception Handling using predefined exception.
8. Write a Java Program to implement the concept of multithreading with the use of any three multiplication tables and assign three different priorities to them
9. Write a Java program to import classes from user defined package and creating package.

10. Write a Java program for using Graphics class to display basic shapes and fill them, - draw different items using basic shapes, set background and foreground colours.
11. Write a Java Program to create a frame with four text field's name, street, city and pin code with suitable tables. Also add a button called my details. When the button is clicked its corresponding values are to be appeared in the text fields
12. Write a Java program of database connectivity using JDBC-ODBC drivers

Suggested Learning Methods:	**Simple Application development**	
	Total Hours	75 Hrs

Tools for Assessment (40 Marks)

Application of Logic	e- Program Creativity	e- Program Debugging	Test 1	Test 2	Observation Note Book	Total
5	5	5	10	10	5	40

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	L	M	H	L	M	H	H	H	H	M	M
CO2	H	H	L	M	H	L	M	H	H	H	H	M	M
CO3	H	H	L	M	H	L	M	H	H	H	H	H	H
CO4	H	H	L	M	H	L	M	H	H	H	H	H	H
CO5	H	H	L	M	H	L	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by
Dr. JULIET ROZARIO	Dr. N. KAVITHA

Course Code	Title		
23U3MIA202	Allied Paper II : Discrete Mathematics		
Semester: II	Credits: 4	CIA: 25 Marks	ESE: 75 Marks
(Common to B. Sc. CS,IT,DS,AIML,DCFS and BCA)			
Course Objective	To learn about the Discrete Structure for Computer Based Application.		
Course Category	Skill Development		
Development Needs	Regional		
Course Description	This course is to understand and use abstract discrete structures that are backbones of Computer Science. In particular, this course meant to introduce logic, proofs, sets, relations, functions, counting, and graph with an emphasis on applications in Computer Science.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Learn the basic concepts of Set theory	Lectures / Peer Teaching	Assignment
CO 2	Implement the basic ideas of Mathematical Logic in Computer Science	Lectures / Tutorial	Seminar
CO 3	Classify different types of Relations and Functions	Lectures / Video Lectures	Assignment
CO 4	Infer the concepts of Grammar and Automata theory.	Lectures / Tutorial	Work Sheet
CO 5	Know the concepts of Graph theory	Lectures / Video Lectures	Quiz

Offered by	Mathematics

Course Content	Instructional Hours / Week : 5

Unit	Description	Text Book	Chapters
I	**Set Theory:** Introduction- Set & its Elements-Set Description-Types of sets-Venn-Euler Diagrams-Set operations & Laws of set theory. Fundamental products- Partitions of sets – Minsets- Algebra of sets and Duality-Inclusion and Exclusion Principle	1	1
		Instructional Hours	15
Suggested Learning Methods: Problem Solving Practice			**02 Hrs**
II	**Mathematical Logic:** Introduction- prepositional calculus – Basic logical operations- Tautologies-Contradiction – Argument-PDNF & PCNF - Method of proof.	1	12
		Instructional Hours	15
Suggested Learning Methods : https://youtu.be/tyDKR4FG3Yw			**02 Hrs**
III	**Relations:** Binary Relations – Set operation on relations-Types of Relations – Partial order relation – Equivalence relation – Composition of relations. Functions – Types of functions – Invertible functions – Composition of functions.	1	3,4
		Instructional Hours	15
Suggested Learning Methods : Assignments			**02 Hrs**

IV	**Languages:** Operations on languages – Regular Expressions and regular languages. **Grammar:** Types of grammars – Grammar Construction-Finite state machine – Finite State Automata- DFA- NDFA- Conversion of NDFA into DFA.	1	15
		Instructional Hours	**15**
Suggested Learning Methods : Problem Solving Practice			**02 Hrs**
V	**Graph Theory:** Basic terminology – paths, cycle & Connectivity – Sub graphs – Types of graphs. Trees – Properties of trees – Binary trees -Traversal of Binary Trees.	1	9,10
		Instructional Hours	**15**
Suggested Learning Methods: Problem Solving Practice			**02 Hrs**
		Total Hours	**75 Hrs**

Text Books	1. J.K. Sharma, **Discrete Mathematics**, Macmillan India Ltd, 2nd edition, 2005. Unit – 1 : Chapter 1 - Section:1.1- 1.7, 1.9,1.10,1.12, 1.14 ; Page No : 1-16,18,19,22-27,32-36 Unit – 2 : Chapter 12 - Section:12.1-12.3,12.8,12.9, 12.11,12.12; Page No:333-341,352-354,356-361 Unit – 3 : Chapter 3 - Section : 3.3-3.7, 3.11; Page No:77-85,92-93 Chapter 4 – Section: 4.1 - 4.5; Page No: 99-108 Unit – 4 : Chapter 15 – Section 15.3 - 15.7; Page No:443-477 Unit – 5 : Chapter 9 – Section 9.1-9.5 ; Page No: 221-239 Chapter 10 – Section 10.1-10.3, 10.6; Page No:268-274,278-282 2. J.P.Tremblay & R.Manohar , **Discrete Mathematical Structures with Applications to Computer Science,** Tata McGraw Hill Publication, 1997 Unit – 2 : Chapter 1 – Page No : 52-58
Reference Books	**1.** J. P. Tremblay, R. Manohar, **Discrete Mathematics Structures with Applications to Computer Science**, McGraw Hill International Edition, 2005. 2. T.Veerarajan, **Discrete Mathematics with Graph Theory and Combinatories**, McGraw Hill International Edition, 2008
Web. URLs	1. https://www.youtube.com/watch?v=oaOm2pnKkyY 2. https://youtu.be/tyDKR4FG3Yw

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
5	5	6	3	3	3	25

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	L	M	H	M	M	L	L	M	H	L	l
CO2	H	H	L	M	H	M	M	L	L	M	H	L	M
CO3	H	H	L	M	H	M	M	L	M	L	H	L	H
CO4	H	H	L	M	M	M	M	L	M	M	K	L	H
CO5	H	H	L	H	M	M	M	L	L	L	H	M	H

H-High; M-Medium; L-Low

Course designed by	Verified by
S. RUTH KETHSIAL	Dr. T. CHANDRAPUSHPAM

Course Code	Title	
21U4HRC202	Ability Enhancement Compulsory Course - Human Rights and Constitution of India	
Semester : II	Credits : 2	CIA : 50 Marks

(Common to all UG Programmes)

Course Objective:

Understand the concept of human rights and the importance of Indian Constitution.

Course Outcomes:

CO1	Understand the principal aspects of human rights and duties in a broad sweep.
CO2	Acquire the knowledge about the Fundamental Duties and Rights of Indian Citizen
CO3	To know the rights of women and Children in India
CO4	Understand the structure and importance of Indian Constitution
CO5	Know the functions of Government and Election Commission of India

Course Content **Instructional Hours / Week : 2**

Unit	Description	
I	An Introduction to Human Rights :Values – Dignity, Liberty, Equality, Justice, Unity in Diversity - Human Rights – Meaning and features; Significance of the study - Classification of Human Rights - Rights and Duties – Correlation	
	Instructional Hours	**6**
II	Human Rights and Fundamental Rights - Fundamental Rights and Fundamental Duties- Directive Principles - Role of Judiciary in the protection of Human Rights- National Human Rights Commission *Activity : Case Study related to Human Rights*	
	Instructional Hours	**6**
III	Human Rights of Women and Children- Social Practice and Constitutional Safeguards– Female foeticide and infanticide-Physical assault and Harassment- Domestic violence- Conditions of Working Women *Activity : Conduct a Group Discussion on the above topics*	
	Instructional Hours	**6**
IV	**Constitution – Structure and Principles -** Meaning and importance of Constitution - Making of Indian Constitution –Sources - Salient features of Indian Constitution- Government of Union- Government of State-Features of judicial system in India	
	Instructional Hours	**6**
V	Federalism in India – Features - Local Government -Panchayat –Powers and functions -Election Commission –Organisation and functions-Citizen oriented measures – RTI – Provisions and significance *Activity : Seminar/ Role play related to Indian Constitution*	
	Instructional Hours	**6**
	Total Hours	**30**

Text Book:

1. **"Human Rights and Constitution of India",** Complied by Curriculum Development Cell, Nehru Artsand Science College.

Tools for Assessment (50 Marks)

Case Study and Report submission	Seminar / Role play	Group Discussion	Comprehensive test for 5×5 = 25 marks	Total
10	10	5	25	50

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	-	-	-	L	H	H	H	H	L	L	-	-	-
CO2	-	-	-	L	H	H	H	H	L	L	-	-	-
CO3	-	-	-	L	H	H	H	H	L	L	-	-	-
CO4	-	-	-	L	H	H	H	H	L	L	-	-	-
CO5	-	-	-	L	H	H	H	H	L	L	-	-	-

H-High; M-Medium; L-Low

Course Designed by	Verified by
Dr. E Vijaya Gowri	Dr. N. Saranya

Course Code	Title	
22U4HVY201	Value Education : Human Values and Yoga Practice	
Semesters : I & II	Credits : 2	CIA : 50 Marks

(Common to all UG Programmes)

Course Objective:

- To help the students appreciate the essential complementarity between 'values' and 'skills' to ensure sustained happiness and prosperity, which are the core aspirations of all humanbeings.
- To prepare and distribute standardized Yoga teaching and training material with reference to institutehealth**.**

Course Outcomes:

CO1	To know the importance of Ethics to be followed in the Human life.
CO2	To inculcate a sense of respect towards harnessing values of life and spiritof fulfilling social responsibilities.
CO3	To gain knowledge about the values that develops life skills.
CO4	To understand and Practice Meditation & Surya Namaskar.
CO5	To understand and apply the knowledge for physical health and well being through Asanas

CourseContent **Instructional Hours / Week : 1 (For Semesters I andII)**

Unit	Description
I	**Human Values –** Introduction - Definition of Ethics and Values - Character and Conduct - Nature and Scope of Ethics. **Individual and Society -** Theories of Society-Social Relationships and Society - Empathy: Compassion towards other beings.
	Instructional Hours 4
II	**Self-realization and Human Values-**Self-realization and Harmony-Rules and Regulations-Rights and Duties-Good and Obligation-Integrity and Conscience. **Obligation to Family-**Trust and Respect-Codes of Conduct.
	Instructional Hours 5
III	**Character Formation Towards Positive Personality**: Truthfulness, Constructivity, Sacrifice, Sincerity, Self Control, Altruism, Tolerance, Scientific Vision. **Refinement of worries**: Neutralization of anger-Intelligent quotient(IQ),Emotional quotient(EQ),Spiritual Quotient (SQ)
	Instructional Hours 5
IV	**Power of Meditation-** Development of mind in stages - Mental Frequencies Methods for Concentration. Meditation Practices - Surya Namaskar. Physical Exercises -Kayakalpa Practices Training for Potentialising the Mind.
	Instructional Hours 6

V	**ASANAS** **Standing Posture:** Tadasana, Utkattasana, arthaKadi Chakrasana, Trikonasana, Artha Chandrarasana, Padahastasana, Virabhadrasana, Vrikshasana, Artha, Natarajasana. **Sitting posture:** Padmasana, Gomukasana, Ustrasana, ArdhaMatsyendrasana, Patchimottanasana. **Prone posture:**Bhujangasana, shalabhasana, Dhanurasana, Chakrasana. **Supine posture:**Sarvangasana, Halasana, Matsyasana, Shanti asana **Pranayama:** Bhastrika, Bhramari, NadiShodhan	
	Instructional Hours	**10**
	Total Hours	**30**

Text book:

1. **"Value Education",** compiled by Curriculum Development cell, Nehru Arts and Science College.

Tools for Assessment

25 marks	25 marks
Comprehensive test in Units I to III for 25 marks during CIA III of Sem. II	Perform 02 Yoga postures for Practical exam to be conducted during the mid. of Sem. II

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	-	-	-	H	L	M	H	H	-	L	-	-	L
CO2	-	-	-	L	M	H	M	H	-	L	-	-	L
CO3	-	-	-	L	M	H	S	H	-	L	-	-	L
CO4	-	-	-	L	L	H	M	H	-	L	-	-	L
CO5	-	-	-	L	L	H	M	H	-	L	-	-	L

H-High; M-Medium;L-Low

Course designed by	Verified by Chairman
Karthi M	Dr. N Kavitha

Course Code	Title		
23U1TAM303	Part -I : Arunthamizh (அருந்தமிழ்)		
Semester: III	Credits: 3	CIA: 20 Marks	ESE: 55 Marks

Course Objective	தமிழ்க் காப்பியங்களின் வழி அறம் சார்ந்த சிந்தனைகளை உருவாக்குதல்
Course Category	**Skill Development (**மாணவர்களின் மொழித்திறனை ஊக்குவித்தல்)
Development Needs	**Global/Regional (**உலக அளவில் தமிழ் மொழியின் அவசியத்தை உணர்த்துதல்**)**
Course Description	மாணவர்களின் மொழித்திறனை ஊக்குவித்தல் மற்றும் உலக அளவில் தமிழ் மொழியின் அவசியத்தை உணர்த்துதல்

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	தமிழ் நூல்களில் அணிநலம் அறிதல், அறம் சார்ந்த சிந்தனைகளை வளர்த்தல்.	விரிவுரை/ காணொளிப்பட விளக்கம்	ஒப்படைவு
CO 2	தமிழ் இலக்கிய வகைகளைக் கூறுவதன் மூலம் தமிழின் இலக்கிய வளத்தை உணரச்செய்தல்.	விரிவுரை	குழுத்திட்டம்
CO 3	மாணவர்களிடையே காலத்திற்கேற்ப மொழிவளர்ச்சியை உருவாக்குதல்.	விரிவுரை/ காணொளிப்பட விளக்கம்	ஒப்படைவு
CO 4	நாட்டின் சிறந்த குடிமக்களாக மாணவர்களை உருவாக்குதல்.	விரிவுரை// குழு விவாதம்	கருத்தரங்கு
CO 5	மாணவர்களின் மனநலத்தை வளர்த்தல்.	விரிவுரை/ குழு விவாதம்	கருத்தரங்கு

Offered by தமிழ்த்துறை

Course Content : Arunthamizh (அருந்தமிழ்) — **Instructional Hours / Week : 4**

Unit	Description	Text Book	Chapters
I	காப்பியங்கள்	1.சிலப்பதிகாரம் 2.மணிமேகலை 3.சீவகசிந்தாமணி 4.கம்பராமாயணம்	1.1அடைக்கலக்காதை (மதுரைக்காண்டம்-பகுதி- 15) 1.2.பீடிகைக் கண்டுபிறப்புணர்ந்தக் காதை-பகுதி-9) 1.3.பூமகள் இலம்பகம் (பகுதி- 11-2347-2377 பாடல்கள்) 1.4சுந்தரகாண்டம்(கடல் தாவுப்படலம் 1-10பாடல்கள்)
		Instructional Hours	**12 Hours**
Suggested Learning Methods: நாடக முறையில் கலந்துரையாடல்			
II	சைவ,வைணவ, சுவடியியல்	1. தேவாரம் 2..நாலாயிரத்திவ்வியப் பிரபந்தம் 3.சுவடியியல்	2.1.திருநல்லூர்ப் பெருமணம் (பாடல் எண்-4137-4146) 2.2.ஆண்டாள் திருப்பாவை - (பாடல் எண்- 474-483) 2.3.சுவடியியல் - அறிமுகம் 2.4 சைவம் தமிழுக்குச் செய்த தொண்டு 2.5 வைணவம் தமிழுக்குச் செய்த தொண்டு
		Instructional Hours	**12 Hours**
Suggested Learning Methods : பக்தி பாசுரங்கள் கலந்துரையாடல்			

III	மொழித்திறன் (இலக்கணம்)	1.நன்னூல் 2.தொல்காப்பியம்	3.1 நூல் வரலாறு (முதல் நூல், வழி நூல், சார்பு நூல்) 3.2 மாணாக்கர் வரலாறு 3.3 ஆசிரியர் வரலாறு 3.4 எண்வகை மெய்ப்பாடுகள்
Instructional Hours			**12 Hours**
Suggested Learning Methods :	மொழித்திறன் வாயிலாக பிழையின்றி எழுதும் திறன் பெற்றமை		
IV	நாட்டுப்புற வழக்காறுகள்	நாட்டுப்புறவியல்	4.1. பழமொழிகள் 4.2. விடுகதைகள் 4.3 தமிழர்க்கலைகள் 4.4 சிறுதெய்வ வழிபாடு மட்டும் 4.5 விளையாட்டுகள் (சிறுவர்,சிறுமியர் மட்டும்)
Instructional Hours			**12 Hours**
Suggested Learning Methods :	நாட்டுப்புறவியல் வழி நாட்டுப்புற மக்களின் வாழ்வியலை அறியச்செய்தல்		
V	இலக்கிய வரலாற்றுத் திறன்	தமிழ் இலக்கிய வரலாறு	1. காப்பியத்தின் தோற்றமும் வளர்ச்சியும் 2. பக்தி இலக்கியத்தின் தோற்றமும் வளர்ச்சியும் 3. தமிழக நாட்டுப்புறவியல் வரலாறு
Instructional Hours			**12 Hours**
Suggested Learning Methods:	பாடத்திட்டத்தில் கொடுக்கப்பட்டுள்ள இலக்கிய வரலாற்றினை உணர்த்துதல்		
Total Hours			**60 Hours**
Text Books	இளங்கலை இரண்டாம் ஆண்டு தமிழ் மாணவர்களுக்குரிய பாடநூல் **"அருந்தமிம்"** தொகுப்பு: தமிழ்த்துறை, நேரு கலை மற்றும் அறிவியல் கல்லூரி, கோயம்புத்தூர்.		
Reference Books	நாட்டுப்புறவியல் ஓர் ஆய்வு: டாக்டர் சு. சக்திவேல் விஜயா பதிப்பகம் சென்னை. தமிழண்ணல் - புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு, மீனாட்சிப் புத்தக நிலையம், மதுரை- 625 001.		
Web. URLs	https://youtu.be/EJcYgyw7e94, https://youtu.be/MgtwmerI4yw		

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Seminar	Assignment	Group Project	Total
4	4	5	2	2	3	20

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	L	H	L	L	H	M	L	L	L	L	L	L
CO2	M	L	H	L	H	L	M	H	L	L	L	L	L
CO3	H	L	L	L	H	M	H	M	L	L	L	L	L
CO4	M	L	H	L	M	M	H	L	L	L	L	L	L
CO5	H	L	M	L	H	L	M	H	L	L	L	L	L

H-High; M-Medium; L-Low

Course designed by	Verified by
Dr. S. Satheesh Kumar	Dr. A. Sridevi

Course Code	Title		
23U1HIN303	Part I - Sahityak Hindi (साहित्यिक हिंदी)		
Semester: III	Credits: 3	CIA: 20 Marks	ESE: 55 Marks

(Common to all UG Programmes)

Course Objective	चुनिंदा कविताओं के माध्यम से हिंदी कविता की उत्पत्ति और विकास को समझना।. संकलन में उपलब्ध कराए गए सर्वोत्तम नमूनों का उपयोग करते हुए कविता की सराहना।
Course Category	Skill Development
Development Needs	National
Course Description	Improves Writing Skills.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	छात्र हिंदी भाषा से अच्छी तरह वाकिफ हो सकेंगे।	Role play	Assignment
CO 2	व्यक्तिगत अनुभवों की पहचान करें जिनका उपयोग कविताएँ लिखते समय किया जा सकता है।	Group learning Acting	Seminar
CO 3	कविता की मूल शब्दावली और व्यावहारिक तत्वों को समझें।	Story Narration	Assignment
CO 4	छात्रों को रचनात्मक लेखन में अच्छा अभ्यास मिलेगा।	Group learning and Work sheets	Group Project
CO 5	पाठ्यक्रम संवादी हिंदी में पारंगत होने में मदद करता है।	Worksheets and Exercises	Seminar

Offered by	**Hindi**

Course Content	**Instructional Hours / Week : 4**

Unit	Description	Text Book	Chapters
I	नाटक – सत्यमेव जयते – (श्री सूर्यनारायण मूर्ति)	1	3
		Instructional Hours	**12**
Suggested Learning Methods : Visual Learning			**02 Hrs**
II	प्राचीन काव्य : कबीर के दोहे (10 दोहा), सूरदास के पद (4 पद) (काव्य तरंग)	1	2
		Instructional Hours	**12**
Suggested Learning Methods : Auditory			**02 Hrs**
III	1.आधुनिक काव्य : पुष्प की अभिलाषा– माखनलाल चतुर्वेदी, जलियांवाला बाग़ में बसंत – सुभद्राकुमारी चौहान, शक्ति और क्षमा – रामधारी सिंह दिनकर 2.संक्षिप्तीकरण	1	3
		Instructional Hours	**12**
Suggested Learning Methods : Comprehensive Writing			**02 Hrs**
IV	**अलंकार** : 1) **अर्थ अलंकार** और **शब्द अलंकार**, 2) **दिए गए चित्र पर कुछ वाक्य लिखना ।**	1	2
		Instructional Hours	**12**
Suggested Learning Methods : Auditory, Visual, Comprehensive			**02 Hrs**

V	गद्यांश लेखन, वाक्य शुद्धि, शब्द शुद्धि, अनेक शब्द के लिए एक शब्द	1	4
		Instructional Hours	**12**
Suggested Learning Methods : comprehensive writing			**02 Hrs**
		Total Hours	**60 Hrs**

Text Books	**1. नाटक – सत्यमेव जयते – (श्री सूर्यनारायण मूर्ति)** 2. काव्य सुमन - राजपाल एंड सन्स
Reference Books	1. हिंदी नाटक और रंगमंच - डॉ राम कुमार वर्मा 2. ओंकार नाथ वर्मा , सामान्य हिंदी अरिहंत प्रकाशन इंडिया लिमिटेड
Web. URLs	1. www.webdunia.com 2. https://www.hindikunj.com 3. www.bhashaindia 4. www.hindisamay.com

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Group Project	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	M	M	L	H	M	L				
CO2	H	H	H	L	L	H	M	H	L	L	L	L	L
CO3	L	M	L	L	M	H	M	L	L	L	L	L	L
CO4	M	M	M	M	H	L	L	L	L	L	L	L	L
CO5	M	L	L	M	H	L	L	H	L	L	L	L	L

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Dr.S.Swarnalatha	Dr.S.Swarnalatha

Course Code	Title		
23U1MAL303	**Part - I : Kavithayum Smaranayum** (കവിതയും സ്മരണയും)		
Semester: III	**Credits: 3**	**CIA: 20 Marks**	**ESE: 55 Marks**
(Common to all UG Programmes)			
Course Objective	കവിതാ സാഹിത്യ പരിചയത്തോടൊപ്പം പുതു കവിതകളെ കുറിച്ച് അവബോധവും ആസ്വാദനവും ഉയർത്തുക. വിദ്യാർത്ഥികൾക്ക് മാതൃകയാവുന്ന സമൂഹത്തിലെ ഉന്നത വ്യക്തിത്വങ്ങളെ പരിചയപ്പെടുത്തുക		
Course Category	Skill Development		
Development Needs	Regional		
Course Description	Developing Personality and Self confidence		

Course Outcomes		**Assessment Methods**	**Assessment Methods**
CO 1	കവിതയിലൂടെയുള്ള സംവേദനം	Smart boards/ Chalk and Talk	Assignment
CO 2	പ്രകൃതിയുടെ നിസ്വാർത്ഥമായ പ്രവർത്തനങ്ങൾ	Group learning	Seminar
CO 3	അധ്യാപക വിഭാഗത്തിനിടയിൽ അവകാശ ബോധം ഉണ്ടാക്കുന്നു	Peer Teaching	Assignment
CO 4	സമൂഹത്തിന് മൂല്യബോധമുണ്ടാക്കുന്ന പ്രവർത്തനങ്ങൾ	Group learning	Group Project
CO 5	സമൂഹത്തിൽ അധ്യാപനത്തിന്റെ പ്രാധാന്യം	Smart boards/ Chalk and Talk	Assignment

Offered by	**Malayalam**

Course Content	**Instructional Hours / Week : 4**

Unit	**Description**	**Text Book**	**Chapters**
I	നവീന കവിത - പുതു കവിതകൾ	1	4
		Instructional Hours	**12**
Suggested Learning Methods : Visual Learning			**02 Hrs**
II	നവീന കവിത - പുതു കവിതകൾ	1	3
		Instructional Hours	**12**
Suggested Learning Methods : Auditory Method			**02 Hrs**
III	കണ്ണീരും കിനാവും - വി.ടി.ഭട്ടതിരിപ്പാട്	1	3
		Instructional Hours	**12**
Suggested Learning Methods : : Comprehensive writing			**02 Hrs**
IV	കണ്ടൽക്കാടുകൾക്കിടയിൽ എന്റെ ജീവിതം - കല്ലേൻ പൊക്കുടൻ	1	2
		Instructional Hours	**12**
Suggested Learning Methods: Auditory &Visual Methods			**02 Hrs**
V	കണ്ടൽക്കാടുകൾക്കിടയിൽ എന്റെ ജീവിതം - കല്ലേൻ പൊക്കുടൻ	1	3
		Instructional Hours	**12**
Suggested Learning Methods : Comprehensive Writing			**02 Hrs**
		Total Hours	**60 Hrs**

Text Books	1. നവീന കവിത (പുതു കവിതകൾ) - നെഹ്റു കോളെജ് മലയാള വിഭാഗം എഡിറ്റു ചെയ്ത 10 കവിതകൾ . 2. കണ്ണീരും കിനാവും - വി.ടി.ഭട്ടതിരിപ്പാട് -ഡി.സി. ബുക്ക്സ്

	3. കണ്ടൽകാടുകൾക്കിടയിൽ എന്റെ ജീവിതം - കല്ലേൻ പൊക്കുടൻ - ഗ്രീൻ ബുക്ക്സ്
Reference Books	1. മലയാള കവിതാപഠനങ്ങൾ - സച്ചിദാനന്ദൻ ,മാതൃഭൂമി ബുക്സ്, കോഴിക്കോട് 2. കവിതാ സാഹിത്യ ചരിത്രം - ഡോ.എം.ലീലാവതി കേരള സാഹിത്യ അക്കാദമി, തൃശൂർ 3. ആധുനികത മലയാള കവിതയിൽ എൻ. അജയകുമാർ , പഠനസംഘം, ചങ്ങനാശ്ശേരി 4. സാഹിത്യം മലയാളത്തിൽ ആത്മകഥ - നടുവട്ടം ഗോപാലകൃഷ്ണൻ , ഭാഷാ ഇൻസ്റ്റിറ്റ്യൂട്ട് , തിരുവനന്തപുരം
Web. URLs :	**http://www.keralaculture.org>literature**

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	L	H	M	H	H	H	H	L	L	L	L	L
CO2	M	L	H	L	H	M	H	H	L	L	L	L	L
CO3	H	L	L	M	M	H	M	H	L	L	L	L	L
CO4	M	L	L	M	L	H	H	M	L	L	L	L	L
CO5	M	L	L	M	H	L	H	M	L	L	L	L	L

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Ms.RAJANI N.	Dr. SMITHA C.R.

Course Code	Title		
23U1FRN303	Part – I : Le Francais General – III		
Semester : III	Credits : 3	CIA : 20 Marks	ESE : 55 Marks
(Common to all UG Programmes)			
Course Objective	Acquisition of standard French by knowing more about the culture.		
Course Category	Skill Development		
Development Needs	Global		
Course Description	Improved understanding and communication		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Learn about the other French speaking nations, hobbies,	Lectures/ Tutorial	Assignment
CO 2	Le passé compose, l'imparfait	Group Learning	Assignment
CO 3	Social network, les indicateurs de temps	Peer Teaching	Seminar
CO 4	Le discours direct et indirect	Video Lecture / Lectures	Group Project
CO 5	To learn to answer questions orally in French	Group learning	Assignment

Offered by Department of French

Course Content — **Instructional Hours / Week : 4**

Unit	Description	Text Book	Chapters
I	La langue francaise en action	1	1
		Instructional Hours	12
Suggested Learning Methods : Visuals			
II	Aller a la rencontre des autres	1	2
		Instructional Hours	12
Suggested Learning Methods : Group discussions			
III	Enrichir son reseau	1	3
		Instructional Hours	12
Suggested Learning Methods : Group discussions			
IV	Vivre l'information	1	4
		Instructional Hours	12
Suggested Learning Methods : Visuals			
V	Interroger le passe	1	5
		Instructional Hours	12
Suggested Learning Methods : Comprehensive writing			
		Total Hours	60

Text Books	1. Saison 2 Méthode de Français – Marie-Noëlle Cocton, Anouchka De Oliveira, Dorothée Dupleix (Unit 0 to 4)
Reference Books	1. Connexions 2 Methode de Français Régine Mérieux , Yves Loiseau
Web. URLs	1. www.academia.edu

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	-	-	H	M	H	H	-	-	-	-	-	-	-
CO2	-	-	H	L	H	M	-	-	-	-	-	-	-
CO3	-	-	-	M	M	H	-	-	-	-	-	-	-
CO4	-	-	L	M	L	H	-	-	-	-	-	-	-
CO5	-	-	L	-	H	-	-	-	-	-	-	-	-

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
D Balaji	D Balaji

Course Code	Title		
23U2ENG303	Part – II : Communicative English – I		
Semester : III	Credits : 3	CIA : 20 Marks	ESE : 55 Marks
(Common to All UG Programmes)			
Course Objective	To enable the students to learn the different genres of literature and gain a better understanding of the English language.		
Course Category	Skill Development		
Development Needs	Global		
Course Description	SD: Helps to develop LSRW skill		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Execute moral, ethical and literary merits and relate it to the society.	Lecture/Tutorial	Assignment
CO 2	Exhibit a comprehensive knowledge of poetry and execute life skills and human values through it.	Lecture/Tutorial	Assignment
CO 3	Develop reading strategies with enriched vocabulary, through short story.	Lecture/Tutorial	Speaking
CO 4	Identify the use of English language through the study of Grammar and use them in specific contexts.	Lecture/Tutorial	Reading
CO 5	Interpret their understanding of English works in LSRW mode	Lecture/Tutorial	Writing

Offered by | **Department of English**

Course Content | **Instructional Hours / Week : 4**

Unit	Description	Text Book	Chapters
I	**Prose** J.B. Priestley - Travel by Train R.K. Narayan - Headache E.M. Forster - Tolerance	1	1 - 3
		Instructional Hours	**12**
Suggested Learning Methods : Intensive Reading			
II	**Poetry** William Blake - The School Boy Rudyard Kipling - If Sarojini Naidu - The Queen's Rival	1	4 - 6
		Instructional Hours	**12**
Suggested Learning Methods : Scaffolding Method			
III	**Short Stories** O. Henry - After Twenty Years Edgar Allan Poe – Tell - Tale Heart Frank R.Stockton - The Lady or The Tiger?	1	7 - 9
		Instructional Hours	**12**
Suggested Learning Methods : Flipped Learning			

IV	Herman Melville-Moby Dick (Abridged Version)	1	10 - 13
		Instructional Hours	**12**
Suggested Learning Methods : Flipped Learning			
V	**Oral & Written Communication (UnitI–IV) Listening** – Comprehension practice from Poetry, Prose, Online Voice Practice, observing / viewing E-content (with subtitles), Guest / Invited Lectures, Conference/ Seminar Presentations & Tests, and DD National News Live, BBC, CNN, VOA etc **Speaking** – In Group Discussion Forum, participate in the Turn Taking, and Conversation Management, Debating, Defending / Mock Viva Voce, Seminar Presentations on Classroom-Assignments, and Peer-Team-interactions. **Reading**–Different Reading Strategies in Poetry, Prose, Novel, Newspaper etc **Writing** – Modals, Concord, E-Mail & Report Writing, Spotting the Errors and How to avoid them, Sentence Completion, Prepositions, Idioms and Phrases, Collocation.	1	14 - 17
		Instructional Hours	**12**
Suggested Learning Methods : Activity Based Learning			
		Total Hours	**60**

Text Books	Unit I–V: Compiled by the Department of English
Reference Books	CLIL (Content & Language Integrated Learning) – Module by TANSCHE NOTE:(Text: Prescribed chapters or pages will be given to the students by the department
Web. URLs	

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Speaking	Reading	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	-	H	-	M	M	H	M	H	H	M	H	M
CO2	M	-	H	-	H	M	H	M	H	H	M	H	M
CO3	M	-	H	-	H	H	H	H	H	H	M	H	M
CO4	M	L	H	-	H	-	H	H	H	H	M	H	H
CO5	H	M	H	-	H	H	H	H	H	H	H	H	M

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Dr Adappatu Ancy Antony	Dr R Malathi

Course Code	Title		
23U3DTC303	Core Paper VII: Introduction to Data Science		
Semester: III	Credits: 3	CIA:20 Marks	ESE: 55 Marks
Course Objective	To learn the basic concepts of Machine Learning, Data Science and Data Analysis		
Course Category	Employability		
Development Needs	Global		
Course Description	Data Science is a blend of mathematics, business acumen, tools, algorithms and machine learning techniques to find out the hidden insights or patterns from raw data .		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand and comprehend the basics of machine learning	Flipped Classroom	Assignment
CO 2	Improve the proficiency with statistical analysis of data	Tutorial	Seminar
CO 3	Apply data science concepts and methods to solve problems in real-world contexts	Lecture	Quiz
CO 4	Understands the concepts of social media analytics	Case Study	Seminar
CO 5	Develop real-world applications using data visualization	Lecture	Program Execution

Offered by	Computer Science(Data Science)
Course Content	Instructional Hours / Week : 4

Unit	Description	Text Book	Chapters
I	Introduction: Introduction to Data Science, Big Data and Data Science hype and getting past the hype. Datafication, Current landscape of perspectives, Skill sets needed, Statistical Inference, Populations and samples, Statistical modeling, probability distributions, Introduction to R	1	1
		Instructional Hours	12
Suggested Learning Methods : Video lectures			
II	Exploratory Data Analysis and the Data Science Process, Basic tools (plots, graphs and summary statistics) of EDA, Philosophy of EDA, The Data Science Process Case Study: RealDirect (online real estate _rm), Three Basic Machine Learning Algorithms, Linear Regression, k-Nearest Neighbors (kNN), k-means	1	3
		Instructional Hours	12
Suggested Learning Methods : Case Study			
III	Additional Machine Learning Algorithm and Usage in Applications, Motivating application: Filtering Spam, Why Linear Regression and k-NN Data Wrangling: APIs and other tools for scrapping the Web, Feature Generation and Feature Selection Extracting Meaning From Data), Motivating application: user (customer) retention, Feature Generation (brainstorming, role of domain expertise, and place for imagination), Feature Selection algorithms,	2	7,8

	Filters; Wrappers; Decision Trees; Random Forests		
		Instructional Hours	**12**
Suggested Learning Methods : Group Discussion			
IV	Recommendation Systems: Building a User-Facing Data Product, Algorithmic ingredients of a Recommendation Engine, Dimensionality Reduction, Singular Value Decomposition, Principal Component Analysis, Exercise: build your own recommendation system, Mining Social-Network Graphs, Social networks as graphs, Clustering of graphs, Direct discovery of communities in graphs, Partitioning of graphs, Neighborhood properties in graphs.	2	9,12
		Instructional Hours	**12**
Suggested Learning Methods : Assignment			
V	Data Visualization, Basic principles, ideas and tools for data visualization, Examples of inspiring (industry) projects. Exercise: create your own visualization of a complex dataset, Data Science and Ethical Issues, Discussions on privacy, security, ethics. A look back at Data Science, Next-generation data scientists.	3	13
		Instructional Hours	**12**
Suggested Learning Methods : Assignment			
		Total Hours	**60 Hrs**

Text Books	1. Cathy O'Neil and Rachel Schutt. Doing Data Science, Straight Talk From The Frontline. O'Reilly. 2014. 2. Jure Leskovek, Anand Rajaraman and Je_rey Ullman. Mining of Massive Datasets. v2.1, Cambridge University Press. 2014. (free online) 3. Kevin P. Murphy. Machine Learning: A Probabilistic Perspective. ISBN 0262018020. 2013.
Web. URLs	https://www.w3schools.com/datascience/

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	M	M	M	L	M	H	H	H	H	M	M
CO2	H	H	M	M	M	L	M	H	H	H	H	M	M
CO3	H	H	M	M	M	L	M	H	H	H	H	H	H
CO4	H	H	M	M	M	L	M	H	H	H	H	H	H
CO5	H	H	M	M	M	L	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by
D. J. ANITHA MERLIN	Dr. N. KAVITHA

Course Code	Title		
23U3DTC304	Core Paper VIII: RDBMS and MySQL		
Semester: III	Credits: 3	CIA:20 Marks	ESE: 55 Marks
Course Objective	To inculcate fundamental knowledge in RDBMS concepts and designed for writing SQL queries using MySQL.		
Course Category	Employability		
Development Needs	Global		
Course Description	This course includes the fundamentals concepts of DBMS, Data Models, ER Diagrams and MySQL.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	List and explain the fundamental concepts of a relational database system	Lecture	Assignment
CO 2	Explain the basic concepts of relational data model, entity-relationship model and relational database design	Tutorial	Seminar
CO 3	Improve the database design by normalization	Lecture	Quiz
CO 4	Understanding of SQL syntax used with MySQL	Flipped Classroom	Program Execution
CO 5	Explain the basic functions of MySQL database program	Video Lessons	Program Execution

Offered by Computer Science(Data Science)

Course Content — **Instructional Hours / Week : 3**

Unit	Description	Text Book	Chapters
I	**Introduction:** Introduction to DBMS – Information-Data and Data Management-File-based data management – Database System - DBMS - Components of a DBMS- Database User- Database Architecture and Design- Data Abstraction - Physical and Logical Data Independence	1	1
		Instructional Hours	**9**
Suggested Learning Methods : Video lectures			
II	**Data Models:** Data Models-Introduction-Conceptual, Physical Models-Hierarchical Model - Network Model-Relational Model – E-R Model **Entity – Relationship (E-R) Modeling:** Introduction – E-R Model - Components of an E-R Model-Relationships- Relationships, E-R conventions- Composite Entities - Entity List-E-R diagrams, E-R Modeling Symbols	1	3
		Instructional Hours	9
Suggested Learning Methods : Drawing ER Diagram			
III	**Data Integrity, Constraints and Normalization:** Introduction-Integrity Constrains - Normalization-Keys-Relationships-Normalization - Keys-Relationships-First Normal Form(1NF)-Second Normal form(2NF) -Third Normal Form(3NF)- Boyce-Codd Normal Form (BCNF)	1	7,8
		Instructional Hours	9

Suggested Learning Methods : Group Discussion			
IV	**AMySQL:** Introduction to MySQL - Identifier in MySQL - Creating a Database - Selecting Database-Creating Tables-Data Types in in MySQL-Using INSERT-Using DELETE-Using Truncate - Using Update-Overview of SELECT - Simple Queries - Selecting Particular Column - Using WHERE Clause to Select particular Rows-Using GROUPBY Clause -HAVING - ORDER BY – LIMIT.	2	9,12
		Instructional Hours	9
Suggested Learning Methods : Practical Demo			
V	**MySQL Queries and Functions:** Using Joins to Run Queries over Multiple table-Understanding the different Join Types-Operator in My SQL-Control Flow functions-String Functions-Numeric Function-Date and Time Functions **PL/SQL Concepts :** Cursors, Stored Procedures, Database Triggers	2	13
		Instructional Hours	9
Suggested Learning Methods : Laboratory practice			
		Total Hours	45 Hrs

Text Books	1. Alexis Leon and Mathews Leon 'Fundamentals of database Management Systems', Vijay Nicole Imprints Private Limited, Chennai,2006. 2. Luke Welling and Laura Thomson, 'My SQL Tutorial', Pearson Education, First Edition,2006.
Reference Books	1. Abraham Silberschatz , Henry F.Korth and S.Sudarshan,'Database System Concepts', Tata Mc Graw Hill,Sixth Edition,2013. 2. C.J.Date, A.Kannan and S.Swamynathan, 'An Introduction to Database Systems', Eight Edition, Pearson Education, 2006. 3. Hugh E. Williams, Saied M.M. Tahaghoghi ,'Learning MySQL',O'Reilly Media, Inc ,Second Edition ,2006.

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	L	M	H	L	M	H	H	H	H	M	M
CO2	H	H	L	M	H	L	M	H	H	H	H	M	M
CO3	H	H	L	M	H	L	M	H	H	H	H	H	H
CO4	H	H	L	M	H	L	M	H	H	H	H	H	H
CO5	H	H	L	M	H	L	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by
Dr. D. VIMAL KUMAR	Dr. N. KAVITHA

Course Code	Title		
23U3DTP305	Core Paper IX Practical in RDBMS and MySQL		
Semester: III	Credits: 3	CIA: 30 Marks	ESE:45 Marks

Course Objective	To make the students to understand Relational Database Management System concepts using Oracle and able to do the various operations on Tables.
Course Category	Employability
Development Needs	Global
Course Description	This course introduces queries to insert data, update, delete and fetch the data from the tables. Merging of tables, using aggregate functions, clauses to filter and sort the data.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Remember to transform an information model into a relational database schema and to use a data definition language and/or utilities to implement the schema using a RDBMS.	Program Demonstration	Program Creativity
CO 2	Understand the processes of Database Development and Administration using SQL and PL/SQL.	Program Demonstration	Debugging
CO 3	Apply the Programming and Software Engineering skills and techniques using SQL.	Program Demonstration	Application of Logic
CO 4	Analyze the relational data model with optimal and feasible solutions	Program Demonstration	Program Development
CO 5	Evaluate the Optimal Solutions	Program Demonstration	Program Development

Offered by	**Computer Science(Data Science)**
Course Content	**Instructional Hours / Week : 3**

Program List

1. Create a table for Employee details with Employee Number as primary key and following fields: Name, Designation, Gender, Age, Date of Joining and Salary. Insert at least ten rows and perform various queries using any one Comparison, Logical, Set, Sorting and Grouping operators.
2. Create tables for library management system which demonstrate the use of primary key and foreign key. Master table should have the following fields: Accno, Title, Author and Rate. Transaction table should have the following fields: User id, Accno, Date of Issue and Date of Return. Create a Report(Select verb) with fields Accno, Title, Date of Issue for the given Date of Return with column formats.
3. Write a PL/SQL to update the rate field by 20% more than the current rate in inventory table which has the following fields: Prono, ProName and Rate. After updating the table a new field (Alter) called for Number of item and place for values for the new field without using PL/SQL block.
4. Write a PL/SQL program to check whether given string is palindrome or not

5. Write a PL/SQL program to find factorial of numbers using function and procedure.
6. Create a PL/SQL Program to perform updation using various triggers.
7. Create a database trigger to implement on master and transaction tables which are based on inventory management system for checking data validity. Assume the necessary fields for both tables.
8. Write a PL/SQL to split the student table into two tables based on result (One table for -Pass and another for -Fail). Use cursor for handling records of student table.
9. Write a PL/SQL to raise the exceptions in Bank Account Management table
10. Write a PL/SQL to handle package
11. Write a PL/SQL Cursor for referencing fields in a record
12. Write a PL/SQL trigger for entering mark in the student table

Total Hours	45 Hrs

Tools for Assessment (30 Marks)

Laboratory Performance- Application of Logic	Laboratory Performance- Program Creativity	Laboratory Performance- Program Debugging	Test 1	Test 2	Observation Note Book	Total
4	4	4	7	7	4	30

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	L	M	H	L	M	H	H	H	H	M	M
CO2	H	H	L	M	H	L	M	H	H	H	H	M	M
CO3	H	H	L	M	H	L	M	H	H	H	H	H	H
CO4	H	H	L	M	H	L	M	H	H	H	H	H	H
CO5	H	H	L	M	H	L	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by
Dr. D. VIMAL KUMAR	Dr. N. KAVITHA

Course Code	Title		
23U3MKA303	**Allied Paper III: Probability Distributions and Inferential Statistics**		
Semester: III	**Credits : 4**	**CIA: 25 Marks**	**ESE: 75 Marks**

Course Objective	To enable the students to learn and visualize the nature of the probability distributions and the concept of estimation and their properties.
Course Category	Skill Development
Development Needs	Global
Course Description	It deals with establishing whether differences or associations exist between sets of data and enable us to obtain estimates the variability of occurrence.

Course Outcomes		**Teaching Methods**	**Assessment Methods**
CO 1	Memorizing the concepts of Binomial and Poisson distributions	Lecture	Assignment
CO 2	Discussing the moment generating functions of Normal distribution	Tutorial	Unit Test
CO 3	Classifying the theory of Statistical Inference	Lecture	Seminar
CO 4	Explaining the parameters of Point estimation	Lecture	Assignment
CO 5	Experimenting the test for statistical hypothesis.	Lecture	Quiz

Offered by | **Mathematics**

Course Content | **Instructional Hours / Week :4**

Unit	**Description**	**Text Book**	**Chapters**
I	Binomial, Poisson and Negative – Binomial distributions - Moments, MGF, Cumulants, Additive property, Recurrence relation for the probabilities – Simple problems	1	2
		Instructional Hours	**12**
Suggested Learning Methods: Problem solving practice			
II	Normal distribution – Limiting form of Binomial distribution, properties, Median, Mode, Moments, MGF, Cumulants, Mean deviation, Area property, and Simple problems.	1	10
	Rectangular distribution – Moments, MGF, Characteristic function, Mean deviation – Bivariate normal distribution	1	8
		Instructional Hours	**12**
Suggested Learning Methods: Seminar			
III	Concept of Statistical Inference – Parametric estimation – Sampling distribution – Standard Error. Deviation of Standard Error of mean, variance, proportion, difference between mean variances and Proportions – concept of ordered statistics.	1	3
		Instructional Hours	**12**
Suggested Learning Methods : Problem Solving Practice			
IV	Point Estimation : Estimator, Properties of point estimator – Unbiasedness, consistency	1	17
	Crammer Rao inequality – efficiency – Asymptotic efficiency and sufficiency of the estimator – Rao Blackwell theorem	1	6

		Instructional Hours	**12**
Suggested Learning Methods :https://www.youtube.com/watch?v=PpcLCnwBFe0			
V	Statistical Hypothesis: Test of a statistical hypothesis- Power of the test. Likelihood Ratio test: Test for the mean and variance of a normal distribution- Test for the equality of means and variances of two normal populations.	1	18
		Instructional Hours	**12**
Suggested Learning Methods : Problem Solving Practice			
		Total Hours	**60 Hrs**

Text Books	1. S.C.Guptha and V.K. Kapoor, **Fundamentals of Mathematical Statistics**, S.Chand and Sons, Reprint, 2009. Unit I: Sections-8.4,8.4.1, 8.4.6, 8.4.7, 8.4.9, 8.5, 8.5.1, 8.5.2, 8.5.5, 8.5.7, 8.5.8,8.6, 8.6.1,8.6.2 Unit II:Sections - 9.1, 9.2,9.2.1- 9.2.7,9.2.10, 9.2.11 Unit III: Sections - 14.1 – 14.3, 14.3.1,14.3.2,14.8.2 – 14.8.4, 14.8.5 Unit IV:Sections -17.1, 17.2.1 – 17.2.3, 17.3, 17.3.1, 17.5 Unit V : sections – 18.1, 18.2, 18.2.1 -18.2.7, 18.6, 18.6.2,18.6.3
Reference Books	1. P.R. Vittal, **Mathematical statistics**, Margham Publications, Chennai.
Web. URLs	1. https://youtu.be/fuBvQJP0ecw (Statistical Inference – Unit I) 2. https://youtu.be/IhtmW28slDw (Normal Distribution – Unit II) 3. https://youtu.be/x30ht5oPkdU(Parametric Estimation – Unit III) 4. https://youtu.be/L3wQw0wva3g (Sampling Distribution - Unit III) 5. https://youtu.be/ysjkkBspbYY(Point estimation – Unit IV) 6. https://youtu.be/r36L0HpQksA (Point estimation – Unit IV) 7. https://youtu.be/3zW9m0Fhb3M (Crammer Rao inequality- Unit IV) 8. https://youtu.be/F9lk8tlkDXI(Statistical Hypothesis – Unit V) 9. https://youtu.be/BvpeBmHgijk (Standard deviation and Errors) 10. https://www.mygreatlearning.com/blog/inferential-statistics-an-overview/

Tools for Assessment (25 Marks)

CIA I	CIA II	Model	Seminar	Assignment	Periodical Quizzes	Total
5	5	6	3	3	3	25

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	L	M	H	L	M	H	H	H	H	M	M
CO2	H	H	L	H	H	L	M	H	H	H	H	M	M
CO3	M	H	L	M	H	L	M	H	H	H	H	H	H
CO4	M	H	L	M	H	L	H	H	H	H	H	H	H
CO5	H	H	L	M	H	L	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by
P. SHEEBA MAYBELL	Dr. N. KAVITHA

Course Code	Title		
23U4DTZ301	Skill Based Paper I: Practical in Excel Analytics		
Semester: III	Credits: 3	CIA: 30 Marks	ESE:45 Marks

Course Objective	To make the students to understand descriptive, predictive and prescriptive analytics are interrelated, helping companies make the most out of their data.
Course Category	Employability
Development Needs	Global
Course Description	This course makes the students to Understand the different types of analytics techniques, Use advanced sorting for descriptive analysis and Use advanced conditional formatting for descriptive analysis

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand which analytics tools are available in Excel.	Program Demonstration	Program Creativity
CO 2	Use advanced sorting and advanced conditional formatting for descriptive analysis.	Program Demonstration	Debugging
CO 3	Use selected analytics functions such as DSUM, DAVERAGE, DMAX and AGGREGATE.	Program Demonstration	Application of Logic
CO 4	Understand the What-If Analysis Tools and their uses.	Program Demonstration	Program Development
CO 5	Understand the set of statistical analysis tools available in the Excel Analysis Toolpak.	Program Demonstration	Program Development

Offered by	**Computer Science(Data Science)**
Course Content	**Instructional Hours / Week : 4**

Program List

1. Generate a bar chart to visualize sales data across different months.
2. Summarize a large dataset of expenses using pivot tables to show total expenditure by category.
3. Calculate mean, median, and mode for a set of data using Excel functions.
4. Predict future values in a sales dataset using the TREND function.
5. Apply conditional formatting to highlight outliers in a dataset.
6. Construct a sales dashboard with dropdown menus to view different product performances.
7. Create a scatter plot to visualize the relationship between temperature and ice cream sales.

8. Construct a histogram to display the distribution of exam scores in a class.
9. Using Excel's Goal Seek function to find the necessary sales volume to achieve a revenue target.
10. Calculate monthly average temperatures using Excel's AVERAGEIFS function.
11. Setting up data validation rules to restrict input values in a sales order form..
12. Using Excel functions to split full names into first and last names in a dataset

Total Hours	60 Hrs

Tools for Assessment (30 Marks)

Laboratory Performance- Application of Logic	Laboratory Performance- Program Creativity	Laboratory Performance- Program Debugging	Test 1	Test 2	Observation Note Book	Total
4	4	4	7	7	4	30

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	L	M	H	L	M	H	H	H	H	M	M
CO2	H	H	L	M	H	L	M	H	H	H	H	M	M
CO3	H	H	L	M	H	L	M	H	H	H	H	H	H
CO4	H	H	L	M	H	L	M	H	H	H	H	H	H
CO5	H	H	L	M	H	L	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by
Dr. B. NARASIMHAN	Dr. N. KAVITHA

Course Code	Title	
22U4NM3BT1	Part IV : Basic Tamil – I (அடிப்படைத்தமிழ் - I)	
Semester: III	Credits: 2	CIA: 50 Marks

(Common to all UG Programmes)

Course Objective	தமிழ் மொழியைக் கற்பித்தல்–மொழித்திறனை வளர்த்தல்.
Course Category	Skill Development (மாணவர்களின் மொழித்திறனை ஊக்குவித்தல்)
Development Needs	Regional (தமிழ் மொழியின் அவசியத்தை உணர்த்துதல்)
Course Description	மாணவர்களின் மொழித்திறனை ஊக்குவித்தல்

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	தமிழ் எழுத்துக்கள் அறிமுகம் செய்தல் மற்றும் வாசித்தல் ஆகியவற்றின் பயன்பாடு.	குழு விவாதம்	ஒப்படைவு
CO 2	பிறமொழி கற்றல் ஆர்வம் தூண்டல்.	குழு விவாதம்	கருத்தரங்கு
CO 3	பிறமொழி அறிவுத் திறன் மேம்படச்செய்தல	விரிவுரை/ காணொளிப்பட விளக்கம்	குழுத்திட்டம்
CO 4	வார்த்தை அமைக்கும் திறன் பெறச்செய்தல்.	விரிவுரை/ குழு விவாதம்	குழுத்திட்டம்
CO 5	கையெழுத்துத்திறன் பெறச்செய்தல்.	குழு விவாதம்	குழுத்திட்டம்

Offered by தமிழ்த்துறை

Course Content : Basic Tamil – I அடிப்படைத்தமிழ் - I — **Instructional Hours / Week : 2 Hours**

Unit	Description	Text Book	Chapters
I	தமிழ் மொழியின் அடிப்படைக் கூறுகள்	இலக்கணம்	1.உயிர்எழுத்துக்கள் 2.மெய் எழுத்துக்கள் 3.உயிர்மெய் எழுத்துக்கள்
		Instructional Hours	**6 Hours**
Suggested Learning Methods : எழுத்துக்களை எழுதும் மற்றும் வாசிக்கும் திறன் பெற்றமை			
II	சொல் அமைத்தல்	இலக்கணம்	1.ஓர் எழுத்து ஒருமொழி 2.இரண்டுமுதல் ஐந்து எழுத்துச்சொற்கள் 3.தமிழ் மாதங்கள் பெயர்,கிழமைகளின் பெயர் 4.வண்ணங்கள் பெயர், 5.சொல் ஆக்கம்
		Instructional Hours	**6 Hours**
Suggested Learning Methods : எழுத்துக்களை கொண்டு சொற்களை உருவாக்கும் பயிற்சி பெற்றமை			
III	தொடரமைப்பு	தொடரமைப்பு	1.எழுவாய் 2.செயப்படுபொருள்
		Instructional Hours	**6 Hours**
Suggested Learning Methods : சொற்களைக் கொண்டு தொடர் உருவாக்கும் பயிற்சி பெற்றமை			
IV	குறிப்பு எழுதுதல்	இலக்கணம்	1.தொடரமைப்பு 2.பத்தி அமைப்பு
		Instructional Hours	**6 Hours**
Suggested Learning Methods : பத்தி அமைப்பு உருவாக்கும் திறன் பெற்றமை			

V	பிழைநீக்குதல்	இலக்கணம்	1.ஒற்றுப்பிழை 2.வாக்கியப் பிழை
		Instructional Hours	**6 Hours**
Suggested Learning Methods : இலக்கணப் பிழை இன்றி எழுதும் திறன் பெற்றமை			
		Total Hours	**30 Hours**

Text Books	1. இளங்கலை தமிழ் மாணவர்களுக்குரிய பாடநூல்"அரிச்சுவடி" தொகுப்பு: தமிழ்த்துறை,நேரு கலை மற்றும் அறிவியல் கல்லூரி,கோயம்புத்தூர்.
Reference Books	1. பவணந்தி முனிவர்,நன்னூல் பூலியூர்க்கேசிகன் உரை,சாரதா பதிப்பகம், சென்னை–40. 2. தொல்காப்பியம், கணேசையர் பதிப்பு,உலகத் தமிழாராய்ச்சி நிறுவனம், சென்னை -113.
Web. URLs	https://youtu.be/P7vvUnjI6vY, https://youtu.be/Zx4R3yZseuQ.

Tools for Assessment (50 Marks)

CIA I	CIA II	CIA III	Seminar	Assignment	Group Project	Total
8	8	10	8	8	8	50

Mapping

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	L	H	L	H	M	H	H	L	L	L	L	L
CO2	M	L	H	L	M	M	L	H	L	L	L	L	L
CO3	H	L	H	L	L	M	M	H	L	L	L	L	L
CO4	H	L	M	L	L	M	H	M	L	L	L	L	L
CO5	M	L	H	L	M	M	H	H	L	L	L	L	L

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Dr. S. Satheesh kumar	**Dr. A. Sridevi**

Course Code	Title	
22U4NM3AT1	Part IV: Advanced Tamil – I (சிறப்புத்தமிழ் -I)	
Semester: III	Credits: 2	ESE: 50 Marks
Course Objective	புதுக்கவிதை உருவாக்கும் திறன் வளர்த்தல் - மொழித்திறனை மேம்படுத்துதல்	
Course Category	Skill Development (மாணவர்களின் மொழித்திறனை ஊக்குவித்தல்)	
Development Needs	Regional (தமிழ் மொழியின் அவசியத்தை உணர்த்துதல்)	
Course Description	மாணவர்களின் மொழித்திறனை ஊக்குவித்தல்	

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	புதுக்கவிதை படைக்கும் திறன்வளர்த்தல்	விரிவுரை	குழுத்திட்டம்
CO 2	படைப்பாக்கத்திறன் அறிவு பெறச்செய்தல்.	விரிவுரை / குழு விவாதம்	கருத்தரங்கு
CO 3	தகவல் தொடர்பியலுக்கான கடிதம்,அமைவுத்திறன் பெறச்செய்தல்	விரிவுரை / காணொளிப்பட விளக்கம்	கருத்தரங்கு
CO 4	மொழியைப் பிழையின்றிப் பேசும் ,எழுதும் திறன் பெறச் செய்தல்	விரிவுரை	ஒப்படைவு
CO 5	கடிதம் எழுதுதல் மற்றும் மொழியறிவைப் பெறுதல்.	விரிவுரை / காணொளிப்பட விளக்கம்	குழுத்திட்டம்

Offered by	தமிழ்த்துறை

Course Content: Advanced Tamil - I (சிறப்புத்தமிழ் -I)	Instructional Hours / Week : 2 Hours

Unit	Description	Text Book	Chapters
I	புதுக்கவிதை	1. பாரதியார் 2. பாரதிதாசன்	1.1.தேசபக்திபாடல் தாயின் மணிக்கொடி பாரீர் 1.2.பாரதிதாசன்(தமிழ்மொழிபற்று- கனியிடை,தமிழுக்கும் அமுதென்று)
		Instructional Hours	6 Hours
Suggested Learning Methods : கவிதை எழுதும் திறன் பெற்றமை			
II	பிழை நீக்குதல்	இலக்கணம்	2.1.சொற்பிழை நீக்கம் 2.2.தொடர் பிழை நீக்கம் 2.3.பத்தி எழுதச் செய்தல்
		Instructional Hours	6 Hours
Suggested Learning Methods :வாக்கியங்களைப் பிழை இன்றி எழுதும் திறன் பெற்றமை			
III	இலக்கணப் பயிற்சி அளித்தல்	இலக்கணம்	3.1.தொகை நிலைத்தொடர், 3.2.தொகா நிலைத்தொடர் 3.3.ஆகுபெயர் வகைகள்

		Instructional Hours	**6 Hours**
Suggested Learning Methods : இலக்கணப் பிழை இன்றி எழுதும் பயிற்சி பெற்றமை			
IV	கடிதம் எழுதுதல்	இலக்கணப் பயிற்சி ஏடு	4.1. பாராட்டுக்கடிதம் 4.2. நன்றிக்கடிதம் 4.3. அழைப்புக்கடிதம் 4.4. அலுவலகக் கடிதம் 4.5. நட்புக்கடிதம்
		Instructional Hours	**6 Hours**
Suggested Learning Methods : கடிதம் எழுதும் திறன் பெற்றமை			
V	இலக்கிய வரலாறு	தமிழ் இலக்கிய வரலாறு	1.வேலு நாச்சியார் 2.கப்பலோட்டிய தமிழன்
		Instructional Hours	**6 Hours**
Suggested Learning Methods : தமிழ் இலக்கிய வரலாற்றின் சிறப்பினை அறிய பெற்றமை			
		Total Hours	**30 Hours**

Text Books	1. இளங்கலை தமிழ் மாணவர்களுக்குரிய பாட நூல்"திரட்டு"தமிழ்த்துறை. தொகுப்பு: தமிழ்த்துறை,நேரு கலை மற்றும் அறிவியல் கல்லூரி, கோயம்புத்தூர்.
Reference Books	1. பாரதியார்- பாரதியார் கவிதைகள், அபிராமி பதிப்பகம், 7- பி, கொடிமரத் தெரு, சென்னை– 013. 2. பவணந்தி முனிவர் – நன்னூல் புலியூர்க்கேசிகன் உரை, சாரதா பதிப்பகம், சென்னை -040.
Web. URLs	https://youtu.be/xnsvFOHxDeo, https://youtu.be/kQoIj-29VIk.

Course designed by	**Verified by** Chairman
Dr. S. Satheesh kumar	Dr. A. Sridevi

Course Code	Title	
22U4NM3CAF/ 21U4NM3CAF	Non Major Elective : Consumer Affairs	
Semester : III	Credits : 2	ESE : 50 Marks
(Common to all UG Programmes)		
Course Objective	To enable the students to understand the concepts of Consumers and Markets	
Course Category	Employability	
Development Needs	National & Global	

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Know their rights and responsibilities as a consumer	Lecture/ Video Lectures	Assignment
CO 2	Gain knowledge about Consumer protection law in India	Lecture/ Peer Teaching	Seminar
CO 3	Understand the procedure about redressed of consumer complaints	Lecture/ Group Discussion	Seminar
CO 4	Learn about Consumer related regulatory agencies and Norms	Lecture/ Role Play	Assignment
CO 5	Comprehend Business Firms, Interface with Consumers.	Lecture/ Group Discussion	Quiz

Offered by | **Department of Business Administration**

Course Content | **Instructional Hours / Week : 2**

Unit	Description	Text Book	Chapters
I	**Conceptual Framework - Consumer and Markets:** Concept of Consumer, Nature of markets: Liberalization and Globalization of markets with special reference to Indian Consumer Markets, Concept of Price in Retail and Wholesale, Maximum Retail Price (MRP), Fair Price, GST, labelling and packaging along with relevant laws, Legal Metrology. Consumer Complaining Behaviour: Alternatives available to Dissatisfied Consumers; Complaint Handling Process.	1	1 & 2
		Instructional Hours	**6**
Suggested Learning Methods : Video lectures			
II	**The Consumer Protection Law in India** **Objectives and Basic Concepts:** Consumer rights and UN Guidelines on consumer protection, Consumer goods, defect in goods, spurious goods and services, service, deficiency in service, unfair trade practice.	1	5 & 6
		Instructional Hours	**6**
Suggested Learning Methods : Peer Teaching			

III	**Grievance Redressal Mechanism under the Indian Consumer Protection Law** Who can file a complaint? Grounds of filing a complaint; Limitation period; Procedure for filing and hearing of a complaint; Disposal f cases, Relief/Remedy available; Temporary Injunction, Offences and penalties.	2	1
		Instructional Hours	**6**
Suggested Learning Methods : Group Discussion			
IV	**Role of Industry Regulators in Consumer Protection -** Industry self-regulation (ISR) Protection Policies, Consumer Protection Agencies i. Telecommunication: TRAI ii. Food Products: FSSAI Insurance : IRDA and Insurance Ombudsman	2	4
		Instructional Hours	**6**
Suggested Learning Methods : Role Play			
V	**Contemporary Issues in Consumer Affairs** **Consumer Movement in India:** Formation of consumer organizations and their role in consumer protection, Misleading Advertisements and sustainable consumption, National Consumer Helpline, Comparative Product testing. **Quality and Standardization:** Voluntary and Mandatory standards; Role of BIS, Indian Standards Mark (ISI), Ag-mark, Hallmarking, Licensing and Surveillance.	2	6 & 7
		Instructional Hours	**6**
Suggested Learning Methods : Group Discussion			
		Total Hours	**30**

Reference Books	1. Khanna, Sri Ram, Savita Hanspal, Sheetal Kapoor, and H.K. Awasthi. (2007) Consumer Affairs, Universities Press. 2. Choudhary, Ram Naresh Prasad (2005). Consumer Protection Law Provisions and Procedure, Deep and Deep Publications Pvt Ltd.

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	-	-	-	M	H	H	M	M	-	-	-	-
CO2	L	-	-	-	M	H	H	M	M	-	-	-	-
CO3	L	-	-	-	M	H	M	M	M	-	-	-	-
CO4	L	-	-	-	M	H	H	M	M	-	-	-	-
CO5	L	-	-	-	M	H	H	M	M	-	-	-	-

H-High; M-Medium; L-Low

Course designed by	Verified by
Dr. R A Ayyapparajan	Dr. R A Ayyapparajan

Course Code	Title	
22U4NM3GST	Non Major Elective : Gender Sensitization	
Semester : III	Credits : 2	ESE : 50 Marks

(Common to all UG Programmes)

Course Objective	To raise awareness of gender, promote gender equality, and equip learners with key concepts and principles of gender sensitization.
Course Category	Skill Development, Employability and Entrepreneurship
Development Needs	Local, National and Global
Course Description	The course aims an exploration of overview of gender, its social construction, gender issues and challenges in India, and equips learners with key concepts and principles of gender sensitization to promote inclusivity and equity.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Learn gender roles, socialization, and stereotypes.	Direct Instruction	Assignment
CO 2	Recognize the gender discrimination causes, areas, and levels in institutions.	Direct Instruction	Seminar
CO 3	Identify the gender identity formation, types, families, and socialization in India.	Video Lessons	Assignment
CO 4	Understand the gender concerns in access, enrollment, retention, participation, and achievement.	Direct Instruction	Assignment
CO 5	Apply the Laws Related to Women	Direct Instruction	Exhibition

Offered by | **Department of Costume Design and Fashion**

Course Content | **Instructional Hours / Week : 2**

Unit	Description	Text Book	Chapters
I	**Gender Socialisation and Gender Roles:** Introduction- Meaning of Sex and Gender, Gender Socialisation– Definitions, Agents of Gender Socialisation, Gender Roles- Meaning, Definitions, Nature of Gender Roles, Factors Determining Gender Roles/Stereotypes	1	-
		Instructional Hours	**6**
Suggested Learning Methods : Group discussions			
II	**Gender Discrimination:** Gender Discrimination - Meaning and Causes of Gender Discrimination, Areas of Gender Discrimination, Gender Discrimination at Different Levels of Institutions	1	-
		Instructional Hours	**6**
Suggested Learning Methods : Video documentaries and films			
III	**Gender Identity:** Gender Identity - Meaning, Formation and Factors of Gender Identity, Types of Gender Identity, Types of Families in India, Gender Socialisation within Indian Families	1	-
		Instructional Hours	**6**
Suggested Learning Methods : Case Method			

IV	**Gender Concerns:** Gender Concerns Related to Access, Enrolment, Retention, Participation, and Achievement	1	-
		Instructional Hours	**6**
Suggested Learning Methods : Video documentaries and films			
V	**Laws Related to Women:** Laws Related to Rape, Laws Related to Dowry - Dowry Prohibition Act, 1961, Laws Related to Remarriage, Laws Related to Divorce, Laws Related to Property Inheritance, Laws Related to Trafficking, Constitutional and Legal Aspects related to Women - Women's Reservation Bill – History and Current Status	1	-
		Instructional Hours	**6**
Suggested Learning Methods : Case Method			
		Total Hours	**30**

Text Books	1. Gender School and Society : Self-learning Material, MANGALORE UNIVERSITY, Printed at Datacon Technologies, Bangalore, 2018
Reference Books	1. United Nations Development Programme. (2014). Gender Equality and Women's Empowerment: Training Manual. New York: UNDP.
Web. URLs	1. Coursera - https://www.coursera.org/courses?query=gender%20sensitization 2. edX - https://www.edx.org/learn/gender-sensitization 3. Udemy - https://www.udemy.com/topic/gender-sensitization/

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	M	M	M	M	H	H	M	-	-	-	-	-
CO2	H	M	M	M	H	H	M	M	-	-	-	-	-
CO3	H	M	M	M	M	H	H	M	-	-	-	-	-
CO4	H	M	M	M	L	H	H	M	-	-	-	-	-
CO5	H	M	M	M	M	H	M	M	-	-	-	-	-

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
M Nandhini	Dr S Jayapriya

Course Code	Title	
22U4NM3WRT /21U4NM3WRT	Non Major Elective : Women's Rights	
Semester : III	Credits : 2	ESE : 50 Marks
(Common to all UG Programmes)		
Course Objective	To facilitate the awareness about the social, economical, political, intellectual or cultural contributions of Women in India.	
Course Category	Skill Development	
Development Needs	National	
Course Description	Apply the knowledge of Rights related to women for their betterment.	

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Aware of basic constitutional rights	Lecture/ Case Study/ Role Play	Seminar
CO 2	Gain awareness on Political rights	Lecture/ Case Study/ Role Play	Role Play
CO 3	Understand individual and familial rights	Lecture/ Case Study/ Role Play	Role Play
CO 4	Grasp the provisions for Women's Rights in India	Lecture/ Case Study/ Role Play	Role Play
CO 5	Develop an understanding of the Protection Mechanisms for women	Lecture/ Case Study/ Role Play	Assignment

Offered by	Department of Social Work

Course Content	Instructional Hours / Week : 2

Unit	Description	Text Book	Chapters
I	**Constitutional Rights of Women in India**: Indian constitution relating to women - Fundamental rights - Directive principles of state policy - right to equality – rights against exploitation cultural and educational rights - the right to constitutional remedy - University Declaration of Human Rights -Enforcement of Human Rights for Women and Children - Role of Cells and Counseling Centers - Legal AID cells, Help line, State and National level Commission	4	2
		Instructional Hours	**6**
Suggested Learning Methods : Seminar			
II	**Political Rights of Women in India:** Political Rights of Women in India - Electoral process – women as voters - candidates and leader - pressure group, 73rd and 74th amendment and representation of women in local self –government – women in Rural and urban local bodies - Reservation of women - party ideologies and women's issues.	5	1
		Instructional Hours	**6**
Suggested Learning Methods : Role Play			

III	**Women's Rights: Access to Justice:** Introduction – Criminal Law – Crime Against Women Domestic Violence – Dowry Related Harassment and Dowry Deaths - Molestation – Sexual Abuse and Rape Loopholes in Practice–Law Enforcement Agency	3	7
		Instructional Hours	**6**
Suggested Learning Methods : Role Play			
IV	**Women's Rights:** Violence Against Women – Domestic Violence The Protection of Women from Domestic Violence Act 2005, The Marriage Validation Act 1982 - The Hindu Widow Remarriage Act 1856 - The Dowry Prohibition Act 1961.	3	5
		Instructional Hours	**6**
Suggested Learning Methods : Creative Art Assignments			
V	**Special Women Welfare Laws:** Sexual Harassment at Work Places, Rape and Indecent Representation, The Indecent Representation (Prohibition) Act, 1986, Immoral Trafficking, The Immoral Traffic (Prevention) Act, 1956 - Acts Enacted for Women Development and Empowerment, Role of Rape Crisis Centers. Protection of Children from sexual Offences Act 2012.	3	9
		Instructional Hours	**6**
Suggested Learning Methods : Community Participation Program			
		Total Hours	**30**

Reference Books

1. P. D. Kaushik "Women Rights" Book well Publication 2007 UN Centre for Human Rights, Discrimination against Women (Geneva: World Campaign for Human Rights,1994).
2. Agnes, Flavia. (1992). "Give us "Give us This Day Our Daily Bread: Procedures and Case Law on Maintenance". Majlis, Bombay.
3. Agnes, Flavia. (1999). "Law and Gender Inequality: The Politics of Women"s Rights in India". OUP, New Delhi

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	H	M	M	H	M	M	M	-	-	-	-	-
CO2	H	M	M	H	M	M	H	H	-	-	-	-	-
CO3	H	M	M	H	M	H	M	M	-	-	-	-	-
CO4	M	H	M	H	M	M	M	H	-	-	-	-	-
CO5	H	M	M	H	M	H	M	M	-	-	-	-	-

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Dr. P Nathiya	Dr. P Nathiya

23U1TAM404	Part - I : Muthamizh (முத்தமிழ்)		
Semester: IV	**Credits: 3**	**CIA: 20 Marks**	**ESE: 55 Marks**
Course Objective	சங்ககால மக்களின் வாழ்வியல் வாயிலாக பண்பாட்டுக் கூறுகளை உணர்த்துதல		
Course Category	Skill Development (மாணவர்களின் மொழித்திறனை ஊக்குவித்தல்)		
Development Needs	Global/Regional (உலக அளவில் தமிழ் மொழியின் அவசியத்தை உணர்த்துதல்)		
Course Description	மாணவர்களின் மொழித்திறனை ஊக்குவித்தல் மற்றும் உலக அளவில் தமிழ் மொழியின் அவசியத்தை உணர்த்துதல்		

Course Outcomes		**Teaching Methods**	**Assessment Methods**
CO 1	தமிழர்களின் வாழ்வியல் பண்புகளைக் கற்று அறிதல்.	விரிவுரை/காணொளிப் பட விளக்கம்	ஒப்படைவு
CO 2	தமிழ் இலக்கிய வகைகளைக் கூறுவதன் மூலம் தமிழின் இலக்கிய வளத்தை உணரச்செய்தல்.	விரிவுரை	குழுத்திட்டம்
CO 3	மாணவர்களிடையே காலத்திற்கேற்ப மனவளர்ச்சியை உருவாக்குதல்.	விரிவுரை/காணொளிப் பட விளக்கம்	கருத்தரங்கு
CO 4	நாட்டின் சிறந்த குடிமக்களாக மாணவர்களை உருவாக்குதல்.	விரிவுரை	ஒப்படைவு
CO 5	மாணவர்களின் மனநலத்தை வளர்த்தல்.	விரிவுரை/குழு விவாதம்	கருத்தரங்கு

Offered by தமிழ்த்துறை

Course Content: Muthamizh (முத்தமிழ்)			**Instructional Hours / Week : 4**
Unit	**Description**	**Text Book**	**Chapters**
I	எட்டுத்தொகை	1. நற்றிணை 2. குறுந்தொகை 3. பதிற்றுப்பத்து 4. புறநானூறு	1.1 குறிஞ்சி: நின்ற சொல்லார் .., 1.2 முல்லை : இளமை பாரார் ..., குறிஞ்சி : நிலத்தினும்..., பாலை :ஆடு அமை ...விளையாட்டு ஆயமொடு 1.3 ஐந்தாம் பத்து : ஊன் தூவை அடிசில் 1.4. யாதும் ஊரே .. பல் சான்றீரே .., அற்றைத்திங்கள்
			Instructional Hours **12 Hours**
Suggested Learning Methods: சங்க இலக்கிய வழி நற்பண்புகளை அறியச்செய்தல்			
II	பத்துப்பாட்டு	1.சிறுபாணாற்றுப்படை 2.குறிஞ்சிப்பாட்டு 3.பொருநர்ஆற்றுப்படை 4.மதுரைக்காஞ்சி	2.1 கடையெழு வள்ளல்கள் சிறப்பு 2.2 அறத்தொடு நிற்றல் 2.3 மன்னனின் விருந்தோம்பல் 2.4 பாண்டிய நெடுஞ்செழியன் குடிச்சிறப்பு
			Instructional Hours **12 Hours**
Suggested Learning Methods : புலவர்களின் மாண்புகளை வெளிப்படுத்துதல்			
III	அற இலக்கியங்கள்	1. நான்மணிக்கடிகை 2. இனியவை நாற்பது 3. களவழி நாற்பது- 4. ஆசாரக்கோவை	விளம்பிநாகனார் - (1-5 பாடல்கள்) பூதஞ்சேந்தனார் - (1-5 பாடல்கள்) பொய்கையார் - (11-15பாடல்கள்) பெருவாயின் முள்ளியார் (1-5 பாடல்கள்)
			Instructional Hours **12 Hours**
Suggested Learning Methods : அற இலக்கியங்களின் மாண்புகளை அறிய பெற்றமை			
IV	தமிழ்ச் செயலிகள்	தனித்தமிழ்	4.1 செயலிகள் அறிமுகம் 4.2 வகைகள்

			4.3 மொழிபெயர்ப்புச் செயலிகள் 4.4 தமிழ்ச் செயலிகள்
Instructional Hours			**12 Hours**
Suggested Learning Methods : தமிழ்ச் செயலிகள் பற்றி அறியும் வாய்ப்பு பெற்றமை			
V	இலக்கணம்	1.நன்னூல் 2.தொல்காப்பியம்	5.1 முதற்பொருள், கருப்பொருள், உரிப்பொருள் 5.2 பத்து அழகு 5.3 பத்து குற்றம் 5.4 ஆங்கிலத்திலிருந்து தமிழில் மொழிபெயர்த்தல்
Instructional Hours			**12 Hours**
Suggested Learning Methods : இலக்கண மாண்புகளை அறியும் திறன் பெற்றமை			
Total Hours			**60 Hours**

Text Books	1. இளங்கலை முதலாம் ஆண்டு தமிழ் மாணவர்களுக்குரிய பாடநூல் தொகுப்பு: "முத்தமிழ்" தமிழ்த்துறை, நேரு கலை மற்றும் அறிவியல் கல்லூரி, கோயம்புத்தூர்.
Reference Books	1. சங்க இலக்கியங்கள் - எட்டுத்தொகை, பத்துப்பாட்டு கழக வெளியீடு, திருநெல்வேலி. 2. தனித்தமிழ்- இளசுந்தரம், விகடன் பிரசுரம். சென்னை.
Web. URLs	https://youtu.be/GrNnb68Fd6w , https://youtu.be/14-sEAUzXP8 .

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Seminar	Assignment	Group Project	Total
4	4	5	2	2	3	20

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	**L**	H	L	H	H	M	H	**L**	**L**	**L**	**L**	**L**
CO2	M	**L**	H	L	M	L	M	H	**L**	**L**	**L**	**L**	**L**
CO3	H	**L**	H	L	H	H	M	H	**L**	**L**	**L**	**L**	**L**
CO4	M	**L**	M	L	H	H	H	M	**L**	**L**	**L**	**L**	**L**
CO5	H	**L**	L	L	M	H	L	M	**L**	**L**	**L**	**L**	**L**

H-High; M-Medium; L-Low

Course designed by	Verified by chairman
Dr. S. Satheesh kuma	Dr. A. Sridevi

Course Code	Title		
23U1HIN404	Part I - Prayogik Hindi (प्रायोगिक हिंदी)		
Semester: IV	Credits: 3	CIA: 20 Marks	ESE: 55 Marks
(Common to all UG Programmes)			
Course Objective	साक्षरता प्रशंसा और विश्लेषण के सौंदर्य, सांस्कृतिक और सामाजिक पहलुओं के प्रति छात्रों को संवेदनशील बनाना | उन्हें विभिन्न कालों के प्रख्यात लेखकों के हिंदी कथा साहित्य के बेहतरीन नमूने उपलब्ध कराना |		
Course Category	Skill Development		
Development Needs	National		
Course Description	Improves Creative Writing.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	छात्र हिंदी भाषा से अच्छी तरह वाकिफ हो सकेंगे।	Role play	Assignment
CO 2	पाठ्यक्रम संवादी हिंदी में पारंगत होने में मदद करता है।	Group learning Acting	Seminar
CO 3	छात्र आधुनिक हिंदी साहित्य का ज्ञान प्राप्त कर सकेंगे।	Story Narration	Assignment
CO 4	छात्रों को निबंध लेखन में अच्छा अभ्यास मिलेगा।	Group learning and Work sheets	Group Project
CO 5	छात्रों को फिल्म की समीक्षा करने का अभ्यास मिलेगा।	Worksheets and Exercises	Seminar

Offered by	Hindi

Course Content	Instructional Hours / Week : 4

Unit	Description	Text Book	Chapters
I	विरुद्ध उपन्यास: (मृणाल पाण्डे)	1	4
		Instructional Hours	12
Suggested Learning Methods : Visual Learning			02 Hrs
II	कथा माला , (मृदुला गर्ग) लौटना और लौटना : ममता जयशंकर) ,प्रसाद आदमी का बच्चा (यशपाल)	1	3
		Instructional Hours	12
Suggested Learning Methods : Auditory			02 Hrs
III	1.दिए गए अनुच्छेद पर समीक्षा लिखना 2.आधुनिक काल: प्रवृतियां और कवि	1	3
		Instructional Hours	12
Suggested Learning Methods : Comprehensive Writing			02 Hrs

IV	1.सामान्य निबंध: आधुनिक शिक्षा प्रणाली, मोबाइल का दुष्परिणाम, आधुनिक युवा पीढ़ी 2. हिंदी में दी गई कहानी के लिए सारांश लिखना।	1	2
		Instructional Hours	**12**
Suggested Learning Methods : Auditory, Visual, Comprehensive			**02 Hrs**
V	सिनेमा समीक्षा : पद्मावत	1	4
		Instructional Hours	**12**
Suggested Learning Methods : Comprehensive writing			**02 Hrs**
		Total Hours	**60 Hrs**

Text Books	1. विरुद्ध उपन्यास: (मृणाल पाण्डे) 2. कहानी कुंज , गोविंद प्रकाशन , मथुरा 3. हर हाल बेगाने - मृदुला गर्ग , राजपाल एंड संस , दिल्ली 4. मेरा परिवार , लोकभारत प्रकाशन , इलाहाबाद
Reference Books	1. संजय चौहान , समकालीन हिंदी साहित्य विचार और विवाद , आशा किताबें 2. श्री रामदेव, व्याकरण प्रदीप, लोकभारती प्रकाशन, अलाहाबाद 3. डॉ वासुदेव नंदन प्रसाद, आधुनिक हिंदी व्याकरण और रचना, भारती भवन प्रकाशक 4. ओंकार नाथ वर्मा , सामान्य हिंदी , अरिहंत प्रकाशन भारत लिमिटेड
Web. URLs	1. www.webdunia.com 2. www.hindikunj.com 3. hindi-natak-vikas.html 4. www.bhashaindia. 5. www.hindisamay.com 6. https://ebook.pustak.org/

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Group Project	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO 5
CO1	L	M	H	M	M	L	H	L	L	L	L	L	L
CO2	L	M	H	H	L	H	L	M	L	L	L	L	L
CO3	M	L	L	L	L	H	M	M	L	L	L	L	L
CO4	M	M	M	M	H	L	M	H	L	L	L	L	L
CO5	H	H	L	L	H	L	H	H	L	L	L	L	L

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Dr.S.Swarnalatha	Dr.S.Swarnalatha

Course Code	Title		
23U1MAL404	**Part - I : Drisyakalaa Saahithyam** (ദൃശ്യകലാസാഹിത്യം)		
Semester: IV	**Credits: 3**	**CIA: 20 Marks**	**ESE: 55 Marks**

(Common to all UG Programmes)

Course Objective	സിനിമ എന്ന മാധ്യമത്തിന്റെ വിവിധ തലങ്ങളെ ആഴത്തിൽ മനസ്സിലാക്കാൻ കഴിയുന്നു.ദൃശ്യാവിഷ്ക്കരണത്തെ കുറിച്ചുള്ള അറിവ് ലഭിക്കുന്നു.
Course Category	Skill Development
Development Needs	Regional
Course Description	Guide and encourage them to achieve their ambitions

	Course Outcomes	Teaching Methods	Assessment Methods
CO 1	തിരക്കഥയിലെ സംഭാഷണത്തിന്റെ പ്രസക്തി	Smart boards/ chalk and Talk	Assignment
CO 2	മനക്കരുത്തിലൂടെ വീട്ടിലെ എല്ലാ അംഗങ്ങളെയും ദുഃഖം അറിയിക്കാതെ മംഗളകർമ്മം നടത്തുന്നു.	Group learning	Seminar
CO 3	കുടുംബത്തിന്റെ തകരുന്ന മൂല്യത്തെ ഉയർത്തുന്നു	Peer Teaching	Assignment
CO 4	ദൃ ശ്യാവിഷ്ക്കരണം മലയാളത്തിൽ	Group learning	Group Project
CO 5	രംഗവേദിയുടെ അവതരണം	Smart boards/ chalk and Talk	Assignment

Offered by **Malayalam**

Course Content **Instructional Hours / Week : 4**

Unit	Description	Text Book	Chapters
I	തിരക്കഥ - ഞാൻ പ്രകാശൻ	1	5
		Instructional Hours	**12**
Suggested Learning Methods : Visual Learning			**02 Hrs**
II	തിരക്കഥ - ഞാൻ പ്രകാശൻ	1	5
		Instructional Hours	**12**
Suggested Learning Methods : Auditory, Visual			**02 Hrs**
III	തിരക്കഥ - ഞാൻ പ്രകാശൻ	1	3
		Instructional Hours	**12**
Suggested Learning Methods : Visual Learning			**02 Hrs**
IV	നാടകം - ഭരതവാക്യം	1	2
		Instructional Hours	**12**
Suggested Learning Methods: Auditory, Visual			**02 Hrs**
V	നാടകം - ഭരതവാക്യം	1	3
		Instructional Hours	**12**
Suggested Learning Methods : Visual Learning			**02 Hrs**
		Total Hours	**60 Hrs**

Text Books	1. തിരക്കഥ - ഞാൻ പ്രകാശൻ - ശ്രീനിവാസൻ, ഡി.സി.ബുക്സ് 2. നാടകം - ഭരതവാക്യം , ജി. ശങ്കരപ്പിള്ള
Reference Books	1. കഥയും തിരക്കഥയും ഡോ.ആർ.വി.എം.ദിവാകരൻ - എൻ. ബി. എസ് കോട്ടയം 2. മലയാള സിനിമയും സാഹിത്യവും - മധു ഇറവങ്കര - ഡി.സി.ബുക്സ് 3. ഒരു സിനിമ എങ്ങനെ ഉണ്ടാകുന്നു. - കെ.കെ. ചന്ദ്രൻ

	4. നാടക സാഹിത്യ ചരിത്രം - ജി. ശങ്കരപ്പിള്ള - ഡി.സി.ബുക്സ് 5. നാടകം കലയും കാഴ്ചയും - പി.ജി.സദാനന്ദൻ - ഡി.സി.ബുക്സ്
Web. URLs	**http://www.keralaculture.org>literature** **http://www.manoramaonline.com**

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Group Project	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO 5
CO1	H	L	H	H	H	H	H	H	L	L	L	L	L
CO2	M	L	H	M	H	M	M	M	L	L	L	L	L
CO3	H	L	M	M	M	H	M	H	L	L	L	L	L
CO4	H	L	L	H	L	H	M	M	L	L	L	L	L
CO5	M	L	L	H	L	H	M	M	L	L	L	L	L

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Ms.RAJANI N.	Dr.SMITHA C. R.

Course Code	Title		
23U2ENG404	Part – II : Communicative English – II		
Semester : IV	Credits : 3	CIA : 20 Marks	ESE : 55 Marks
(Common to All UG Programmes)			
Course Objective	To equip the students with Language Skills and develop interest in and appreciation of literature.		
Course Category	Skill Development		
Development Needs	Global		
Course Description	SD: Helps to develop LSRW skill		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the values of life reflected in the prescribed prose	Lecture/Tutorial	Assignment
CO 2	Learn to interpret poem based on contextual evidence.	Lecture/Tutorial	Assignment
CO 3	Enhance imaginative and communication skills through short stories.	Lecture/Tutorial	Speaking
CO 4	Understand the performing art through drama.	Lecture/Tutorial	Reading
CO 5	Acquire proficiency in English for global competency.	Lecture/Tutorial	Writing

Offered by	Department of English

Course Content	Instructional Hours / Week : 4

Unit	Description	Text Book	Chapters
I	**Prose** Francis Bacon – Of Adversity Dr. Radhakrishnan - Character is Destiny Sudha Murty - How I taught my grandmother to read	1	1
		Instructional Hours	**12**
Suggested Learning Methods : Intensive Reading			
II	**Poetry** Sarojini Naidu - The Soul's Prayer Emily Dickinson - Death in the Opposite House William Blake – London	1	2
		Instructional Hours	**12**
Suggested Learning Methods : Scaffolding Method			
III	**Short Stories** W. Somerset Maugham - Mr. Know-All Edgar Allan Poe-The Purloined Letter Ruskin Bond-The Thief Story	1	3
		Instructional Hours	**12**
Suggested Learning Methods : Flipped Learning			

IV	**Drama** William Shakespeare – As You Like It	1	4
		Instructional Hours	**12**
Suggested Learning Methods : Flipped Learning			
V	**GRAMMAR AND COMPOSITION** **Oral & Written Communication (Unit I–IV) Listening** – Comprehension practice from Poetry, Prose, Online Voice Practice, observing/viewing E-content (with subtitles), Guest/Invited Lectures, Conference/Seminar Presentations & Tests, and DD National News Live, BBC, CNN, VOA etc **Speaking** – In Group Discussion Forum, participate in the Turn Taking, and Conversation Management, Debating, Defending/Mock Viva- Voce, Seminar Presentations on Classroom-Assignments, and Peer-Team-interactions. **Reading**–Different Reading Strategies in Poetry, Prose, Novel, Newspaper etc **Writing** – Clauses – Conditional, Relative, Restrictive, Non-Restrictive, Denotation and Connotations Précis Writing, One word substitution.	1	5
		Instructional Hours	**12**
Suggested Learning Methods : Activity Based Learning			
		Total Hours	**60**

Text Books	Unit I – V: Compiled by the Department of English
Reference Books	CLIL (Content & Language Integrated Learning) – Module by TANSCHE NOTE: (Text: Prescribed chapters or pages will be given to the students by the department)
Web. URLs	

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Presentation	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	-	H	-	M	M	H	M	H	H	M	H	M
CO2	M	-	H	-	H	M	H	M	H	H	M	H	M
CO3	M	-	H	-	H	H	H	H	H	H	M	H	M
CO4	M	L	H	-	H	-	H	H	H	H	M	H	H
CO5	H	M	H	-	H	H	H	H	H	H	H	H	M

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Dr. Adappatu Ancy Antony	Dr. R Malathi

Course Code	Title		
23U3DTP406	Core Paper X: Practical in R Programming		
Semester: IV	Credits: 3	CIA: 30 Marks	ESE:45 Marks

Course Objective	To enable the students to write queries and create reports from the database using R Programme.
Course Category	Employability
Development Needs	Global
Course Description	The course covers practical issues in statistical computing which includes programming in R, reading data into R, accessing R packages, writing R functions, debugging, profiling R code, and organizing and commenting R code.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the basic R programming constructs	Program Demonstration	Program Creativity
CO 2	Have knowledge about data analysis and statistics solutions.	Program Demonstration	Debugging
CO 3	Impart the skills in programming using R in statistics and data analysis	Program Demonstration	Application of Logic
CO 4	Extract data from files and other sources and perform various data manipulation tasks on them.	Program Demonstration	Program Development
CO 5	To code Statistical functions in R and apply it in real time applications.	Program Demonstration	Program Development

Offered by	**Computer Science(Data Science)**
Course Content	**Instructional Hours / Week : 4**

Program List

1. Creating Vectors, Matrices, Factors and plotting graphs
2. Write an R-Program to demonstrate working with operators (Arithmetic, Relational, Logical, Assignment operators).
3. Create an R-Program
   To Check if a Number is Odd or Even
   To check if the given Number is a Prime Number
4. Develop an R-Program
   To find the Factors of a Number
   To find L.C.M and HCF of two numbers
5. Create an R program for performing string operations.
6. Using an R Program, make a Simple Calculator.
7. With the help of an R-Program using recursive function
   Find the Factorial of a Number
   Find Fibonacci sequence

8. Convert decimal to binary and vice versa Using R Program
9. Develop an R Program to create a Vector and to find sum, mean for the elements in a Vector.
10. Demonstrate matrix operations Using R (Addition, Subtraction, Multiplication, Division and Transpose).
11. Write an R Program a. To create a Data Frame.
12. Write an R Program for analyzing dataset using various charts.

Total Hours	60 Hrs

Tools for Assessment (30 Marks)

Laboratory Performance- Application of Logic	Laboratory Performance- Program Creativity	Laboratory Performance- Program Debugging	Test 1	Test 2	Observation Note Book	Total
4	4	4	7	7	4	30

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	H	H	L	M	H	L	M	H	H	H	H	M	M
CO2	H	H	L	M	H	L	M	H	H	H	H	M	M
CO3	H	H	L	M	H	L	M	H	H	H	H	H	H
CO4	H	H	L	M	H	L	M	H	H	H	H	H	H
CO5	H	H	L	M	H	L	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
D. J. ANITHA MERLIN	Dr. N. KAVITHA

Course Code	Title		
23U3CKC408	Core Paper XI: R Programming		
Semester: IV	Credits: 3	CIA:20 Marks	ESE: 55 Marks
Common to B. Sc. CS / CS(DS) and AIML			
Course Objective	To enhance the student with the fundamental concepts of R Programming		
Course Category	Employability		
Development Needs	Global		
Course Description	This course provides the basic knowledge in Data Analysis, Data Manipulation, Graphics, Data Frames And Interfacing.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Recognize the basics of R Programming	Lecture	Assignment
CO 2	Understand the concept of Matrices and Lists	Tutorial	Seminar
CO 3	Use of data frames and functions	Video Lectures	Quiz
CO 4	Describe the file operations and graphs	Tutorial	Program Execution
CO 5	Distinguish between Linear and Non Linear Models	Flipped Classroom	Program Execution

Offered by	Computer Science(Data Science)
Course Content	Instructional Hours / Week : 4

Unit	Description	Text Book	Chapters
I	**Introducing to R :**Introducing to R – R Data Structures – Help Functions in R – Vectors – Scalars – Declarations – Recycling – Common Vector Operations – Using all and any – Vectorized operations – NA and NULL values – Filtering – Vectorized if-then else – Vector Element names.	I	1-2
		Instructional Hours	**12**
Suggested Learning Methods: Video Lecturer			
II	**Matrices :**Creating Matrices – Matrix Operations – Applying Functions to Matrix Rows and Columns – Adding and deleting rows and columns - Vector/Matrix Distinction – Avoiding Dimension Reduction – Higher Dimensional arrays – lists – Creating lists – General list operations – Accessing list components and values – applying functions to lists – recursive lists	I	3-4
		Instructional Hours	12
Suggested Learning Methods : Case Study			
III	**Data Frames:** Creating Data Frames – Matrix-like operations in frames – merging Data frames – Applying functions to Data Frames – Factors and Tables – Factors and levels – Common Functions used with factors – Working with tables – Other factors and table related functions – Control statements – Arithmetic and Boolean operators and values – Default Values for arguments – Returning Boolean Values – Functions are objects – Environment and scope issues –	I	5-8

	Writing Upstairs – Recursion – Replacement functions – Tools for Composing function code – Math and Simulation in R.		
		Instructional Hours	12
Suggested Learning Methods : Assignment			
IV	**Classes:** S3 Classes – S4 Classes – Managing your objects – Input/output – accessing keyboard and monitor – reading and writing files – accessing the internet – String Manipulation – Graphics – Creating Graphs – Customizing Graphs – Saving Graphs to files – Creating Three-Dimensional plots.	I	9-12
		Instructional Hours	12
Suggested Learning Methods : Video Lecturer			
V	**Interfacing :** R to other languages – Parallel R – Basic Statistics – LinearModel – Generalized Linear models – Non-linear Models – Time Series and Auto-Correlation – Clustering.	II	15-17 20-22
		Instructional Hours	12
Suggested Learning Methods : Group Discussion			**02 Hrs**
		Total Hours	60Hrs

Text Books	1. Norman Matloff, ―The Art of R Programming: A Tour of Statistical Software Design‖, No Starch Press, 2011. 2. Jared P. Lander, ―R for Everyone: Advanced Analytics and Graphics‖, Addison-Wesley Data & Analytics Series, 2013.
Reference Books	1. Mark Gardner, Beginning R – The Statistical Programming Language‖, Wiley, 2013. 2. Robert Knell, Introductory R: A Beginner‘s Guide to Data Visualization, Statistical Analysis and programming in R, Amazon Digital South Asia Services Inc, 2013. Richard Cotton(2013). Learning R, O‘Reilly Media.

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	L	M	H	L	M	H	H	H	H	M	M
CO2	H	H	L	M	H	L	M	H	H	H	H	M	M
CO3	H	H	L	M	H	L	M	H	H	H	H	H	H
CO4	H	H	L	M	H	L	M	H	H	H	H	H	H
CO5	H	H	L	M	H	L	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
D. J. ANITHA MERLIN	Dr. N. KAVITHA

Course Code	Title		
23U3MKA404	Allied Paper IV Linear Algebra and Basics of Calculus		
Semester: IV	Credits : 4	CIA: 25Marks	ESE: 75 Marks

Course Objective	It enables the students to learn about the Matrices and differential calculus concepts.
Course Category	Skill Development
Development Needs	Global
Course Description	It is to provide critical mathematical background for applications in machine learning and Data science.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Identifying the properties of Matrices.	Lectures.	Assignment
CO 2	Outlining the concepts of Cayley – Hamilton Theorem and Diagonalizable matrices.	Lectures	Unit Test
CO 3	Recognising the basics of Differentiation	Lectures	Seminar
CO 4	Checking for Maxima and Minima of single variable functions.	Lectures	Assignment
CO 5	Implementing Rolle's and Mean value theorem to expand functions.	Lectures	Quiz

Offered by Mathematics

Course Content | **Instructional Hours / Week :6**

Unit	Description	Text Book	Chapters
I	Matrices: Introduction - Type of Matrices - Matrix Operations- Properties – Determinants - Inverse of a Matrix– Rank of a Matrix -Orthogonal Matrices - Solving Simultaneous linear Equations - Cramer's rule problem.	1	1,2,3
		Instructional Hours	**18**
Suggested Learning Methods : Problem Solving Practice			
II	Characteristic root and Characteristic Vector of a Matrix – Eigen values-Eigen vector-Cayley–Hamilton theorem - Diagonalizable Matrix - Problems.	1	4
		Instructional Hours	**18**
Suggested Learning Methods : Seminar			
III	Limits and continuity – Differentiation - Single value variable.	2	1, 2
		Instructional Hours	**18**
Suggested Learning Methods : Problem Solving Practice			
IV	Successive differentiation- Leibnitz Formula (Statement only) - Maxima and Minima for functions of single variables-Problems.	2	3, 5
		Instructional Hours	**18**
Suggested Learning Methods : https://www.youtube.com/watch?v=Le5f3FKtWXA			

V	Rolle's Theorem- Mean value theorem- Generalized Mean value theorem-Taylor's Theorem- Maclaurin's series for functions of single variables- Problems.	2	6,7
		Instructional Hours	**18**
Suggested Learning Methods : Problem Solving Practice			
		Total Hours	90 Hrs

Text Books	1. P. Kandasamy and Thilagavathy, **Mathematics for B.Sc. Branch I – Vol. II** (For B. Sc-I semester), S.Chand and Company Ltd, New Delhi, 2004. 2. T. K. Manicavachagom Pillay, S. Narayanan, **Calculus Volume -I**, S.Viswanathan (Printers and publishers) Pvt. Ltd. Reprint (2005)
Reference Books	1. P. Kandasamy, K.Thilagavathy, K.Gunavathi, Engineering Mathematics, Volume I, S.Chand Company, 2006. 2. Shanthi Narayanan & J.N.Kapoor, **A Text book of Calculus-**, S. Chand & Co. 3. G. Balaji, Engineering Mathematics – I, G. Balaji Publishers Pvt. Ltd, 3rd Edition, 2015
Web. URLs	1. https://nptel.ac.in/courses/111106051 2. https://www.mygreatlearning.com/blog/linear-algebra-for-machine-learning/ 3. https://www.youtube.com/watch?v=tVQZvJwi-ec

Tools for Assessment (25 Marks)

CIA I	CIA II	Model	Seminar	Assignment	Periodical Quizzes	Total
5	5	6	3	3	3	25

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	L	M	H	L	M	H	H	H	H	M	M
CO2	H	H	L	M	H	L	M	H	H	H	H	M	M
CO3	H	H	L	M	H	L	M	H	H	H	H	H	H
CO4	H	H	L	M	H	L	M	H	H	H	H	H	H
CO5	H	H	L	M	H	L	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
P. SHEEBA MAYBELL	Dr. T. CHANDRAPUSHPAM

Course Code	Title		
23U4DTZ402	**Skill Based Paper II: Practical in Internet of Things**		
Semester: IV	**Credits: 3**	**CIA: 30 Marks**	**ESE:45Marks**

Course Objective	On the successful completion of the course the students will able to design IoT applications..
Course Category	Employability
Development Needs	Global
Course Description	This Course focuses on hands-on IoT concepts such as sensing, This Course focuses on hands-on IoT concepts such as sensing, actuation and communication.

Course Outcomes		**Teaching Methods**	**Assessment Methods**
CO 1	Familiar with Arduino board working	Program Demonstration	Program Creativity
CO 2	Implement the design of digital meter	Program Demonstration	Debugging
CO 3	Interfacing with various sensors	Program Demonstration	Application of Logic
CO 4	Design with Tinkercad	Program Demonstration	Program Development
CO 5	Implementing IoT applications	Program Demonstration	Program Development

Offered by	**Computer Science(Data Science)**

Course Content	**Instructional Hours / Week : 4**

Program List

1. Demonstrate the working of Arduino
2. Blinking LED
3. Design of digital dc voltmeter
4. Measure the air humidity using sensor
5. Measure the temperature using sensor
6. Simulate motor control on Tinkercad

7. Measure the distance of an object using sensor
8. Smart Home Automation system
9. Sense the available network
10. Sense a finger when it is placed on board

Total Hours	60 Hrs

Tools for Assessment (30 Marks)

Laboratory Performance- Application of Logic	Laboratory Performance- Program Creativity	Laboratory Performance- Program Debugging	Test 1	Test 2	Observation Note Book	Total
4	4	4	7	7	4	30

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	H	H	L	M	H	L	M	H	H	H	H	M	M
CO2	H	H	L	M	H	L	M	H	H	H	H	M	M
CO3	H	H	L	M	H	L	M	H	H	H	H	H	H
CO4	H	H	L	M	H	L	M	H	H	H	H	H	H
CO5	H	H	L	M	H	L	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Dr. N. KAVITHA	Dr. N. KAVITHA

Course Code	Title	
23U3DTV407	Internship	
Semester: IV	Credits: 2	ESE:50 Marks

Objective:

To give optimum exposure on the practical side of industrial society

Guidelines:

1. Duration of the internship training is **20 Days** during the summer vacation which falls at the **end of the 3rd Semester.**
2. The departments concerned will prepare on exhaustive panel of institutions, industries and practitioners.
3. The individual student has to identify the institution / industry / practitioners of their choice and inform the same to the HOD / staff-in-charge.
4. The students hereafter will be called as trainees should maintain a work diary in which the daily work done should be entered and the same should be attested by the section in-charge.
5. The departments should prepare an outline of the job to be done, sections in which they have to be attached both in the office as well as in the field.
6. The trainees should strictly adhere to the rules and regulations and office timings of the institutions to which they are attached.
7. The trainees have to obtain a certificate on successful completion of the internship from the chief executive of the organization.
8. Monitoring and inspection by staff on a regular basis.
9. Report writing manual and format should be prepared by the respective departments.
10. All model forms are to be attached wherever it is necessary.
11. Report Evaluation: Internal viva-voce examination will be conducted and the maximum mark awarded is 50.
12. In-Plant Training has to be carried out only in the approved industries by the department/College
13. Report should be submitted in the 4thsemester.

Course Code	Title	
22U4NM4BT2	Part IV : Basic Tamil – II (அடிப்படைத்தமிழ் - II)	
Semester: IV	Credits: 2	CIA: 50 Marks

(Common to all UG Programmes)

Course Objective	அற இலக்கியங்களை அறிமுகப்படுத்தல்.
Course Category	Skill Development (மாணவர்களின் மொழித்திறனை ஊக்குவித்தல்)
Development Needs	**Regional (** தமிழ் மொழியின் அவசியத்தை உணர்த்துதல்**)**
Course Description	மாணவர்களின் மொழித்திறனை ஊக்குவித்தல்

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	அற இலக்கிய அறிவு பெறுதல் - சிறுகதைகள் வழி சமூக அறிவு பெறுதல்.	விரிவுரை / காணொளி வகுப்பு	ஒப்படைவு
CO 2	தமிழ் எழுத்துக்கள் அறிமுகம் செய்தல் மற்றும் வாசித்தல் ஆகியவற்றின் பயன்பாடு.	குழு விவாதம்/ விரிவுரை	கருத்தரங்கு
CO 3	பிறமொழி அறிவுத் திறன் மேம்படச்செய்தல்.	விரிவுரை/காணொளி ப்பட விளக்கம்	ஒப்படைவு
CO 4	மொழிப்பெயர்ப்புத் திறன் மேம்படச்செய்தல்.	விரிவுரை/ குழு விவாதம்	குழுத்திட்டம்
CO 5	வார்த்தை அமைக்கும் திறன் பெறச்செய்தல்.	விரிவுரை / குழுத்திட்டம்	குழுத்திட்டம்

Offered by தமிழ்த்துறை

Course Content : Basic Tamil – II (அடிப்படைத்தமிழ் II) | **Instructional Hours / Week : 2 Hours**

Unit	Description	Text Book	Chapters
I	நீதி நூல்கள்	1.பாரதியார் ஆத்திச்சூடி 2.கொன்றைவேந்தன்	1.1 1 முதல் 12 வரிகள் 2.1 1 முதல் 7 வரிகள்
		Instructional Hours	**6 Hours**
Suggested Learning Methods : நீதிநூல்களின் சிறப்பினை அறியும் பயன் பெற்றமை			
II	பதினெண் கீழ்க்கணக்கு நூல் (திருக்குறள்)	திருக்குறள்	2.1.கடவுள் வாழ்த்து -அகர முதல எனத் தொடங்கும்... அதி 1 குறள் -1 2.2. வான் சிறப்பு- நீரின்றி அமையாது உலகு. அதி-2.குறள் - 10 2.3. அன்புடைமை - அன்பின் வழியது உயிர்நிலை. அதி - 8.குறள் - 10 2.4. கல்வி - கண்ணுடையார் என்பர் . அதி-40 குறள்-393 2.5. இனியவை கூறல் - இனிய உளவாக இன்னாத அதி10. குறள் -10
		Instructional Hours	**6 Hours**
Suggested Learning Methods : திருக்குறளின் சிறப்பினை அறிந்தமை			
III	கிராமியக் கதைகள்	கிராமியக் கதைகள்	3.1.பரமார்த்தக்குரு கதைகள் 3.2.நாட்டுப்புறக் கதைகள் அறிமுகம்
		Instructional Hours	**6 Hours**
Suggested Learning Methods : கிராமியக் கதைகளின் கதை அமைப்பினை அறியும் வாய்ப்பு பெற்றமை			

IV	மொழிப்பயிற்சி	மொழிப்பயிற்சி	4.1. பிறமொழிச் சொற்களுக்கு தமிழ்ச்சொல் எழுதுதல்
Instructional Hours			**6 Hours**
Suggested Learning Methods :		தமிழ்ச்சொல் எழுதும் திறன் பெற்றமை	
V	எழுத்துப்பயிற்சி	எழுத்துப்பயிற்சி	5.1தன்விவரம் எழுதுதல் 5.2 பெயர், கல்லூரி விவரம் எழுதச்செய்தல்
Instructional Hours			**6 Hours**
Suggested Learning Methods : பிறமொழி கலப்பு இன்றி தமிழ்ச்சொல் எழுதும் திறன் பெற்றமை			
Total Hours			**30 Hours**
Text Books	1. இளங்கலை தமிழ் மாணவர்களுக்குரிய பாடநூல்"அரிச்சுவடி" 2. தொகுப்பு: தமிழ்த்துறை, நேரு கலை மற்றும் அறிவியல் கல்லூரி, கோயம்புத்தூர்.		
Reference Books	1. ஔவையார் ஆத்திச்சூடி மணிவாசகர் பதிப்பகம், கோயம்புத்தூர் இராஜவீதி,01. 2. திருக்குறள் - பரிமேலழகர் உரை, மணிவாசகர் பதிப்பகம், சென்னை - 600018.		
Web. URLs	https://youtu.be/d5be921uxhE, https://youtu.be/Wtg-GJPfXTM.		

Tools for Assessment (50 Marks)

CIA I	CIA II	CIA III	Seminar	Assignment	Group Project	Total
8	8	10	8	8	8	50

Mapping

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	L	H	L	H	M	H	H	L	L	L	L	L
CO2	L	L	H	L	M	M	L	H	L	L	L	L	L
CO3	H	L	H	L	L	M	M	H	L	L	L	L	L
CO4	H	L	M	L	L	M	H	M	L	L	L	L	L
CO5	H	L	H	L	M	M	H	H	L	L	L	L	L

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Dr. S. Satheesh Kumar	Dr. A. Sridevi

Course Code	Title	
22U4NM4AT2	Part IV : Advanced Tamil – II (சிறப்புத்தமிழ் -II)	
Semester: IV	Credits: 2	ESE: 50 Marks

Course Objective	நூல்களின் வழி அறச் சிந்தனைகளை உருவாக்குதல் செம்மொழியினைச் செம்மைப்படுத்துதல்.
Course Category	Skill Development (மாணவர்களின் மொழித்திறனை ஊக்குவித்தல்)
Development Needs	Regional (தமிழ் மொழியின் அவசியத்தை உணர்த்துதல்)
Course Description	மாணவர்களின் மொழித்திறனை ஊக்குவித்தல்

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	அறச்சிந்தனைகள் பெறுதல் மற்றும் இலக்கண வழக்கு முறைகளைப் பெறுதல்.	விரிவுரை/காணொளிப்பட விளக்கம்	கருத்தரங்கு
CO 2	கடிதம் எழுதுதல் மற்றும் மொழியறிவைப் பெறுதல்	விரிவுரை/ குழு விவாதம்	ஒப்படைவு
CO 3	படைப்பாக்கத்திறன் அறிவுபெறச்செய்தல்	விரிவுரை	கருத்தரங்கு
CO 4	தகவல் தொடர்பியலுக்கானகடிதம்,அமைவுத்திறன் பெறச்செய்தல்	விரிவுரை/ குழு விவாதம்	குழுத்திட்டம்
CO 5	மொழியைப் பிழையின்றிப் பேச,எழுதும் திறன் பெறச்செய்தல்	விரிவுரை/காணொளிப்பட விளக்கம்	ஒப்படைவு

Offered by தமிழ்த்துறை

Course Content : Advanced Tamil – II (சிறப்புத்தமிழ் -II) | **Instructional Hours / Week : 2**

Unit	Description	Text Book	Chapters
I	பதினெண் கீழ்க்கணக்கு நூல்கள்	1.திருக்குறள் 2.நாலடியார்	1.1. கூடாநட்பு 1.2. செய்நன்றியறிதல் - நாலடியார் 1.3. கல்வி (131,132 செய்யுள்கள்)
		Instructional Hours	**6**
Suggested Learning Methods : திருக்குறளின் சுவை அறியும் வாய்ப்பு பெற்றமை			
II	சிறுகதை	1.வெ.இறையன்பு - பூனாத்தி சிறுகதைகள்	2.1 சேவியர் வாத்தியார் 2.2 தூரிகை
		Instructional Hours	**6**
Suggested Learning Methods : சிறுகதைகளின் சுவை அறியும் வாய்ப்பு பெற்றமை			
III	இலக்கணம்	இலக்கணப் பயிற்சி ஏடு	3.1 எழுத்தும் சொல்லும் 3.2 சுட்டெழுத்துகள் 3.3 சொற்களைச் சரியாகப் பயன்படுத்தும் முறை 3.4 வினைச்சொற்கள், பெயர்ச்சொற்கள் 3.5 வினா எழுத்துகள்
		Instructional Hours	**6**
Suggested Learning Methods : இலக்கணப் பிழை இன்றி எழுதும் பயிற்சி பெற்றமை			
IV	வழக்கறிதல்	இலக்கணம்	மரபு வழக்கு - இயல்பு வழக்கு, தகுதி வழக்கு - அறிதல்
		Instructional Hours	**6**
Suggested Learning Methods : வழக்குகள் பற்றி முழுமையாக அறியும் பயிற்சி பெற்றமை			

V	படைப்பாற்றல் பயிற்சி	இலக்கிய வரலாறு	கவிதை–சிறுகதை–நூல் மதிப்பீடு எழுதுதல்
Instructional Hours			**6**
Suggested Learning Methods : மதிப்பீடு செய்யும் பயிற்சி பெற்றமை			
		Total Hours	**30 Hrs**

Text Books	1. இளங்கலைத்தமிழ் மாணவர்களுக்குரிய பாடநூல்"திரட்டு" தொகுப்பு: தமிழ்த்துறை, நேரு கலை மற்றும் அறிவியல் கல்லூரி, கோயம்புத்தூர்.
Reference Books	1. திருக்குறள் –பரிமேலழகர் உரை, மணிவாசகர் பதிப்பகம், சென்னை - 018 2. வெ.இறையன்பு - பூனாத்தி சிறுகதைகள், விஜயா பதிப்பகம், கோவை.
Web. URLs	https://youtu.be/_vB59q6At8s, https://youtu.be/aSvxO_rV9eQ.

Course designed by	**Verified by Chairman**
Dr. S. Satheesh Kumar	**Dr. A. Sridevi**

Course Code	Title	
22U4NM4GEN	Non Major Elective : General Awareness	
Semester : IV	Credits : 2	ESE : 50 Marks

(Common to all UG Programmes)

Course Objective:

Enable the students to learn General knowledge and prepare for different competitive exams.

Course Outcomes:

CO1	Determine Verbal Aptitude , Numerical Aptitude and Logical Reasoning
CO2	Recall basic Science, history , Tamil , Computer , Commerce concepts which would help to crack competitive Examinations
CO3	Acquire time Management skills to attempt competitive Examinations
CO4	Develop Aptitude and problem solving skills
CO5	Gain Knowledge about Current Affairs

Course Content **Instructional Hours / Week : 2**

S. No.	Topics
1.	Verbal Aptitude
2.	Numerical Aptitudeand Logical Reasoning
3.	Abstract Reasoning
4.	Tamil and Other Literature
5.	General Science and Technology
6.	Computer
7.	Economics and Commerce
8.	History and Freedom Struggle
9.	Sports
10.	Current Affairs
	Total Hours : 30

Text Book: "General Awareness", compiled by Nehru Arts and Science College, Coimbatore

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	L	-	-	H	-	-	L	L	-	-	L	L
CO2	H	L	-	-	H	-	-	L	L	-	-	L	L
CO3	H	L	-	-	H	-	-	L	L	-	-	L	L
CO4	H	L	-	-	H	-	-	L	L	-	-	L	L
CO5	H	L	-	-	H	-	-	L	L	-	-	L	L

H-High; M-Medium; L-Low

Course Designed by	Verified by Chairman
P Sheeba Maybell	Dr. T Chandrapushpam

Course Code	Title	
22U4VBOE01	Value Based Open Elective Course : Design Ecosystem	
Semester: IV	Credits: 2	ESE: 50 Marks

Course Objective	To gain the knowledge on ecosystem and environmental sustainability
Course Category	Crosscutting Issue : Environment And Sustainability
Development Needs	Global
Course Description	Design ecosystem describes about the components, types, structural and functional unit of ecology where the living organisms interact with each other and the surrounding environment.

Course Outcomes		**Teaching Methods**
CO 1	Understand about the basic concepts of ecosystem and environmental planning	Lecture / Video Lessons
CO 2	Gain knowledge of challenges and design process of ecosystem	Lectures / Video Lessons
CO 3	Understand about functions and flow of energy in ecosystem	Case study / Model
CO 4	Analyse about process and mechanism of ecosystem control	Tutorial / Group Discussion
CO 5	Demonstrate about green infrastructure and regulatory framework	Lecture / Tutorial

Course Content — **Instructional Hours / Week : 2**

Unit	Description	Text Book	Chapters
I	**Sustainable Human Dominated-Ecosystem and Environmental planning:** Introduction to Ecology & environmental sciences; Principles and Scope of Ecology. Axioms of Ecological Engineering, Sustainable design principles, Global population dymanics, Human dominated earth.	1	1
		Instructional Hours	**6**
Suggested Learning Methods : Video Lectures			
II	**Designing Ecosystem services & Biomes:** Design challenges and needs, the design process, biomes, ecoregions, other land classification systems.	1	3 & 4
		Instructional Hours	**6**
Suggested Learning Methods : Video Tutorials			
III	**Energy and mass flow through ecosystem:** Structure and Functions of Ecosystems - Abiotic and Biotic components, Flow of energy and cycling of materials; water, carbon, nitrogen and phosphorus	3	2
		Instructional Hours	**6**
Suggested Learning Methods : Group Discussion			

IV	**Ecosystem control:** Population control process, community control process. Stream restoration design - hydrology, sedimentology, geomorphology, habitat, riparian corridor and construction.	2	6
		Instructional Hours	**6**
Suggested Learning Methods : Group Discussion			
V	**Green infrastructure design:** Green infrastructure network, sustainable cities initiatives, agricultural sustainability indicators, surrounding environmental, ecological and social justice; environmental ethics, issues and possible solutions	3	4
		Instructional Hours	**6**
Suggested Learning Methods : Online Tutorial			
		Total Hours	**30**

Text Books	1. Matlock, M. D. and M. Robert. Ecological Engineering Design: Restoring and Conserving Ecosystem Services. JohnWiley & Sons, Inc. 2011. 2. Meffe, G.K., L. Nielson, R. L. Knight and D. Schenborn. Ecosystem Management: Adaptive, Community-Based Conservation. Island Press. 2012. 3. Elliot, D. 2003. Energy, Society and Environment, Technology for a Sustainable Future. Routledge Press.
Reference Books	1. Sim Van Der Ryn and S. Cowan. Ecological Design. Island Press, 1996. 2. Neeraja, N. Environment and Ecology: A Dymanic Approach, 3rd Edition. GKP Books Catalogue. 2018.
Web. URLs	1. https://www.nationalgeographic.org/encyclopedia/ecosystem/ 2. https://www.environmentandecology.com/

Course designed by	**Verified by Chairman**
Dr. S Esath Natheer	Dr. M Thangavel

Course Code	Title	
22U4VBOE02	Value Based Open Elective Course: Design Thinking	
Semester: IV	Credits : 2	ESE : 50 Marks

Course Objective	Inculcate the fundamental concepts of design thinking and develop the students as a good designer by imparting creativity and problem solving ability
Course Category	Crosscutting Issue : Professional Ethics
Development Needs	Local, National and Global
Course Description	The course aims to provideintroduction to the basic concepts and techniques of design thinking and methods of implementing design thinking in the real world.

Course Outcomes		Teaching Methods
CO 1	Learn the basic concepts of design thinking	Direct Instruction
CO 2	Develop the skill of applying the design thinking	Direct Instruction
CO 3	Learn the business uses of design thinking	Video Lessons
CO 4	Understand the variety of approaches within the design thinking discipline	Direct Instruction
CO 5	Impart knowledge in design thinking mindset	Direct Instruction

Course Content	Instructional Hours / Week: 2

Unit	Description	Text Book	Chapters
I	**Design Thinking Background** Definition of Design Thinking, Variety within the Design Thinking Discipline, Design Thinking Mindset	1	1
		Instructional Hours	**06**
Suggested Learning Methods: Brain Storming			
II	**Design Thinking Approach** Fundamental Concepts – Empathy, Ethnography, Divergent Thinking, Convergent Thinking, Visual Thinking, Assumption Testing, Prototyping, Time for Learning and Validation	1	5,1,3
		Instructional Hours	**06**
Suggested Learning Methods : Learning by Teaching			
III	**Design Thinking Resources** – People, place, material, organizational fit **Design Thinking Processes** - Numerous Approaches, Double Diamond Process, 5-Stage, School Process, Designing for Growth Process, Role of Project Management	1	5,6
		Instructional Hours	**06**
Suggested Learning Methods : DIY Activities			

IV	**Design Thinking in Practice I:** Process Stages of Designing for Growth - Design Thinking Tools and Methods – I- Purposeful Use of Tools and Alignment with Process, Visualization, Journey Mapping	1	6
		Instructional Hours	**06**
Suggested Learning Methods: Case Method			
V	**Design Thinking in Practice II:** Design Thinking Tools and Methods – II- Value Chain Analysis, Mind Mapping, Brainstorming, Concept Development, Assumption Testing, Rapid Prototyping, Customer Co-Creation, Learning Launch	2	8
		Instructional Hours	**06**
Suggested Learning Methods : Project Based Learning			
		Total Hours	**30**

Text Books	1. "Designing for growth: A design thinking tool kit for managers", by Jeanne Liedtka and Tim Ogilvie., 2011, ISBN 978-0-231-15838-1 2. "The design thinking playbook: Mindful digital transformation of teams, products, services, businesses and ecosystems", by Michael Lewrick, Patrick Link, Larry Leifer., 2018, ISBN 978-1-119-46747-2
Reference Books	1. "Presumptive design: Design provocations for innovation", by Leo Frishberg and Charles Lambdin., 2016, ISBN: 978-0-12-803086-8 2. "Systems thinking: Managing chaos and complexity: A platform for designing business architecture.", "Chapter Seven: Design Thinking", by JamshidGharajedaghi, 2011, ISBN 978-0-12-385915-0
Web. URLs	1. https://www.designcouncil.org.uk/news-opinion/design-process-what-double-diamond

Course designed by	**Verified by Chairman**
M Nandhini	Dr. S Jayapriya

Course Code	Title	
22U4VBOE03	Value Based Open Elective Course : Disaster Management	
Semester: IV	Credits: 2	ESE: 50 Marks

Course Objective	To learn knowledge about disaster and risk and apply the same in the time of any disaster.
Course Category	Crosscutting Issue : Environment And Sustainability
Development Needs	National
Course Description	This course is designed to provide students with a comprehensive understanding of the concepts, theories, and practices of disaster and risk management. Students will learn how to identify and assess risks, develop emergency plans, and mitigate the impact of disasters on communities and organizations.

Course Outcomes		Teaching Methods
CO 1	Understand different types of disasters and their impact on individuals and communities.	Lecture/ Demonstration
CO 2	Analyze the disaster management scenario in India, the policy framework, and the role of different stakeholders in reducing disaster risk and building resilience	Lecture/ Case Studies
CO 3	Understand the concepts of risk and vulnerability in disaster management and analyze the different approaches to disaster risk reduction.	Lectures / Video Lessons
CO 4	Analyze the concept and nature of disaster preparedness, different components of a disaster preparedness plan	Tutorial / Case Studies
CO 5	Narrate the emergency responses to be taken by the national disaster management force and the practical training process on disaster management	Lecture / Class Projects

Course Content	**Instructional Hours / Week:2**

Unit	Description	Text Book	Chapters
I	**Introduction on Disaster** Definitions and Terminologies used in Disaster Management, Basic concepts in Disaster Management, Types of Disaster: Natural Disaster: Flood, Cyclone, Earthquakes, Landslides, epidemic or Pandemic etc. (Case studies of each), Man-made Disaster: Fire, Industrial Pollution, Nuclear Disaster, Biological Disasters, Accidents (Air, Sea, Rail & Road), Structural failures (Building and Bridge), War & Terrorism etc. (Case studies of each).	1	1
	Instructional Hours		**6**
Suggested Learning Methods : Power Point Presentation			
II	**Disaster management in India** Hazard and Vulnerability Profile India, Disaster Management Indian scenario, India's vulnerability profile, Disaster Management Act 2005 and Policy guidelines, National Institute of Disaster Management, National Disaster Response Force (NDRF),	1	2

	National Disaster Management Authority, States Disaster Management Authority, District Disaster Management Authority and Cases Studies.		
		Instructional Hours	**6**
Suggested Learning Methods : PPT and Video Lecture			
III	**Risk and Vulnerability** Analysis Risk: Assessing Disaster Risk, Disaster Risk Reduction, Vulnerability: Its concept and analysis, Strategic Development for Vulnerability Reduction, Climate Variability & Disaster Risk, Industrial hazard and Risk Management	1	3
		Instructional Hours	**6**
Suggested Learning Methods : Video Lecture			
IV	**Disaster Preparedness** Concept and Nature, Disaster Preparedness Plan, Prediction, Early Warnings and Safety Measures of Disaster, Role of Information, Education, Communication, and Training, Role of Government, International and NGO Bodies.	1	4
		Instructional Hours	**6**
Suggested Learning Methods : PPT and Group Activity			
V	**Response and 3Rs** Emergency Response: Introduction, Crisis Response Plan (CRP), Communication, Participation, and Activation of Emergency Preparedness Plan, Search, Rescue, Evacuation and Logistic Management, Role of Government, International and NGO Bodies, Psychological relief and recovery, Relief operation and Recovery, Post Disaster Public Health Management, 3R - Rehabilitation, Reconstruction and Recovery, Reconstruction and Rehabilitation as a Means of Development, Damage Assessment, Post Disaster effects and Remedial Measures, Role of Educational Institutions in Disaster management.	1	5
		Instructional Hours	**6**
Suggested Learning Methods : Laboratory Practice			
		Total Hours	**30**

Text Books	1. Disaster and Risk Management (2023), Notes Compiled by the Department of Criminology, Nehru Arts and Science College, Coimbatore
Reference Books	1. J. P. Singhal, "Disaster Management", Laxmi Publications, 2003. 2. M C Gupta, "Manual on Natural Disaster Management in India", NIDM, New Delhi, 2013 3. R K Bhandani, "An Overview on Natural &Man-made Disasters and their Reduction", CSIR, New Delhi, 2000 4. Dr. Mrinalini Pandey, "Disaster Management", Wiley India Pvt. Ltd, 2014. 5. National Disaster Management Authority Publications-Guidelines & Templates for Disaster Management

Course designed by	**Verified by Chairman**
Dr. Reneesh K Rajan	Dr. Reneesh K Rajan

Course Code	Title	
22U4VBOE04	**Value Based Open Elective Course : Environmental Pollution and Waste Management**	
Semester: IV	**Credits: 2**	**ESE: 50 Marks**

Course Objective	To acquire deeper knowledge about Environmental Management Systems
Course Category	Crosscutting Issue : Environment And Sustainability
Development Needs	Global
Course Description	Environmental Pollution and waste Management involves studying the management of any unnecessary resource use or release of substances into the water, land or air that could harm human health or the environment

Course Outcomes		**Teaching Methods**
CO 1	Understand the types of environmental pollutants	Lecture / Group Learning
CO 2	Describe, develop and interpret methods of the Environmental Management Systems.	Lecture/ Online Tutorial
CO 3	Critically evaluate methods and possibilities within Environmental Management Systems from asystems perspective.	Lecture/ Online Tutorial
CO 4	Understand the effective management of environmental pollutants	Lecture/ Online Tutorial
CO 5	Learn Environmental Auditing for various Industries/Projects.	Lecture/ Online Tutorial

Course Content	**Instructional Hours / Week : 2**

Unit	Description	Text Book	Chapters
I	Introduction to Environmental pollutants,Types of pollutants, Biodegradable pollutants, Non-biodegradable pollutants; Air pollution, Water Pollution, Soil Pollution	1	1,2
		Instructional Hours	**6**
Suggested Learning Methods: Industrial Visit			
II	Introduction to Environmental Management System basic definitions and terms, Framework for Environmental Management Systems, Approach for developing an Environmental Management System.	2	2, 4
		Instructional Hours	**6**
Suggested Learning Methods :Web search			
III	The introduction and implementation of ISO 14001: environmental policy, planning, implementation and operation, checking, management review. Applications EMS in terms of Process flow chart, effluent Generation, composition and treatment of effluents from following industries – sugar, pulp and paper, electroplating, dairy, oil refineries, etc.	2	5
		Instructional Hours	**6**
Suggested Learning Methods : Online tutorial			
IV	Introduction to Environmental Auditing, Category “A” & “B” types of projects. Procedures and Guidelines to conduct Environmental Audit.	3	7

	Plastic Pollution: Causes, impacts, and reduction strategies -Global issue of plastic pollution and innovative solutions		
		Instructional Hours	**6**
Suggested Learning Methods : Online tutorial			
V	Municipal Solid Waste Management: Collection, transportation, and disposal of solid waste - Examination of waste treatment technologies and waste-to-energy processes. E-waste Management: Challenges and recycling techniques for electronic waste - Discussion on the environmental and health hazards associated with improper e-waste disposal.	1	8
		Instructional Hours	**6**
Suggested Learning Methods : Online tutorial			
		Total Hours	**30**

Text Books	1. ISO 14001 Certification - Environmental Management Systems: A Practical Guide for Preparing Effective Environmental Management Systems Textbook Binding – Import, 10 Aug 1995 by W. Lee Kuhre (Author) 2. M. N Rao, "Waste Water Treatment" Oxford and IBH publishing Co. Pvt Ltd, 2007 3. Peavy, H.S, D.R. Rowe &T.George, "Environmental Engineering", New York: McGraw Hill, 1987
Reference Books	1. Christopher Sheldon and Mark Yoxon, "Installing Environmental management Systems – a step by step guide" Earthscan Publications Ltd, London, 1999.
Web. URLs	1. https://www.anits.edu.in/online_tutorials/es/Unit%203.pdf

Course designed by	**Verified by Chairman**
Dr. O S Nimmi	Dr. N Saranya

Course Code	Title	
22U4VB0E05	Value Based Open Elective Course : History of Ancient India	
Semester: IV	Credits: 02	ESE : 50 Marks

Course Objective	To explore the rich and diverse history of ancient India, examining its civilizations, political systems and cultural achievements.
Course Category	Employability
Development Needs	Global
Course Description	This course gives an in depth analysis of the Ancient Indian History marking the beginning of urban civilization in the Indian subcontinent.

Course Outcomes		Teaching Methods
CO 1	Understand the salient features of Indus valley civilization	Lecture
CO 2	Evaluate the features Civilizations	Tutorial
CO 3	Evaluate the rise of new movements	Lecture
CO 4	Visualize the administration of Mauryas and the art and architecture of Mauryas	Tutorial
CO 5	Identify the administration of Guptas and their contribution to University	Lecture

Course Content — **Instructional Hours / Week : 2**

Unit	Description	Text Book	Chapters
I	Definitions - Nature and Scope of History - History and Its Relationship with other Social Sciences - Geographical Features of India Sources of Indian History: Pre- History Paleolithic, Mesolithic, Neolithic, Chalcolithic and Megalithic Cultures.	1 &4	1-5
		Instructional Hours	**6**
Suggested Learning Methods : Lecture/Tutorial			
II	Indus Valley Civilization - Its Features & Decline; Early Vedic and Later Vedic Civilizations Vedic Literature Society Economy - Polity Religion.	2	2-4
		Instructional Hours	**6**
Suggested Learning Methods : Lecture/Tutorial			
III	Rise of New Religious Movements Charvakas, Lokayathas, Jainism and Buddhism; Mahajanapadas - Rise of Magadha; Impact.	3	3
		Instructional Hours	**6**
Suggested Learning Methods : Lecture/Tutorial			

IV	Foundation of the Mauryan Dynasty; Ashoka and His Dharma Polity Administration - Society Economy Religion Literature - Art and Architecture; Disintegration of the Mauryan Empire; Post-Mauryan Kingdoms - Indo-Greeks - Kushanas and Kanishka - Society Economy Literature Art and Architecture; The Satavahanas; Sangam Age Literary Development.	4	4 &5
		Instructional Hours	**6**
Suggested Learning Methods : Lecture/Tutorial			
V	Gupta Empire: A Brief Political Survey - Polity and Administration, Social and Economic Conditions, Agriculture and Land Grants - Feudalism, Caste System, Position of Women, Education, Literature, Science and Technology, Art and Architecture - Harshavardana and His Achievements.	4	5
		Instructional Hours	**6**
Suggested Learning Methods : Lecture/Tutorial			
		Total Hours	**30**

Text Books	1. E.H. Carr, What is History? Penguin Books, England, 1990. 2. Majumdar, R.C., History and Culture of the Indian People, Vols. I, II & & III. 3. Romila Thapar, Asoka and the Decline of the Mauryas, OUP, New Delhi, 1995. 4. Romila Thapar, Early India (From the earliest to AD 1300).
Reference Books	1. Poonam Dalal : Ancient and Medival India for UPSC & State Level Exam

Course designed by	**Verified by Chairman**
S Kavitha	Dr. R Malathi

Course Code	Title	
22U4VBOE06	Value Based Open Elective Course : Indian Knowledge System	
Semester: IV	Credits: 2	ESE: 50 Marks

Course Objective	To make the students understand the knowledge system in India and apply it to their day to day life
Course Category	Value Education
Development Needs	National
Course Description	This course will actively engage for spreading the rich heritage of our country and traditional knowledge in the field of Arts and literature, Agriculture, Basic Sciences, Engineering & Technology, Architecture, Management, Economics, etc

Course Outcomes		Teaching Methods
CO 1	Understand the History and an overview of Indian knowledge System.	Flipped Classroom
CO 2	Interpret the Importance of Vedic Corpus and Philosophical System	Student Centric
CO 3	Analyse the Foundational Concepts like Linguistics and and Number Systems.	Blended Mode
CO 4	Interpret the concepts of Astronomy and Town Planning Architecture.	Flipped Classroom
CO 5	Describe the Importance of Health, Wellness, Psychology and Administrative Governance	Case-Base

Course Content — **Instructional Hours / Week : 2**

Unit	Description	Text Book	Chapters
I	**Indian Knowledge System** : An Introduction: Importance of Ancient Knowledge-Defining Indian Knowledge System –The Indian Knowledge System Corpus-A Classification Framework-History of Indian Knowledge System.	1	1
		Instructional Hours	**06**
Suggested Learning Methods : Cooperative Learning			
II	**The Vedic Corpus**: Introduction to Vedas-The four Vedas. **Philosophical System**: Indian Philosophical System – Development and Unique Features-Vedic schools of Philosophy.	1	2 & 3
		Instructional Hours	**06**
Suggested Learning Methods : Peer Learning			

III	**Linguistics:** Component of a Language-Role of Sanskrit in Natural Language Processing. **Mathematics:** Unique Aspects of Indian Mathematics-Great Mathematicians and their Contributions-Arithmetic Calculations.	1	5 & 8
		Instructional Hours	**06**
Suggested Learning Methods : Group Learning			
IV	**Astronomy:** Unique aspects of Indian Astronomy-Historical Development of Astronomy in India-Elements of the Indian Calendar **Town Planning Architecture:** Indian Architecture- A Historical Perspective –Town Planning-Unitary Building –Temple Architecture	1	9 & 12
		Instructional Hours	**06**
Suggested Learning Methods : Mind Mapping			
V	**Health, Wellness and Psychology:** Ayurveda -Definition of Health-Tridosas-Relationships to Health-Disease-Disease Management-Yoga way of Life-Indian Approach to Psychology. **Governance and Public Administration:** Arthasastra Governance and Administration.	1	13 & 14
		Instructional Hours	**06**
Suggested Learning Methods : Case Studies			
		Total Hours	**30**

Text Books	1. B.Mahadevan,Vinayak Rajat Bhat,Nagendra Pavana R.N , Introduction to Indian Knowledge System: Concepts and Applications, PHI Learning Private Limited,Delhi, 2022.
Reference Books	1. Traditional Knowledge System in India by Amit Jha Atlantic publishers, 2002. 2. Traditional Knowledge System in India, by Amit Jha, 2009.
Web. URLs	1. https://www.youtube.com/watch?v=LZP1StpYEPM 2. http://nptel.ac.in/courses/121106003/

Course designed by	**Verified by Chairman**
Dr. N Saranya	Dr. K Rajarajeswari

Course Code	Title	
22U4VBOE07	Value Based Open Elective Course : Principles of Intellectual Property Rights	
Semester: IV	Credits: 2	ESE: 50 Marks

Course Objective	To make the students to recognize the importance of IP and to educate the pupils on basic concepts of Intellectual Property Rights. To learn the procedure of obtaining Patents, Copyrights, Trade Marks & Industrial Design
Course Category	Entrepreneurship
Development Needs	Global
Course Description	The course is designed to provide comprehensive knowledge to students regarding the general principles of IPR, Concepts and Theories, Criticisms of Intellectual Property Rights, the registration process, and the International Regime Relating to IPR.

Course Outcomes		Teaching Methods
CO 1	Understand Intellectual Property Rights (IPR), its significance in promoting innovation and creativity, and the different types of IPRs.	Lecture
CO 2	Equip with the knowledge to navigate the patent filing process effectively.	Tutorial
CO 3	Comprehend the fundamentals of copyrights, their types, registration procedures, terms and remedies	Lecture
CO 4	Narrate the trademarks, their rights, types, purpose, registration process, and the trademark landscape in India	Tutorial
CO 5	Analyze the significance of geographical indications (GI) and the need for their protection, the relevant laws and regulations in India	Lecture

Course Content	Instructional Hours / Week : 2

Unit	Description	Text Book	Chapters
I	**Introduction to Intellectual Property Rights (IPR):** Definition of IPR, Importance of IPR, Kinds of Intellectual property rights: Copy Rights, Patent, Trade Mark, Trade Secret and trade dress, Design, Layout Design, Geographical Indication, Plant Varieties and Traditional Knowledge, IPR in India and the world, IPR and WTO.	1	1,2
		Instruction Hours	**6**
Suggested Learning Methods : Lecture/Tutorial			
II	**Patent:** Introduction to Patent, Patent Act 1970 and its amendments, Patentable and non-Patentable inventions, legal requirements for obtaining Patent, Registration Procedure of Patent, The role of Patentees and Different layers of the international patent system: National and International Patent filing procedures.	1	4
		Instructional Hours	**6**
Suggested Learning Methods : Lecture/Tutorial			
III	**Copyright**: Introduction to Copyrights, Origin, and Definition & Types of Copyrights, Registration procedure, Assignment & license, Terms of Copyright, Piracy, Infringement, Remedies, Copyrights with special reference to software, Copyrights in India.	1	
		Instructional Hours	**6**
Suggested Learning Methods : Lecture/Tutorial			

IV	**Trademarks:** Introduction to trademarks, Rights of trademark, Types of trademark, purpose, and function of a trademark, trademark protection, and trademark registration process, trademarks in India.	1	9
		Instructional Hours	**6**
Suggested Learning Methods : Lecture/Tutorial			
V	**Design:** Introduction to Design, Registration of Design, Cancellation of Registration, International Convention on Design, functions of Design, **Geo Graphical Indication:** Introduction to Geo Graphical Indication, Why and how GI needs protection and GI laws, Indian GI act.	1	7,10
		Instructional Hours	**6**
Suggested Learning Methods : Lecture/Tutorial			
		Total Hours	**30**

Text Book	**1.** Intellectual Property Rights, Asha Vijay DurafeDhanashree K. Toradmalle, Wiley Publisher, 2022
Reference Book	1. B.L. Wadera, Patents, trademarks, copyright, Designs and Geographical Judications.
Web. URLs	1. https://dst.gov.in/sites/default/files/E-BOOK%20IPR.pdf

Course designed by	**Verified by Chairman**
Dr. K Prathap Chandran	Dr. S Saraswathi

Course Code	Title	
22U4VBOE08	Value Based Open Elective Course : Science, Society and Culture	
Semester: IV	Credits: 2	ESE: 50 Marks

Course Objective	To create awareness on Science, Indian Society and cultural heritage of our Country
Course Category	Skill Development
Development Needs	Global
Course Description	Facilitate the awareness on Science in everyday life, Indian Society and Social empowerment, Democracy and Freedom of our Country. Ancient Civilization, cultural heritage and perceptions of Indian Culture

Course Outcomes		Teaching Methods
CO 1	Know the concepts of Science in our daily life and awareness about Scientific community	Lecture / Video Lessons / Model
CO 2	Gain knowledge on Indian society and development of modern society	Lecture / Video Lessons
CO 3	Learn about Indian social issues and awareness on our social laws	Lectures / Case study
CO 4	Understand the Indian culture, diversity of culture and Traditional customs	Tutorial / Group Discussion
CO 5	Comparison of ancient heritage and civilization of our country and follow them in our life	Lecture / Tutorial

Course Content — **Instructional Hours / Week : 2**

Unit	Description	Text Book	Chapters
I	**Common Science** - Developments and their applications- effects in day to day Life - Achievements of Indians in Science and Technology. Awareness in the fields of IT, Space, Computers, Robotics, Nanotechnology and Biotechnology. Scientists of Ancient India, Science and Scientists of Medieval India, Scientists of Modern India. India's Policy in the Field of the Science, Policies and Reports related to Science-Innovative Technology Vision.	1	1
		Instructional Hours	**6**
Suggested Learning Methods : Video Lectures			
II	**Social Behaviour** - Salient features of our Society-Social diversity of India-Impact of globalization on Indian society. Social empowerment, Democracy and Freedom-Role of women and women's organization in the development of healthy society.	2	1
		Instructional Hours	**6**
Suggested Learning Methods : Video Tutorials			
III	**National Integration** – Communalism - Regionalism and Secularism – Problems relating to development and management of Social Sector-Services relating to Health, Education and Human Resources. Welfare schemes for vulnerable sections of the people-Performance of Centre and States schemes-Mechanisms-Laws,	2	1 & 2

	Institutions and Bodies constituted for the protection and development of vulnerable sections.		
		Instructional Hours	**6**
Suggested Learning Methods : Group Discussion			
IV	**South Asian Cultures**-Indian culture-combination of several cultures-Indian philosophy-Religious culture-Family structure and marriage-Wedding rituals-Indian greetings-Indian foods- Festivals-Traditional clothing. Epics of India-Indian Arts and Music-Indian architecture and Sculptures-Indian Languages and Literature-Perceptions of Indian culture.	3	1
		Instructional Hours	**6**
Suggested Learning Methods : Video Tutorials			
V	**Ancient Civilization**-Indus Valley Civilization-Harappa and Mohenjo-Daro civilization-Evolutions of early Buddhist Architecture-Advent in China-Ellora caves civilization-King Gupta's period of civilization-Vijayanagara inscriptions-Mohall's period of civilization-British culture.	4	2
		Instructional Hours	**6**
Suggested Learning Methods : Online Tutorial			
		Total Hours	**30**

Text Books	1. Science, Culture and Society: Understanding Science in the 21st Century by Mark Erickson, Paperback – Illustrated, 2015. 2. Khanna, Indian Social order and Laws, Universities Press. 3. Choudhary, Social Protection Law Provisions and Procedure. 4. Indian Heritage systems-Universal Law Publishing Company. 5. Ancient Civilization of Indian sub-continent- Ancient Books.
Reference Books	1. National integration and Secularism: Issues and Challenges, Regal Publications. 2. Ancient Culture of India: Issues and Concerns.
Web. URLs	1. https://www.amazon.in/Science-Culture-Society-Understanding-Century-dp-0745662250/dp/0745662250/ref=dp_ob_title_bk. 2. https://iasscore.in/upsc-syllabus/indian-society/indian-society-mains. 3. https://www.worldhistory.org/india/

Course designed by	**Verified by Chairman**
Dr. K Narayanasamy	Dr. M Thangavel

Course Code	Title	
22U4VBOE09	Value Based Open Elective Course : Community Engagement	
Semester: IV	Credits: 2	ESE: 50 Marks

Course Objective	This course serves as an introduction to community engagement, helping learners to explore methods of community involvement, change making process, and professionalism within the community.
Course Category	Skill Development
Development Needs	National
Course Description	Apply the principles of communication for outreach to the diverse public, decision makers, and stakeholder groups.

Course Outcomes		**Teaching Methods**
CO 1	Apply professional behavior when working with community organizations	Lecture/ Case Study
CO 2	Investigate the complexity of problems related to community needs	Lecture/ Role Play
CO 3	Design and conduct the phases of a community engagement process, using consensus building and relating to formal planning procedures.	Lecture/ Case Study
CO 4	Recognize community interests, power dynamics, and conflict, and facilitate empowerment of excluded groups and negotiation	Lecture/ / Role Play
CO 5	Direct cross-jurisdictional, inter-agency, inter-disciplinary, and multi-stakeholder collaboration.	Lecture/ Case Study

Course Content	**Instructional Hours / Week : 2**

Unit	Description	Text Book	Chapters
I	Concept, Ethics and Spectrum of Community engagement, Local community, Rural culture and Practice of community engagement	3	2
		Instructional Hours	**6**
Suggested Learning Methods : Seminar			
II	Rural Development Programs and Rural institutions, Local Administration and Community Involvement	2	3
		Instructional Hours	**6**
Suggested Learning Methods : Role Play			
III	Stages, Components and Principles of community development, Utility of public resources. Social contribution of community networking, Various government schemes.	1	3
		Instructional Hours	**6**
Suggested Learning Methods : Role Play			

IV	Community Engaged Research and Ethics in Community Engaged Research. PRA, Programmes of community engagement and their evaluation.	1	2
		Instructional Hours	**6**
Suggested Learning Methods : Creative Art Assignments			
V	Rural Distress, Rural Poverty, Impact of Disasters on Migrant Laborers, Mitigation of Disaster.	2	1
		Instructional Hours	**6**
Suggested Learning Methods : Community Participation Program			
		Total Hours	**30**

Text Books	1. Participatory Rural Appraisal, PRA Application in Rural Development Planning, R Ramesh 2. Introduction to Community Development, Theory, Practice, and Service-Learning, Gary Paul Green, Jerry W. Robinson, Jr, 2011, SAGE Publications
Reference Books	1. Community-based participatory research: a capacity-building approach for policy advocacy aimed at eliminating health disparities. Am J Public Health. 2010 2. Achieving successful community engagement: A rapid realist review. BMC Health Services Research.
Web. URLs	1. https://unnatbharatabhiyan.gov.in › presentations 2. https://www.wellawareworld.org/

Course designed by	**Verified by Chairman**
Narmadha Veroniha T	Dr. P Nathiya

Course Code	Title	
22U4VBOE10	Value Based Open Elective Course : Emotional Intelligence	
Semester: IV	Credits: 2	ESE: 50 Marks

Course Objective	To enable the Students to understand the concepts of Emotional Intelligence, its models and components
Course Category	Employability & Skill Development
Development Needs	National & Global
Course Description	Understanding the importance of Emotional Intelligence and build effective relationships

Course Outcomes		Teaching Methods
CO 1	Understand the Self-Awareness, Self-Management, Social Awareness and Relationship Management	Lecture/ Video Lectures
CO 2	Discover personal competence and techniques of building emotional intelligence.	Lecture/ Role Play
CO 3	Narrate the insights into establishing positive relationships	Lecture/ Peer Teaching
CO 4	Understand the emotional intelligence and its importance	Lecture/ Role Play
CO 5	Summarize the Self-Management Techniques	Lecture/ Group Discussion

Course Content — **Instructional Hours / Week : 2**

Unit	Description	Text Book	Chapters
I	**Fundamentals of Emotional Intelligence**: Meaning Definition Nature and Significance Models of Emotional Intelligence-: Ability, Trait and Mixed Building blocks of emotional intelligence: Self-awareness, Self-Management, Social Awareness, and Relationship Management	1	1&2
	Instructional Hours		**6**
Suggested Learning Methods : Video lectures			
II	**Personal Competence:** Meaning Definition Self Awareness: Observing and recognizing one's own feelings, Knowing one's strengths and areas of development. Self-Management: Managing emotions, anxiety, fear, and anger.	1	5&6
	Instructional Hours		**6**
Suggested Learning Methods : Role Play			
III	**Social Competence**: Social Awareness: Others' Perspectives, Empathy and Compassion Relationship Management: Effective communication, Collaboration, Teamwork and Conflict Management	2	1&2
	Instructional Hours		**6**
Suggested Learning Methods : Peer Teaching			
IV	**Emotional Intelligence:** Measurement and Development - Meaning Definition, Importance	2	4&5

	Measures of emotional intelligence Strategies to develop and enhance Emotional Intelligence		
		Instructional Hours	**6**
Suggested Learning Methods : Role Play			
V	**Self-Management Techniques**: Meaning Definition Techniques to regulate emotions such as Mindfulness, Conditioned relaxation response and Boundary setting Techniques of Relationship Management: Display of empathy, Effective Communication , Teamwork , Conflict resolution	2	6&7
		Instructional Hours	**6**
Suggested Learning Methods : Group Discussion			
		Total Hours	**30**

Text Books	1. Bar-On, R., & Parker, J.D.A.(Eds.) (2000). The handbook of emotional intelligence. San Francisco, California: Jossey Bros. 2. Goleman, D. (2005). Emotional Intelligence. New York: Bantam Book. 3. Sternberg, R. J. (Ed.). (2000). Handbook of intelligence. Cambridge University Press.
Reference Books	1. HBR's 10 Must Reads on Emotional Intelligence (2015) 2. HBR's 10 Must Reads on Managing Yourself (2011) 3. Self-Discipline: Life Management, Kindle Edition, Daniel Johnson.

Course designed by	**Verified by Chairman**
Dr. R A Ayyapparayan	Dr. R A Ayyapparayan

Course Code	Title	
22U4VBOE11	Value Based Open Elective Course : Fundamentals of Tourism	
Semester: IV	Credits: 2	ESE: 50 Marks

Course Objective	To impart Knowledge on Tourism and its development in the economic growth and also to identify the tourist needs.
Course Category	Employability
Development Needs	Global
Course Description	To enhance the students to get part in the tourism industry and to know about concepts of tourism.

Course Outcomes		Teaching Methods
CO 1	Understand tourism and its development	Direct Instruction
CO 2	Analyse the Factors influencing the Travel Motivations.	Direct Instruction
CO 3	Comprehend the Tourist Transport	Video Lessons
CO 4	Understand the Tourist Accommodations	Direct Instruction
CO 5	Apply the Travel Agency Operations	Video Lessons

Course Content — **Instructional Hours / Week : 2**

Unit	Description	Text Book	Chapters
I	**The Tourism Phenomenon:** Definition – Tourism; Tour; Tourist; Visitor; Excursionist; Domestic; International; Inbound; Outbound; Destination. Growth of Tourism / Evolution / History of Tourism & Present status of tourism in India. Thomas Cook – Grand Circular Tour.	1	9, Key Terms
		Instructional Hours	**6**
Suggested Learning Methods : Lecture Based Learning			
II	**Travel Motivations:** ***Categories of Motivations:*** Physical Motivators, Cultural Motivators, Interpersonal Motivators, Status and prestige Motivators. ***Types of Tourism:*** Pleasure, relaxation, Rest and recreation, Health, Participation in Sports, Curiosity and Culture, Ethnic and Family, Spiritual and Religious, Professional or Business.	1	3
		Instructional Hours	**6**
Suggested Learning Methods : Group Learning Method			
III	**Tourist Transport:** Role of Transport in Tourism, Modes of Transport, Road Transport, Air Transport, Rail Transport, Sea Transport.	2	15
		Instructional Hours	**6**
Suggested Learning Methods : Group Learning Method			
IV	**Tourist Accommodation:** Definition, Types of Hotels, International Hotels, Resort Hotels, Commercial Hotels, Residential Hotels, Floating Hotels. **Supplementary Accommodation:** Motel, Youth Hostel, Camping Sites, Pension, Bed and Breakfast Establishment, Tourist Holiday Villages, Time and Resort Condominiums.	1	8
		Instructional Hours	**6**
Suggested Learning Methods: Group Learning Method			

V	**Travel Agency:** Products of Travel Agency, Classification of Travel Agency, Functions, Travel Related Business, International Travel Requirements, Travel Agency Operations.	3	2,3
		Instructional Hours	**6**
Suggested Learning Methods: Lecture Based Learning			
		Total Hours	**30**
Text Books	1. A.K. Bhatia, Tourism Development: Principles & Practices, Sterling Publishers Pvt 2007. 2. A.K. Bhatia, International Tourism Management, Sterling Publishers Pvt 2012. 3. Jagmohan Negi, Travel Agency Operations Concepts and Principles, Kanishka Publishers and Distributors, 2003.		
Reference Books	1. Biswanth Gosh, Tourism & travel management, Vikas Publishing House, Second Edition, 2008. 2. Christopher Holloway, Business of tourism, Elsevier Publisher, Second Edition, 2006.		

Course designed by	**Verified by Chairman**
B Tamil Selvan	B Tamil Selvan

Course Code	Title	
22U4VBOE12	Value Based Open Elective : Health Education	
Semester: IV	Credits: 2	ESE: 50 Marks

Course Objective	1. Acquire knowledge on different dimensions of health. 2. Inbuilt healthy life style practices
Course Category	Value education
Development Needs	Local
Course Description	It provides knowledge on values and practices for healthy living

Course Outcomes		Teaching Methods
CO 1	Recall the importance of health education	Interactive session
CO 2	Enlist the right choice of foods and dietary pattern	Interactive session
CO 3	Identify methods to manage mental health issues	Activity based teaching
CO 4	Practice effective personal health habits	Interactive session
CO 5	Summarize the importance of environmental health for mankind	Interactive session

Course Content — **Instructional Hours /Week : 2**

Unit	Description	Text Book	Chapters
I	**Health Education:** Concept of health, Components of wellness, spectrum and determinants of health - Definition of health-health education-Aim, objective and principles of health education - Health services, Related Activity -Measuring the health attitudes of students	1	1
		Instructional Hours	**6**
Suggested Learning Methods: Group Activity			
II	**Food and Health** Basic 4, 5and7 food groups; functional food groups-energy yielding, body building and protective foods (only sources and functions), food pyramid, meal planning pattern, healthy eating pattern.Related Activity -Assessing dietary adequacy of students	3,4	1 & 1, 2
		Instructional Hours	**6**
Suggested Learning Methods: Peer learning			
III	**Mental Health** Meaning of mental health – importance of mental health-characteristics of emotionally healthy-Self esteem-Values and patterns in decision making- Mental health problem of adolescences – depression & stress -causes and management Related activity-Stress level assessment in students	1	6
		Instructional Hours	**6**
Suggested Learning Methods: Role play			

IV	**Personal Health** Definition of personal health- under nutrition and over nutrition -prevalence of life style disease-healthy lifestyle practices- personal hygiene-Importance of physical activities & exercise Related Activity -Analyzing the physical activity pattern of students	1	8
		Instructional Hours	**6**
Suggested Learning Methods: Assignment			
V	**Environment and Health** Definition of environmental health, Biodiversity, climate change and biodiversity, environmental pollution-causes and consequences of air, water and soil pollution-Food contamination and consequences Related Activity-Group discussion on case studies	2	5,8
		Instructional Hours	**6**
Suggested Learning Methods: Group Discussion			
		Total hours	**30**

Text Books	1. Anspaugh (2001), Teaching Today's Health, Library of Congress Cataloging, 6th Edition, US 2. Tyler Miller (2006), Environmental Science, Cengage learning India private ltd 3. Srilakshmi (2010), Dietetics, New age International private limited, New Delhi 4. Srilakshmi (2010), Food Science, New age International private limited, New Delhi
Reference Books	1. Howley & Don Franus(B) (2003) Health Fitness Instructor's Handbook. Human Kinetics publication. 2. Ramachandran. L. Dharmalingam. T (1993) Health Education India. Vikas publishing House Private Limited
Journals	1. Health education

Course designed by	**Verified by Chairman**
Dr A Swarnalatha	Dr A Swarnalatha

Course Code	Title	
22U4VBOE13	Value Based Open Elective Course : Media and Politics	
Semester: IV	Credits: 2	ESE: 50 Marks

Course Objective	To Impart knowledge of understanding the media and politics
Course Category	Skill Development
Development Needs	Global
Course Description	This course examines how media and political institutions interact to shape public thinking and debates around social problems.

	Course Outcomes	Teaching Methods
CO 1	Understand the basic idea of media and Politics	Lecture and Demonstration
CO 2	Summarize the political stance of media.	Lecture
CO 3	Apply the Skills on writing political news.	Lecture and Demonstration
CO 4	Evaluate the various characteristics of media Organization.	Video Lectures
CO 5	Apply the mass media influences as individuals, groups, and society in political contexts	Discussion

Course Content **Instructional Hours / Week : 2**

Unit	Description	Text Book	Chapters
I	Media –- Meaning and importance. Role of media in Society Political Communication – Mass Media politics and Society- Cinema and political manifestation. Social media and Political narration	1	1
		Instructional Hours	**06**
Suggested Learning Methods : Learning by Teaching			
II	Characteristics of Modern Mass Media: Print and Electronic Media – Political economy and Ownership	2	2
		Instructional Hours	**06**
Suggested Learning Methods : Active Learning			
III	Political Economy - State ownership versus private ownership of mass media – Consequences of private and public- Media ownership pattern Government Regulation – Monopoly- Media content and its Censorship.	1	2
		Instructional Hours	**06**
Suggested Learning Methods : Group Learning			
IV	Public Opinion- The relationship between the mass media and public sphere- Political manipulation of media content- the impact of mass media on global political processes.	3	3
		Instructional Hours	**06**
Suggested Learning Methods : Visual Learning			
V	Political effects of Mass Media: Individual- group- and Society Public- making public opinion- Setting of Political agenda-	2	4

	Political Socialization- Political mobilization		
		Instructional Hours	**06**
Suggested Learning Methods : Case study based Learning			
		Total Hours	**30**
Text Books	1. Lowe, L. (2016). The Definitive Guide to Creative Writing and Media Productions. United States: Xlibris UK. 2. Marshall, C. (2018). Writing for Social Media. United Kingdom: BCS Learning & Development Limited. 3. Cain, S., Batty, C. (2016). Media Writing: A Practical Introduction. United Kingdom: Palgrave Macmillan.		
Reference Books	1. Mencher, Melvin."Basic News Writing" Universal Bookstall, New Delhi.1993. 2. Sreenivas Rao. Academic Book Centre, Ahmedabad. 1981. 3. Barnard, J. (2019). The Multimodal Writer: Creative Writing Across Genres and Media. United Kingdom: Bloomsbury Academic. 4. Kuehn, S. A., Lingwall, J. A. (2016). The Basics of Media Writing: A Strategic Approach. United States: SAGE Publications.		
Web. URLs	1. https://www.bing.com/videos/		

Course designed by	**Verified by Chairman**
R Baiju Paul	R Baiju Paul

Course Code	Title	
22U4VBOE14	Value Based Open Elective : Positive Psychology and Work Life	
Semester: IV	Credits: 2	ESE: 50 Marks

Course Objective	To bring an experience marked by predominance of positive emotions and informing them about emerging paradigm of Positive Psychology
Course Category	Skill Development
Development Needs	National
Course Description	Build relevant competencies for experiencing and sharing happiness as lived experience and its implications

Course Outcomes		Teaching Methods
CO 1	Understand the realities of Psychology and Work life	Lecture/ Case Study
CO 2	Insight on origin and development of Positive Psychology	Lecture/ Role Play
CO 3	Reveal the knowledge about phases of Positive Psychology	Lecture/ Case Study
CO 4	Perceptiveness about Happiness in Psychology and its Traits	Lecture/ Role Play
CO 5	Furnish the specific skills and techniques for working with Trust and Companionship	Lecture/ / Role Play

Course Content		Instructional Hours / Week : 2	
Unit	**Description**	**Text Book**	**Chapters**
I	Introduction to Positive Psychology : Positive Psychology: Concept, History, Nature, Dimension and scope of Positive Psychology Seligman's PERMA	3	1
		Instructional Hours	**6**
Suggested Learning Methods : Seminar			
II	Positive Emotional States and Processes, Positive Emotions and well being: Hope & Optimism, Love, The Positive Psychology of Emotional Intelligence, Influence of Positive Emotions	2	3
		Instructional Hours	**6**
Suggested Learning Methods : Role Play			
III	Strengths and Virtues : Character Strengths and Virtues Resilience in the phase of challenge & Loss, Empathy and Altruism	1	3
		Instructional Hours	**6**
Suggested Learning Methods : Role Play			
IV	Happiness : Introduction to Psychology of happiness, well being and scope, Types of happiness- Eudaimonic and Hedonic History of Happiness, Theories, Measures and Positive correlates of happiness, Traits associated with Happiness, Setting Goals for Life and Happiness	3	2
		Instructional Hours	**6**
Suggested Learning Methods : Creative Art Assignments			

V	**Forgiveness and Gratitude** : Forgiveness and Gratitude , Personal transformation and Role of suffering , Trust and Compassion	1	3
		Instructional Hours	**6**
Suggested Learning Methods : Community Participation Program			
		Total Hours	**30**
Text Books	1. Argyle, M. 1987. *The psychology of happiness.* London: Methuen. 2. Carr, Alan (2007). Positive Psychology: The science of human happiness and human strengths. Routledge, Taylor and Francis Group-London. Csikzentmihalyi, Mihaly (1990) Flow: The Psychology of Optimal Experience, Harper Perennial. 3. Garcia,Hector., & Mirrales. Francesc.(2017) IKIGAI-The Japanese Secret to a Long and Happy Life, Hutchinson London.		
Reference Books	1. Frankl, Viktor E. (1988). The Will to Meaning: Foundations and Applications of Logotherapy. Meridian/Plume 2. Frankl, Viktor E. (2000) Man's Search for Ultimate Meaning, Basic Books. 3. Snyder, C. R., & Lopez, S. J., & Pedrotti, J. T (2011) Positive Psychology: The Scientific and Practical Explorations of Human Strengths, Sage Publications India Pvt Ltd.		

Course designed by	**Verified by Chairman**
Lidya	Dr. P Nathiya

Course Code	Title	
22U4VBOE15	Value Based Open Elective Course : Professional Ethics	
Semester: IV	Credits: 2	ESE: 50 Marks

Course Objective	Students will understand the importance of Values and Ethics in their personal lives and Professional careers
Course Category	Employability & Skill Development
Development Needs	National & Global
Course Description	Understanding the importance of maintaining Professional Ethics and build effective career.

Course Outcomes		**Teaching Methods**
CO 1	Understand the basic purpose of Profession	Lecture
CO 2	Summarize the Professional Rights And Responsibilities	Lecture/ Peer Teaching
CO 3	Apply the various Roles in Applying Ethical Principles at Various Professional Levels	Lecture/ Case Study
CO 4	Professional Ethical Values and Contemporary Issues	Lecture/ Role Play
CO 5	Excelling in Competitive and Challenging Environment to Contribute to Industrial Growth.	Lecture/ Group Discussion

Course Content	**Instructional Hours / Week : 2**

Unit	Description	Text Book	Chapters
I	**Introduction to Professional Ethics: Meaning Definition Basic Concepts** Governing Ethics, Personal & Professional Ethics, Life Skills, Emotional Intelligence Profession and professionalism, Professional Associations, Professional Risks, Professional Accountabilities, Professional Success, Ethics and Profession.	1	1&2
	Instructional Hours		**6**
Suggested Learning Methods : Video lectures			
II	**Basic Theories:** Basic Ethical Principles, Moral Developments, Deontology Virtue Theory, Rights Theory, Casuist Theory, Moral Absolution, Moral Rationalism, Moral Pluralism Ethical Egoism, Feminist Consequentialism, Moral Issues, Moral Dilemmas, Moral Autonomy	1	5&6
	Instructional Hours		**6**
Suggested Learning Methods : Mini Case Analysis			
III	**Professional Practices:** Professions and Norms of Professional	2	1&2

	Conduct, Norms of Professional Conduct vs. Profession Responsibilities, Obligations and Moral Values in Professional Ethics, Professional codes of ethics The Centrality of Responsibilities of Professional Ethics; lessons from 1979 American Airlines DC-10 Crash and Kansas City Hyatt Regency Walk away Collapse.		
		Instructional Hours	**6**
Suggested Learning Methods : Group Discussion			
IV	Ethics in changing domains of Research: The US government wide definition of research misconduct, research misconduct distinguished from mistakes and errors, recent history of attention to research misconduct The emerging emphasis on understanding and fostering responsible conduct, responsible authorship, reviewing & editing.	2	4&5
		Instructional Hours	**6**
Suggested Learning Methods : Role Play			
V	Global issues in Professional Ethics: Introduction – Current Scenario, Technology Globalization of MNCs, International Trade, World Summits, Issues Business Ethics and Corporate Governance, Sustainable Development Ecosystem, Energy Concerns, Ozone Deflection, Pollution, Ethics in Manufacturing and Marketing Media Ethics; War Ethics; Bio Ethics, Intellectual Property Rights	2	6&7
		Instructional Hours	**6**
Suggested Learning Methods : Group Discussion			
		Total Hours	**30**

Text Books	1. Professional Ethics: R. Subramanian, Oxford University Press, 2015. 2. Ethics in Engineering Practice & Research, Caroline Whitbeck, 2e, Cambridge University Press, 2015
Reference Books	1. Business Ethics concepts & Cases: Manuel G Velasquez, 6e, PHI, 2008

Course designed by	**Verified by Chairman**
Dr. R A Ayyapparayan	Dr. R A Ayyapparayan

Course Code	Title	
22U4VBOE16	Value Based Open Elective Course : Science of Happiness	
Semester: IV	Credits: 2	ESE: 50 Marks

Course Objective	To explore the key elements of happiness at work and strategies to cultivate joy, well-being, and productivity in the workplace, relationship between happiness and various work-related factors, such as efficiency, creativity, innovation, work-life balance, and making a difference for others.
Course Category	Skill Development
Development Needs	Global
Course Description	To create a positive work environment and promote happiness for themselves and others.

Course Outcomes		Teaching Methods
CO 1	Understand the Happiness as a Scientific Construct	Lecture Method
CO 2	Apply the Theories and Models of Well-being	Flipped Teaching
CO 3	Demonstrate the Individual Factors and Happiness	Lecture Method
CO 4	Analyze the Social and Environmental Factors in Happiness	Lecture Method
CO 5	Apply Happiness and Work Efficiency	Flipped Teaching

Course Content — **Instructional Hours / Week : 2**

Unit	Description	Text Book	Chapters
I	**Introduction to Happiness as a Scientific Construct** Defining happiness and its importance in individual and societal well-being, Overview of subjective well-being and its components - life satisfaction, positive emotions, and negative emotions, Exploration of cultural variations in happiness and its measurement	1	1
	Instructional Hours		**6**
Suggested Learning Methods : Group Discussion			
II	**Theories and Models of Well-being** Prominent theories of well-being - hedonic well-being, eudemonic well-being, PERMA model. Role of factors - autonomy, meaning, and engagement in happiness. Strengths and limitations of different well-being models	1	2
	Instructional Hours		**6**
Suggested Learning Methods : Group Discussion			
III	**Individual Factors and Happiness** Personality traits - optimism, resilience and their influence on happiness. Role of genetics and biological factors in determining happiness levels. Examination of personal values, goals, and self-esteem and their impact on subjective well-being	1	3
	Instructional Hours		**6**
Suggested Learning Methods : Group Discussion			
IV	**Social and Environmental Factors in Happiness** Importance of social relationships and social support in	1	4

	promoting happiness. Influence of social comparison, social norms, and cultural factors on well-being. Impact of environmental factors - access to nature, quality of living conditions on happiness.		
		Instructional Hours	**6**
Suggested Learning Methods : Group Discussion			
V	**Happiness and Work Efficiency** Impact of happiness on work efficiency and productivity, strategies for managing daily hassles and reducing stress in the workplace, link between happiness and creativity in the workplace, Strategies for fostering a creative and innovative work environment	1	5
		Instructional Hours	**6**
Suggested Learning Methods : Group Discussion			
		Total Hours	**30**

Text Books	1. Susan A. David, IlonaBOni well, and Amanda Conley Ayers; The Oxford Hand book of Happiness.
Reference Books	1. Achor, S. (2010). The happiness advantage: The seven principles of positive psychology that fuel success and performance at work. Random House. 2. Lyubomirsky, S. (2008). The how of happiness: A scientific approach to getting the life you want. Penguin. 3. Diener, E., & Seligman, M. E. P. (2002). Very happy people. Psychological Science, 13(1), 81-84.
Web. URLs	1. https://onlinecourses.nptel.ac.in/noc23_hs06/preview

Course designed by	**Verified by Chairman**
Dr. S Balaji	Dr. K Rajarajeswari

Course Code	Title		
23U3DTC508	Core XII: Machine Learning		
Semester: V	Credits: 3	CIA: 20 Marks	ESE:55 Marks

Course Objective	This course presents the foundations of learning, linear models, clustering, tree and rule-based model and reinforcement learning. It enables the student to learn techniques in machine learning.
Course Category	Skill Development
Development Needs	Global
Course Description	To understand the types of Multivariate Method, Decision Tree, Kernel Machines, Reinforcement Learning of Machine learning.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	To understand the basic concept of Machine Learning Techniques	Lecture	Group Discussion
CO 2	To analyze the standards in Machine Learning Techniques	Tutorial	Quiz
CO 3	To study the functions of various algorithm used in Machine Learning Techniques	Demonstration	Seminar
CO 4	To familiarize with the different technique in Machine Learning Techniques	Video Lessons	Assignment
CO 5	To analyze the applications of Machine Learning Techniques	Video Lessons	Seminar

Offered by	**Computer Science(Data Science)**

Course Content	Instructional Hours / Week : 5

Unit	Description	Text Book	Chapters
I	**Introduction :** Introduction to Machine Learning-Examples of ML Application-Vapnik-Chervonenkis Dimension-Learning Multiple Classes-Dimension of a Supervised Machine Learning Algorithm-Bayesian Decision Theory Introduction-Classification-Losses and Risk-Association Rule-Maximum Likelihood Estimation.	1	1, 2, 3, 4
		Instructional Hours	**15**
Suggested Learning Methods : Write simple Machine Learning Algorithms			
II	**Multivariate Method-** Multivariate Data-Parameter Estimation-Multivariate Normal Distribution-Multivariate Classification-Singular Value Decomposition and Matrix Factorization-Multidimensional Scaling-Linear Discriminant Analysis-Canonical Correlation Analysis **Clustering-** Mixture Density- k-Means Clustering-Expectation-Maximization Algorithm-Supervised Learning after Clustering-Spectral Clustering-Hierarchical Clustering	1	5.6,7
		Instructional Hours	**15**
Suggested Learning Methods : Write Algorithms for Real time Scenario			
III	**Decision Tree-** Introduction-Univariate Tree-Pruning-Rule	1	9, 10,

	Extraction from Trees-Learning Rules from Data-Multivariate Trees-**Linear Discrimination Introduction-** Generalizing the Linear Model-Geometry of the Linear Discriminant-Pairwise Separation-Parametric Discrimination Revisited-Gradient Descent-Logistic Discrimination-Discrimination by Regression-Multilayer Perceptrons-Backpropagation Algorithm-Training Procedure		11
		Instructional Hours	**15**
Suggested Learning Methods : Group Discussion			
IV	**Kernel Machines-** Optimal Separating Hyperplane- v-SVM-Kernel Trick-Vectorial Kernels-Multiple Kernel Learning-Multiclass Kernel Machines-Kernel Machine for Regression-One Class Kernel Machines. Discrete Markov Process-Hidden Markov Models-Finding the state sequence-Learning Model Parameters-The HMM as a Graphical Model.	1	13,15
		Instructional Hours	**15**
Suggested Learning Methods : Seminar			
V	**Reinforcement Learning-** Introduction –Single state case-Element of Reinforcement Learning-Model Based Learning-Temporal Difference Learning-Generalization-Partially Observable State. **Design and Analysis of Machine Learning Experiment-** Factors, Response and Strategy of Experiment-Response Surface Design-Randomization, Replication and Blocking-Guidelines of Machine Learning Experiment-Cross Validation and Resampling methods-Measuring Classifier Performance-Interval Estimation-Hypothesis Testing-Assessing a Classification Algorithm's Performance	1	18,19
		Instructional Hours	15
Suggested Learning Methods : Video Presentation			
		Total Hours	**75 Hrs**

Text Books	Introduction To Machine Learning by Ethem Alpaydin 3rd Edition
Reference Books	Introduction to Machine Learning by Alex Smola and S.V.N. Vishwanathan published by the press Syndicate of the University of Cambridge

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO 5
CO1	H	H	L	M	H	L	M	H	H	H	H	M	M
CO2	H	H	L	M	H	L	M	H	H	H	H	M	M
CO3	H	H	L	M	H	L	M	H	H	H	H	H	H
CO4	H	H	L	M	H	L	M	H	H	H	H	H	H
CO5	H	H	L	M	H	L	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Dr. N. KAVITHA	Dr. N. KAVITHA

Course Code	Title		
23U3DTC509	Core Paper XIII: Introduction to Artificial Intelligence		
Semester: V	Credits: 4	CIA: 25 Marks	ESE:75 Marks
Course Objective	To enable the students to understand the Artificial Intelligence as a Problem-Solving technique.		
Course Category	Skill Development		
Development Needs	Global		
Course Description	To understand the concepts of Problem Solving, Knowledge and Reasoning, Planning and Learning of Artificial Intelligence		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Knowledge about overview of Artificial Intelligence	Lecture	Group Discussion
CO 2	Gain Knowledge about Problem Solving methods	Tutorial	Quiz
CO 3	Acquire Knowledge representation and its working principle	Demonstration	Seminar
CO 4	Analyze use of reasoning methods by constructing plans	Video Lessons	Seminar
CO 5	Implement the methods of Knowledge Generation using Learning	Demonstration	Assignment

Offered by	Computer Science(Data Science)

Course Content	Instructional Hours / Week : 5

Unit	Description	Text Book	Chapters
I	**Introduction:** Introduction to AI - The foundation of AI- AI Problems. Intelligent Agent: Introduction-How Agent should act- Structure of Intelligent Agent	1	1, 2
		Instructional Hours	**15**
Suggested Learning Methods : Write Algorithms for Real time Scenario			
II	**Problem Solving by searching:** Problem Solving Agents- Formulating Problems-Examples: 8 queens problem. Search Strategies- Game Playing: Minim ax-Alpha-Beta Pruning.	1	3,5
		Instructional Hours	15
Suggested Learning Methods : Practice using Flow Charts			
III	**Knowledge and Reasoning:** A Knowledge based agent- Representation, Reasoning and Logic. Propositional Logic-Very simple Logic- Introduction to First Order Logic.	1	6,7
		Instructional Hours	15
Suggested Learning Methods : Group Discussion			
IV	**Planning:** A simple planning agent – From Problem solving to Planning – Basic Representation of Planning – A partial Order Planning Algorithm- Example**.**	1	11
		Instructional Hours	15

Suggested Learning Methods : Group Learning			
V	**Learning:** A General model of Learning Agent – Inductive Learning – Learning from Decision Trees.	1	18
		Instructional Hours	15
Suggested Learning Methods : Video Presentation			
		Total Hours	75 Hrs
Text Books	1. Stuart J.Russell, Peter Norvig, "Artificial Intelligence – A Modern Approach", Prentice Hall Incorporation. 2.Elaine Rich, Kevin Knight, Shivasankar B.Nair, "Artificial Intellignence", Third Edition, Tata-McGraw, 2009		
Reference Books	Deepak Khemani, "A First course in Artificial Intelligence", McGraw Hill Education Pvt Ltd, 2013.		

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
5	5	6	3	3	3	25

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	L	M	H	L	M	H	H	H	H	M	M
CO2	H	H	L	M	H	L	M	H	H	H	H	M	M
CO3	H	H	L	M	H	L	M	H	H	H	H	H	H
CO4	H	H	L	M	H	L	M	H	H	H	H	H	H
CO5	H	H	L	M	H	L	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Dr. N. KAVITHA	Dr. N. KAVITHA

Course Code	Title		
23U3DTC510	Core Paper XIV: Data Visualization		
Semester: V	Credits: 3	CIA: 20 Marks	ESE: 55 Marks

Course Objective	To understand the significance of data, analyzing and reasoning about data through visualizations makes complex data more accessible, understandable and usable.
Course Category	Skill Development
Development Needs	Global
Course Description	To understand the Data Visualization concepts, Technology Fundamentals, Drawing with Data and Scales in Pixels.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understanding Data visualization and its relationships	Lecture	Group Discussion
CO 2	Exploring various data visualization techniques	Flipped Classroom	Quiz
CO 3	Understanding the basics of D3	Tutorial	Seminar
CO 4	Creating effective visualizations	Video Lessons	Seminar
CO 5	Generating web-based visualizations using D3	Case Study	Assignment

Offered by	**Computer Science(Data Science)**

Course Content	Instructional Hours / Week : 4

Unit	Description	Text Book	Chapters
I	**Data Visualization:** Introduction – Need of coding and interaction on the Web - Using Sample Code to introduce D3 - Dos and Don'ts of D3 - Origins and Context- Alternatives - Easy Charts- Graph Visualizations – Geomapping -Almost from Scratch - Three-Dimensional - Tools built with D3.	1	1, 2
		Instructional Hours	**12**
Suggested Learning Methods : Write Code for Graph Visualization			
II	**Technology Fundamentals:** The Web- HTML -Content Plus Structure-Adding Structure with Elements -Common Elements-Attributes-Classes and IDs -Comments-DOM -Developer Tools-Rendering and the Box Model-CSS-Selectors -Properties and Values-Comments-Referencing Styles-Inheritance, Cascading, and Specificity-JavaScript -Hello, Console -Variables-Other Variable Types-Arrays -Objects -Objects and Arrays -Mathematical Operators -Comparison Operators -Logical Operators -Control Structures -Functions -Comments -Referencing Scripts -JavaScript Gotchas -SVG -The SVG Element -Simple Shapes -Styling SVG Elements -Layering and Drawing Order -Transparency -A Note on Compatibility.	1	3
		Instructional Hours	12
Suggested Learning Methods : Learn Online Tutorials			
III	**Setup:** Downloading D3 - Referencing D3 -Setting Up a Web	1	4,5

	Server -Terminal with Python -MAMP, WAMP, and LAMP - Diving in Data - Generating Page Elements -Chaining Methods - One Link at a Time -The Handoff -Going Chainless -Binding Data -In a Bind -Data -Please Make Your Selection-Bound and Determined -Using Your Data -High-Functioning -Data Wants to Be Held -Beyond Text.		
		Instructional Hours	12
Suggested Learning Methods : Seminar			
IV	**Drawing with Data:** Drawing divs -Setting Attributes -A Note on Classes -Back to the Bars - Setting Styles -The Power of data() - Random Data -Drawing SVGs -Create the SVG -Data-Driven Shapes -Pretty Colors, Making a Bar Chart -The Old Chart -The New Chart-Color -Labels -Making a Scatterplot -The Data -The Scatterplot -Size -Labels.	1	6
		Instructional Hours	12
Suggested Learning Methods : Group Discussion			
V	**Scales:** Apples and Pixels-Domains and Ranges -Normalization-Creating a Scale - Scaling the Scatterplot - d3.min() and d3.max() -Setting Up Dynamic Scales - Incorporating Scaled Values - Refining the Plot -Other Methods -Other Scales -Square Root Scales -Time Scales Axes: Introducing Axes -Setting Up an Axis -Positioning Axes -Check for Ticks -Y Not? -Final Touches-Formatting Tick Labels -Time-Based Axes.	1	7,8
		Instructional Hours	12
Suggested Learning Methods : Video Presentation			
		Total Hours	60 Hrs

Text Books	Scott Murray, **"Interactive Data Visualization for the Web",** O'Reilly Media, Inc, 2013
Reference Books	1. Andy Kirk, "**Data Visualization A Handbook for Data Driven Design",** Sage Publications, 2016 2. Colin Ware **"Information Visualization Perception for Design"**,3rd edition, Morgan Kaufman 2012.

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
4	4	5	2	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	L	M	H	L	M	H	H	H	H	M	M
CO2	H	H	L	M	H	L	M	H	H	H	H	M	M
CO3	H	H	L	M	H	L	M	H	H	H	H	H	H
CO4	H	H	L	M	H	L	M	H	H	H	H	H	H
CO5	H	H	L	M	H	L	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
D. J. ANITHA MERLIN	Dr. N. KAVITHA

Course Code	Title		
23U3DTP511	Core Paper XV: Practical in Machine Learning		
Semester: V	Credits: 4	CIA: 40 Marks	ESE:60 Marks

Course Objective	To make the students understand the different algorithms in Machine Learning Using R Language and develop familiarity in the same.
Course Category	Employability
Development Needs	Global
Course Description	To development skill set in Machine Learning and apply the concepts to develop applications in order to meet the Local and Global needs

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	List and apply basic concept in Machine Learning Using R Language	Program Demonstration	Program Development
CO 2	Classify the concept of Clustering in Machine Learning	Program Demonstration	Debugging
CO 3	Apply the Multivariate concept in Machine Learning Using R Language	Program Demonstration	Application of Logic
CO 4	Utilize concept OF Linear Discrimination in Machine Learning Using R Language	Program Demonstration	Program Creativity
CO 5	Develop small Projects in Machine Learning Using R Language	Program Demonstration	Program Development

Offered by	**Computer Science(Data Science)**
Course Content	**Instructional Hours / Week : 5**

Program List

1. Create a ML model for aviation incident risk prediction
2. Create a Classification of ransomware families
3. Create a Activity prediction system
4. Create a Electricity usage minimizing system for water pumps
5. Create a Music cognition system
6. Create a Intrusion detection system
7. Create a Personalized Market Basket Prediction
8. Create a Performance prediction system for mobile networks

9. Create a Stock price index forecasting system
10. Create an Intelligent asset allocation system
Solving Case studies and Program development

Total Hours	75 Hrs

Tools for Assessment (40 Marks)

Laboratory Performance- Application of Logic	Laboratory Performance- Program Creativity	Laboratory Performance- Program Debugging	Test 1	Test 2	Observation Note Book	Total
5	5	5	10	10	5	40

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	L	M	H	L	M	H	H	H	H	M	M
CO2	H	H	L	M	H	L	M	H	H	H	H	M	M
CO3	H	H	L	M	H	L	M	H	H	H	H	H	H
CO4	H	H	L	M	H	L	M	H	H	H	H	H	H
CO5	H	H	L	M	H	L	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Dr. N. KAVITHA	Dr. N. KAVITHA

Course Code	Title		
23U3DTE501	**Discipline Specific Elective Paper I: Soft Computing**		
Semester: V	**Credits: 4**	**CIA: 25 Marks**	**ESE:75 Marks**

Course Objective	To enable the students to learn the concepts of neural network theory and fuzzy logic theory
Course Category	Skill Development
Development Needs	Global
Course Description	To understand the concepts Neural Networks, Fuzzy Logic, Genetic Algorithm and Applications of Soft Computing

Course Outcomes		**Teaching Methods**	**Assessment Methods**
CO 1	Classify the Neural networks and hybrid systems.	Lecture	Group Discussion
CO 2	Build the basic models of Artificial Neural Networks.	Tutorial	Quiz
CO 3	Analyse the basic concept of fuzzy logic.	Video Lessons	Seminar
CO 4	Compare the basic technologies of Genetic Algorithm.	Flipped Classroom	Seminar
CO 5	Construct the applications of soft computing.	Video Lessons	Assignment

Offered by	**Computer Science(Data Science)**

Course Content	**Instructional Hours / Week : 6**

Unit	**Description**	**Text Book**	**Chapters**
I	**Introduction: Neural Networks**: Artificial Neural Network: Definition, Advantages of Neural Networks, Application Scope of Neural Networks, Fuzzy Logic, Genetic Algorithm. **Hybrid Systems**: Neuro Fuzzy Hybrid Systems, Neuro Genetic Hybrid Systems , Fuzzy Genetic Hybrid Systems, Soft Computing	**1**	1
		Instructional Hours	**18**
Suggested Learning Methods : Write Algorithms for Fuzzy Logic			
II	**Artificial Neural Network:** An Introduction, Fundamental Concept, Evolution of Neural Networks **Basic Models of Artificial Neural Network**: Important Terminologies of ANNs, Linear Separability, Hebb Network	1	2
		Instructional Hours	18
Suggested Learning Methods : Practice using Neural Network Terminologies			
III	**Introduction to Fuzzy Logic**: Classical Sets and Fuzzy Sets: Introduction to Fuzzy Logic, Classical Sets (Crisp Sets): Operations on Classical Sets, Properties of Classical Sets, Function Mapping of Classical Sets. **Fuzzy Sets:** Fuzzy Set Operations : Union , Intersection, Complement , More operations on Fuzzy Sets, Properties of Fuzzy Sets.	1	7
		Instructional Hours	18
Suggested Learning Methods : Group Discussion			

IV	**Genetic Algorithm: Introduction**: Biological Background, Traditional Optimization and Search Techniques, Genetic Algorithm and Search Space. **Basic Terminologies in Genetic Algorithm:** General Genetic Algorithm, Operators in Generic Algorithm, topping Condition for Generic Algorithm Flow, Problem Solving Using Genetic Algorithm.	1	15
		Instructional Hours	18
Suggested Learning Methods : Video lectures			
V	**Applications of Soft Computing:** Introduction, Optimization of Traveling Salesman Problem using Genetic Algorithm Approach, Genetic Algorithm-Based Internet Search Technique, Soft Computing Based Hybrid Fuzzy Controllers, Soft Computing Based Rocket Engine Control	1	17
		Instructional Hours	18
Suggested Learning Methods : Seminar			
		Total Hours	90 Hrs

Text Books	Wiley, **Principles of Soft Computing**, PHI/Pearson Education, 2nd edition, 2014
Reference Books	1.JangJ.S.R.,Sun C.T and Mizutami E ,**Neuro Fuzzy and Soft computing,** Prentice hall New Jersey,1998
Web. URLs	**1. http://cse.iitkgp.ac.in/~dsamanta/courses/sca/index.html** **2. https://sites.google.com/site/softcomputingcse/about-me**

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
5	5	6	3	3	3	25

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO 5
CO1	H	H	L	M	H	L	M	H	H	H	H	M	M
CO2	H	H	L	M	H	L	M	H	H	H	H	M	M
CO3	H	H	L	M	H	L	M	H	H	H	H	H	H
CO4	H	H	L	M	H	L	M	H	H	H	H	H	H
CO5	H	H	L	M	H	L	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
R. ANITHA	Dr. N. KAVITHA

Course Code	Title		
23U3DTE502	**Discipline Specific Elective Paper I: Digital Image Processing**		
Semester: V	**Credits: 4**	**CIA: 25 Marks**	**ESE:75 Marks**

Course Objective	To introduce the fundamentals and to impart knowledge on various Digital Image Processing Techniques and their Applications.
Course Category	Skill Development
Development Needs	Global/National /Local/Regional
Course Description	To understand the process of Digital image processing, Image Enhancement, Image Compression and Image Segmentation

Course Outcomes		**Teaching Methods**	**Assessment Methods**
CO 1	Learn the fundamentals of Digital Images and representing them for processing.	Lecture	Quiz
CO 2	Analyze different image enhancement techniques.	Tutorial	Group Discussion
CO 3	Restore the lost details of the image and to reconstruct.	Flipped Classroom	Seminar
CO 4	Identifying sources of redundancy and using it to compress the images.	Video Lessons	Seminar
CO 5	Comprehend the images and analyzing.	Video Lessons	Assignment

Offered by	**Computer Science(Data Science)**

Course Content	**Instructional Hours / Week : 6**

Unit	Description	Text Book	Chapters
I	**Digital image processing:** Introduction – Examples of fields that use DIP – Fundamentals steps in DIP – Components of an image processing system. **Digital Image Fundamentals**: Light and the electromagnetic spectrum – Image sensing and acquisition – Image sampling and Quantization – Basic relationship between Pixels Color Models	**1** **1**	1 **2**
	Instructional Hours		**18**
Suggested Learning Methods : Practice using Colour Models			
II	**Image Enhancement:** Intensity Transformations and Spatial Filtering: Background – Basic intensity Transformation functions – Histogram Processing- Fundamentals of spatial filtering – Smoothing spatial filters – Sharpening spatial filters **Filtering in the Frequency Domain**: Image Smoothing Using Frequency Domain Filters-Image Sharpening Using Frequency Domain Filters	1 1	3 4
	Instructional Hours		18
Suggested Learning Methods : Write Algorithms for Real time Scenario			
III	**Restoration and Reconstruction:** Model of the Image Degradation / Restoration Process – Noise models – Restoration is the process of noise only – Spatial Filtering – Periodic Noise reduction by frequency domain filtering – Estimating the degradation function – Inverse filtering – Minimum mean square Error Filtering – Constrained least squares filtering – Geometric mean filter - Image Reconstruction from Projections	1	5

		Instructional Hours	18
Suggested Learning Methods : Group Discussion			
IV	**Image Compression:** Fundamentals: Coding Redundancy - Spatial and Temporal Redundancy- Irrelevant Information - Measuring Image Information - Fidelity Criteria - Image Compression Models - Compression Methods :Huffman Coding- Golomb Coding - Arithmetic Coding -LZW Coding- Run-Length Coding- Symbol-Based Coding - Bit-Plane Coding- Digital Image Watermarking	1	8
		Instructional Hours	18
Suggested Learning Methods : Seminar			
V	**Image Segmentation**: Morphological Image Processing: Preliminaries - Erosion and Dilation **Segmentation :** Fundamentals - Point, Line, and Edge Detection: Background - Detection of Isolated Points- Line Detection- Edge Models – Thresholding-Foundation-Basic Global Thresholding- Region-Based Segmentation - Region Growing- Region Splitting and Merging– The use of motion in segmentation	1 1	9 10
		Instructional Hours	18
Suggested Learning Methods : Video Presentation			
		Total Hours	90 Hrs

Text Books	Rafael C. Gonzalez, Richard E. Woods, **Digital Image Processing**, Third Edition, PHI/Pearson Education.
Reference Books	1. B. Chanda, D. Dutta Majumder, **Digital Image Processing and Analysis**, PHI, 2003. 2. Rafael C. Gonzalez, Richard E. Woods, Steven Eddins, **Digital Image Processing using MATLAB**, Pearson Education, Inc., 2004.
Web. URLs	1.https://nptel.ac.in/courses/117105079/ **2.**https://books.google.co.in/books?id=VydaDwAAQBAJ&printsec=frontcover&dq=digital+image+processing+with+scilab&hl=en&sa=X&ved=0ahUKEwjOtfvSuuLeAhUPTo8KHQQgA5kQ6AEIKTAA

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
5	5	6	3	3	3	25

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO 5
CO1	H	H	L	M	H	L	M	H	H	H	H	M	M
CO2	H	H	L	M	H	L	M	H	H	H	H	M	M
CO3	H	H	L	M	H	L	M	H	H	H	H	H	H
CO4	H	H	L	M	H	L	M	H	H	H	H	H	H
CO5	H	H	L	M	H	L	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
M. SENTHIL KUMAR	Dr. N. KAVITHA

Course Code	Title		
23U3DTE503	Discipline Specific Elective Paper I: Data Science for Business Analytics		
Semester: V	Credits: 4	CIA: 25 Marks	ESE:75 Marks
Course Objective	To understand various types of data analytics for Business Forecasting		
Course Category	Skill Development / Employability		
Development Needs	Global/National /Local/Regional		
Course Description	Data Science for Business Analytics comprehend the process of acquiring Business Intelligence and observe the Analytics Life Cycle		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Explain the real world business problems and model with analytical solutions.	Lecture	Group Discussion
CO 2	Identify the business processes for extracting Business Intelligence	Lecture	Quiz
CO 3	Apply predictive analytics for business fore-casting	Video Lessons	Seminar
CO 4	Apply analytics for supply chain and logistics management	Tutorial / Video Lessons	Seminar
CO 5	Use analytics for marketing and sales	Video Lessons	Assignment

Offered by	Data Science

Course Content	Instructional Hours / Week :6

Unit	Description	Text Book	Chapters
I	INTRODUCTION TO BUSINESS ANALYTICS : Analytics and Data Science – Analytics Life Cycle – Types of Analytics – Business Problem Definition – Data Collection – Data Preparation – Hypothesis Generation – Modeling – Validation and Evaluation – Interpretation – Deployment and Iteration	1	2,3
	Instructional Hours		**18**
Suggested Learning Methods: Tutorial			
II	BUSINESS INTELLIGENCE: Data Warehouses and Data Mart - Knowledge Management –Types of Decisions - Decision Making Process - Decision Support Systems – Business Intelligence –OLAP – Analytic functions.	1	4,5
	Instructional Hours		**18**
Suggested Learning Methods: Group Discussion			
III	BUSINESS FORECASTING: Introduction to Business Forecasting and Predictive analytics - Logic and Data Driven Models – Data Mining and Predictive Analysis Modeling –Machine Learning for Predictive analytics.	2	2,3

		Instructional Hours	**15**
Suggested Learning Methods :Group Discussion			
IV	HR & SUPPLY CHAIN ANALYTICS: Human Resources – Planning and Recruitment – Training and Development - Supply chain network - Planning Demand, Inventory and Supply – Logistics – Analytics applications in HR & Supply Chain - Applying HR Analytics to make a prediction of the demand for hourly employees for a year	3	2,3
		Instructional Hours	**18**
Suggested Learning Methods :Video Presentation			
V	Marketing Strategy, Marketing Mix, Customer Behavior –selling Process – Sales Planning – Analytics applications in Marketing and Sales - predictive analytics for customers' behavior in marketing and sales.	3	3,4
		Instructional Hours	**18**
		Total Hours	**90 Hrs**

Text Books	1. R. Evans James, Business Analytics, 2nd Edition, Pearson, 2017 2. 2. R N Prasad, Seema Acharya, Fundamentals of Business Analytics, 2nd Edition, Wiley, 2016 3. Philip Kotler and Kevin Keller, Marketing Management, 15th edition, PHI, 2016
Reference Books	1. VSP RAO, Human Resource Management, 3rd Edition, Excel Books, 2010. 2. Mahadevan B, "Operations Management -Theory and Practice",3rd Edition, Pearson Education,2018.
Web. URLs	1. https://www.simplilearn.com/resources/data-science-business-analytics 2. https://www.mygreatlearning.com/data-science-and-business-analytics-course

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
5	5	6	3	3	3	25

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	H	L	L	H	H	M	M	H	H	H	M
CO2	H	H	H	M	H	H	M	M	H	M	H	M	M
CO3	M	M	H	H	M	M	H	M	H	H	M	H	M
CO4	M	L	L	M	M	M	H	M	H	H	M	H	M
CO5	M	H	M	H	M	M	M	H	H	H	M	M	H

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
M. SENTHIL KUMAR	Dr. N. KAVITHA

Course Code	Title		
23U3DTE504	**Discipline Specific** **Elective Paper I: Distributed System Concepts and Design**		
Semester: V	**Credits: 4**	**CIA: 25 Marks**	**ESE:75 Marks**
Course Objective	To provide basic foundation with the mechanisms of distributed computing, the inter process communication and remote communication and emerging trends in distributed computing.		
Course Category	Skill Development		
Development Needs	Global		
Course Description	To understand the process of Distributed System**,** Communication, Distributed Object, Distributed File Systems.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Elucidate the foundations and issues of distributed systems	Lecture	Group Discussion
CO 2	Understand Distributed Computing techniques, Synchronous and Processes	Tutorial	Quiz
CO 3	Analyse distributed object-oriented architecture	Flipped Classroom	Seminar
CO 4	Design a distributed system that fulfills requirements with regards to key distributed systems	Video Lessons	Seminar
CO 5	Apply Distributed web-based system.	Video Lessons	Assignment

Offered by	**Computer Science(Data Science)**

Course Content	**Instructional Hours / Week : 6**

Unit	Description	Text Book	Chapters
I	INTRODUCTION: Definition of a Distributed System - Goals - Making Resources Accessible-Distribution Transparency - Openness - Scalability – Pitfalls-Types of Distributed Systems - Distributed Computing Systems -Distributed Information Systems - Distributed Pervasive Systems- ARCHITECTURES: Architectural Styles- System Architectures - Centralized Architectures- Decentralized Architectures- Hybrid Architectures	**1**	1,2
		Instructional Hours	**18**
Suggested Learning Methods : Write Algorithms for Real time Scenario			
II	COMMUNICATION- FUNDAMENTALS- Layered Protocols- Types Of Communication - REMOTE PROCEDURE CALL - Basic RPC Operation - Parameter Passing - Asynchronous RPC- Example: DCE RPC - MESSAGE-ORIENTED COMMUNICATION- Message-Oriented Transient Communication - Message-Oriented Persistent Communication - Example: Ffim's Web sphere Message-Queuing System-STREAM-ORIENTED COMMUNICATION -Support For Continuous Media - Streams And Quality Of Service- Stream Synchronization - MULTICAST COMMUNICATION - Application-Level Multicasting - Gossip-Based Data Dissemination	1	4
		Instructional Hours	18
Suggested Learning Methods : Write Algorithms for Real time Scenario			
III	DISTRIBUTED OBJECT-BASED SYSTEMS :ARCHITECTURE-Distributed -COMMUNICATION - Binding a Client to an Object - Static versus Dynamic Remote Method Invocations - Parameter Passing -		

	Based Messaging - NAMING - CORBA Object References - Globe Object References- SYNCHRONIZATION - CONSISTENCY AND REPLICATION - Entry Consistency - Replicated Invocations-FAULT TOLERANCE- .CORBA -SECURITY .	1	10
		Instructional Hours	18
Suggested Learning Methods : Group Discussion			
IV	DISTRIBUTED FILE SYSTEMS: ARCHITECTURE - Client-Server Architectures - Cluster-Based Distributed File Systems - Symmetric Architectures 9 PROCESSES - COMMUNICATION - RPCs in NFS - The RPC Subsystem - File-Oriented Communication in Plan- NAMING - Naming in NFS- Constructing a Global Name Space - SYNCHRONIZATION - Semantics of File Sharing - File Locking -Sharing Files in Coda- CONSISTENCY AND REPLICATION - Client-Side Caching-Server-Side Replication- Replication in Peer-to-Peer File Systems - File Replication in Grid Systems-FAULT TOLERANCE - Handling Byzantine Failures-High Availability in Peer-to-Peer Systems-SECURITY- Security in NFS - Decentralized Authentication -Secure Peer-to-Peer File-Sharing Systems	1	11
		Instructional Hours	18
Suggested Learning Methods : Group Discussion			
V	DISTRIBUTED WEB-BASED SYSTEMS- ARCHITECTURE - Traditional Web-Based Systems - Web Services - PROCESSES - Clients - The Apache Web Server - Web Server Clusters – COMMUNICATION- Hypertext Transfer Protocol - Simple Object Access Protocol - NAMING SYNCHRONIZATION - CONSISTENCY AND REPLICATION -Web Proxy Caching - Replication for Web Hosting Systems - Replication of Web Applications - FAULT TOLERANCE -SECURITY	1	12
		Instructional Hours	18
Suggested Learning Methods : Video Presentation			
		Total Hours	90 Hrs

Text Books	Tanenbaum A.S., Van Steen M., **"Distributed Systems: Principles and Paradigms"**, Pearson Education, Second Edition
Reference Books	George Coulouris, Jean Dollimore and Tim Kindberg, **"Distributed Systems Concepts and Design"**, Fifth Edition, Pearson Education, 2012.
Web. URLs	**https://www.academia.edu/44063018/Epdf_pub_distributed_systems_concepts_and_design**

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
5	5	6	3	3	3	25

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO 5
CO1	H	H	M	M	M	L	M	H	H	H	H	M	M
CO2	H	H	M	M	M	L	M	H	H	H	H	M	M
CO3	H	H	M	M	M	L	M	H	H	H	H	H	H
CO4	H	H	M	M	M	L	M	H	H	H	H	H	H
CO5	H	H	M	M	M	L	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
D. J. ANITHA MERLIN	Dr. N. KAVITHA

Course Code	Title		
23U4DTZ503	Skill Based Paper III: Practical in TABLEAU		
Semester: V	Credits: 3	CIA: 30 Marks	ESE:45 Marks

Course Objective	To implement and practice various concepts in python programming
Course Category	Employability
Development Needs	Global
Course Description	Data stored in MongoDB Database is transferred to Relational Database or Hadoop so that it can transform into a format interpretable by Tableau for Data Analysis.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Creating effective visualizations	Program Demonstration	Application of Logic
CO 2	Exploring various data visualization techniques	Program Demonstration	Debugging
CO 3	Analyze data analysis techniques using Tableau	Program Demonstration	Program Creativity
CO 4	Implement various data Visualization Implementation using Tableau	Program Demonstration	Program Development
CO 5	Implement Interactive Filter using tableau	Program Demonstration	Program Development

Offered by	**Computer Science(Data Science)**
Course Content	**Instructional Hours / Week : 5**

Program List

1. Program to load and display dataset on tableau.
2. Program to implement Data Preparation using Data Interpreter on tableau
3. Program to Implement Interactive Filter using tableau
4. Develop visually appealing charts to present a data in a comprehensible format.
5. Program to plot a graph to show the Data in histogram using tableau
6. Program to show Data in Tree Map using tableau
7. Program to use a background image map using tableau
8. Connect Tableau to various data sources (databases, spreadsheets, cloud platforms, etc.) and integrate disparate datasets for analysis.

9. Create advanced charts like box plots, Gantt charts, and histograms for in-depth analysis.	
10. Prepare data for analysis within Tableau by cleaning, transforming, and reshaping datasets.	
Total Hours	**75 Hrs**
Text Books	Practical Tableau: 100 Tips, Tutorials, and Strategies from Text Book Tableau Zen Master, O'Reilly Media, 2018
Reference Book	Practical MongoDB: Architecting, Developing, and Administering MongoDB, Apress, 2015
Web References	https://www.mongodb.com/ https://www.tableau.com/

Tools for Assessment (30 Marks)

Laboratory Performance- Application of Logic	Laboratory Performance- Program Creativity	Laboratory Performance- Program Debugging	Test 1	Test 2	Observation Note Book	Total
4	4	4	7	7	4	30

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	L	M	H	L	M	H	H	H	H	M	M
CO2	H	H	L	M	H	L	M	H	H	H	H	M	M
CO3	H	H	L	M	H	L	M	H	H	H	H	H	H
CO4	H	H	L	M	H	L	M	H	H	H	H	H	H
CO5	H	H	L	M	H	L	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
D. J. ANITHA MERLIN	Dr. N. KAVITHA

Course Code	Title		
23U3DTC612	Core Paper XVI: Big Data Analytics		
Semester: VI	Credits: 3	CIA: 20 Marks	ESE: 55 Marks

Course Objective	To provide an overview of an exciting growing field of big data analytics, analyse big data like Hadoop, NoSQL Map-Reduce and learn fundamental techniques and principles in achieving big data analytics
Course Category	Skill Development
Development Needs	Global
Course Description	Develop the Skills to handle the massive Data is storing in huge sets of knowledge properly using Hadoop.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Know about the big data analytics	Lecture	Assignment
CO 2	Tools in big data analytics using Hadoop	Tutorial	Seminar
CO 3	Data model in big data analytics using NoSql	Lecture	Quiz
CO 4	Understanding and Know about Map Reduce Programming	Tutorial	Seminar
CO 5	Gain more knowledge about Hadoop streaming with R	Lecture	Quiz

Offered by	**Computer Science(Data Science)**

Course Content	Instructional Hours / Week : 5

Unit	Description	Text Book	Chapters
I	**INTRODUCTION TO BIG**: Introduction to Big Data, Big Data characteristics, types of Big Data, Traditional vs. Big Data business approach, Bigdata Challenges, Case Study of Big Data Solutions.	1	1
		Instructional Hours	**15**
Suggested Learning Methods : **Video lectures about the basics of Big Data Analytics**			
II	**HADOOP:** Introducing Hadoop – Why Hadoop – Why not RDBMS – RDBMS versus Hadoop – History of Hadoop – Hadoop Overview – Hadoop Distributed File System (HDFS) – Processing Data with Hadoop – Managing Resources and Applications with Hadoop YARN – Interacting with Hadoop Ecosystem.	2	2
		Instructional Hours	**15**
Suggested Learning Methods : Video Lecture			
III	**NoSQL DATA MODEL:** Introduction to NoSQL – NoSQL Business Drivers – NoSQL Data Architectural Patterns – Variations of NoSQL Architectural Patterns – Using NoSQL to Manage Big data – Case study of NoSQL	1	3
		Instructional Hours	**15**
Suggested Learning Methods : Lab Practical			

IV	**MAP REDUCE Programming:** Introduction to MapReduce – Mapper – Reducer – Combiner – Partitioner – Searching – Sorting – Compression	2	4
		Instructional Hours	**15**
Suggested Learning Methods : Assignment			
V	**Hadoop streaming with R:** Understanding the basics of Hadoop streaming – How to run Hadoop streaming with R – Understanding a MapReduce application – Understanding how to code and run a Map-Reduce application – how to explore the output of Map Reduce application.	3	4
		Instructional Hours	**15**
Suggested Learning Methods : Laboratory practice			
		Total Hours	**75** Hrs

Text Books	1. Radha Shankarmani, M Vijayalakshmi, "Big Data Analytics",WileyPublications,first Edition 2016 2. Seema Acharya, Subhashini Chellappan**,** "Big Data and Analytics", Wiley Publication, first edition. Reprint in 2016 3. Vignesh Prajapati, Data analytics with R and Hadoop , Copyright © 2013, Packt Publishing.
Reference Books	1. Michael Minelli, Michelle Chambers, and AmbigaDhiraj, Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Businesses, Wiley, 2013. 2. Bill Franks, Taming,The Big Data Tidal Wave: Finding Opportunities In Huge Data Streams With Advanced Analytics, Wiley.

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Class Participation	Total
4	4	5	3	2	3	20

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO 5
CO1	H	H	L	M	H	L	M	H	H	H	H	M	M
CO2	H	H	L	M	H	L	M	H	H	H	H	M	M
CO3	H	H	L	M	H	L	M	H	H	H	H	H	H
CO4	H	H	L	M	H	L	M	H	H	H	H	H	H
CO5	H	H	L	M	H	L	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by Charman
R. ANITHA	Dr. N. KAVITHA

Course Code	Title		
23U3CJC608	Core Paper XVII: Deep Learning		
Semester: VI	Credits: 3	CIA: 20 Marks	ESE: 55 Marks
(Common to B. Sc (CS(DS) / AIML)			
Course Objective	To introduce the basic concepts and techniques of deep Learning.		
Course Category	Employability		
Development Needs	Global		
Course Description	This course aims to present the core fundamentals behind the much talked about field of Deep Learning.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the basic concepts and techniques ofDeep Learning.	Lecture	Assignment
CO 2	Implementing Neural Networks in Tensor Flow	Demonstration	Seminar
CO 3	Understand and apply Convolution NeuralNetworks.	Lecture	Quiz
CO 4	Analyze the Memory Augmented Neural Networksand Differentiable Neural Computers	Tutorial	Program Execution
CO 5	Explore Deep Reinforcement Learning.	Lecture	Program Execution

Offered by	Artificial Intelligence and Machine Learning

Course Content	Instructional Hours / Week : 4

Unit	Description	Text Book	Chapters
I	**Neural Network.:** Building Intelligent Machines-The Limits of Traditional-Computer Programs- The Mechanics of Machine Learning- The Neuro Expressing Linear Perceptrons as Neurons- Feed-Forward Neural Networks- Linear Neurons and Their Limitations- Sigmoid, Tanh, and ReLU Neurons-Softmax Output Layers. **Training Feed-Forward Neural Networks:** The Fast-Food Problem-Gradient Descent-The Delta Rule and Learning Rates-Gradient Descent with Sigmoidal Neurons-The Back propagation Algorithm-Stochastic and Minibatch Gradient Descent-Test Sets, Validation Sets, and Overfitting-Preventing Over fitting in Deep Neural Networks.	1	1,2
	Instructional Hours		**12**
	Suggested Learning Methods: Video lectures		
II	**Implementing Neural Networks in Tensor Flow**: What Is Tensor Flow?-How Does Tensor Flow Compare to Alternatives?- Installing Tensor Flow-Creating and Manipulating Tensor Flow Variables-Tensor Flow Operations - Placeholder Tensors-Sessions in Tensor Flow-Navigating Variable Scopes and Sharing Variables - Managing Models over the CPU and GPU-Specifying the Logistic	1	3

	Regression Model in Tensor Flow- Logging and Training the Logistic Regression Model-Leveraging Tensor Board to Visualize Computation Graphs and Learning-Building a Multilayer Model for MNIST in Tensor Flow		
		Instructional Hours	**12**
		Suggested Learning Methods: Video lectures	
III	**Convolutional Neural Networks:** Neurons in Human Vision-The Shortcomings of Feature Selection-Vanilla Deep Neural Networks Don't Scale-Filters and Feature Maps-Full Description of the Convolutional Layer-Max Pooling-Full Architectural Description of Convolution Networks-Closing the Loop on MNIST with Convolutional Networks-Image Preprocessing Pipelines Enable More Robust Models-Accelerating Training with Batch Normalization-Building a Convolutional Network for CIFAR-10-Visualizing Learning in Convolutional Networks-Leveraging Convolutional Filters to Replicate Artistic Styles-Learning Convolutional Filters for Other Problem Domains	1	5
		Instructional Hours	**12**
		Suggested Learning Methods: Video lectures	
IV	**Memory Augmented Neural Networks: N**eural Turing Machines-Attention-Based Memory Access-NTM Memory Addressing Mechanisms-Differentiable Neural Computers-Interference-Free Writing in DNCs-DNC Memory Reuse-Temporal Linking of DNC Writes-Understanding the DNC Read Head-The DNC Controller Network-Visualizing the DNC in Action-Implementing the DNC in Tensor Flow-Teaching a DNC to Read and Comprehend	1	8
		Instructional Hours	**12**
		Suggested Learning Methods: Video lectures	
V	**Deep Reinforcement Learning:** Deep Reinforcement Learning Masters Atari Games-What Is Reinforcement Learning?-Markov Decision Processes (MDP)- Explore Versus Exploit-Policy Versus Value Learning- Pole-Cart with Policy Gradients- Q-Learning and DeepQ-Networks- Improving and Moving Beyond DQN	1	9
		Instructional Hours	**12**
		Suggested Learning Methods: Video lectures	
		Total Hours	**60**

Text Books	1. Nikhil Buduma, Nicholas Locascio, **"Fundamentals of Deep Learning: Designing Next-Generation Machine Intelligence Algorithms**",O'Reilly Media, 2017. **Unit I :** Text Book 1, Chapters 1,2 **Unit II:** Text Book 1, Chapter 3 **Unit III:** Text Book 1, Chapter 5 **Unit IV:** Text Book 1, Chapter 8 **Unit V:** Text Book 1, Chapter 9
Reference Books	1. Keras Navin Kumar Manaswi , **"Deep Learning with Applications Using Python: Chatbots and Face, Object, and Speech Recognition with Tensor flow and Keras",** Apress, 2018 2. Ian Good fellow, Yoshua Bengio, Aaron Courville, **"Deep Learning (Adaptive computation and Machine Learning series**", MIT Press, 2017.

Web. URLs	https://www.javatpoint.com/deep-learning

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
4	4	5	2	2	3	20

Mapping

CO / PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	L	M	L	M	L	H	L	H	M	M	H	M	M
CO2	M	M	L	L	M	M	M	H	L	H	L	M	H
CO3	M	H	M	L	M	M	M	M	L	M	H	H	M
CO4	H	M	M	L	L	M	M	M	H	H	M	H	M
CO5	H	M	M	L	L	L	M	H	H	M	H	M	M

H-High; M-Medium; L-Low

Course designed by	Verified By Chairman
Mr. M. Vijayakumar	Dr .K. Selvavinayaki

Course Code	Title		
23U3DTE605	**Discipline Specific Elective Paper II: Computer Networks**		
Semester: VI	**Credits: 4**	**CIA: 25 Marks**	**ESE: 75 Marks**

Course Objective	To inculcate knowledge on Networking concepts and technologies like wireless, Broadband and Bluetooth**.**
Course Category	Skill Development
Development Needs	Global
Course Description	Develop Problem Solving Skills to solve the computer based problems at Global needs.

Course Outcomes		**Teaching Methods**	**Assessment Methods**
CO 1	Understand about network hardware, software and uses of computer networks	Lecture	Assignment
CO 2	Understand Guided Transmission Media, Wireless Transmission, and Communication Satellites	Flipped Classrooms	Seminar
CO 3	Understand error detection and correction, elementary data link protocol and Routing algorithms	Lectures	Quiz
CO 4	Understand and identify the applications of application layer and network security	Tutorial	Seminar
CO 5	Apply Networking technologies in the real-time system.	Video Lecture	Quiz

Offered by	**Computer Science(Data Science)**

Course Content	**Instructional Hours / Week : 6**

Unit	**Description**	**Text Book**	**Chapters**
I	**Uses of computer networks**: Business Applications- Home Applications - Mobile Users - and Social Issues. **Network Hardware**: Personal Area Networks - Local Area Networks - Metropolitan Area Networks - Wide Area Networks, Internetworks. **Network software**: Protocol Hierarchies - Design Issues for the Layers - Connection-Oriented Versus Connectionless Service - Service Primitives - the Relationship of Services to Protocols - **Reference models**: The OSI Reference Model - The TCP/IP Reference Model- A Comparison of the OSI and TCP/IP Reference Models.	1	1
	Instructional Hours		18
Suggested Learning Methods : Video lectures			
II	**Physical Layer - Guided Transmission Media**: Magnetic Media – Twisted Pair – Coaxial Cable – Fiber Optics. **Wireless Transmission**: Electromagnetic Spectrum –Radio Transmission – Microwave Transmission – Infrared and Millimeter Waves – Light Waves. **Communication Satellites**: Geostationary - Medium-Earth Orbit - Low Earth-orbit Satellites – Satellites versus Fiber.	1	2
	Instructional Hours		18

Suggested Learning Methods : Quiz			
III	**Deep learning for text and sequences:** Working with text data **Data link Layer:** Services Provided to the Network Layer – Framing- Error Control - Flow Control. **Error detection and Correction:** Error-Correcting Codes - Error-Detecting Codes. **Elementary data link Protocols**: A Utopian Simplex Protocol- A Simplex Stop-and-Wait Protocol for an Error-Free Channel- A Simplex Stop-and-Wait Protocol for a Noisy Channel. **Sliding Window Protocols:** One-Bit sliding window protocol – A protocol using Go-Back-N – A Protocol using Selective Repeat.	1	3
		Instructional Hours	18
Suggested Learning Methods : Role Play			
IV	**Network layer: Routing algorithm**-The Optimality Principle, Shortest Path Algorithm, Flooding, Distance Vector Routing, Link State Routing, Hierarchical Routing, Broadcast Routing, Multicast Routing,Anycast Routing, Routing for Mobile Hosts, Routing in Ad Hoc Networks, **Transport layer: Elements of transport protocols**-Addressing, Connection Establishment, Connection Release, Error Control and Flow Control, Multiplexing, Crash Recovery **The Internet** **Transport Protocols UDP**: Introduction to UDP. TCP- Introduction to TCP, The TCP Service Model, The TCP Protocol, The TCP Segment Header, TCP Connection Establishment,TCP Connection Release, TCP Connection Management Modeling, TCP Sliding Window,TCP Timer Management, TCP Congestion Control.	1	5,6
		Instructional Hours	18
Suggested Learning Methods : Flipped Class			
V	**Application layer:** DNS—The Domain Name System, The DNS Name Space, Domain Resource Records, Name Servers, **Electronic mail**-Architecture and Services, The User Agent, Message Formats, Message Transfer, Final Delivery, **Network Security:** Cryptography-Introduction to Cryptography, Substitution Ciphers, Transposition Ciphers, One-Time Pads, Two Fundamental Cryptographic Principles.	1	7,8
		Instructional Hours	18
Suggested Learning Methods : Laboratory practice			
		Total Hours	**90** Hrs

Text Books	1. Andrew S. Tanenbaum; Computer Networks, 4th edition, PHI
Reference Books	1. Achyut Godbole, Data Communication and Networks, 2007, TMH. 2. Uyless Black, Computer Networks: Protocols, Standards, and Interfaces, 2nd ed., PHI
Tools for Assessment (25 Marks)	

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
5	5	6	3	3	3	25

Mapping

CO \ PO	PO1	PO 2	PO 3	PO 4	PO 5	PO 6	PO7	PO 8	PSO 1	PSO 2	PSO 3	PSO 4	PSO5
CO1	H	H	L	M	H	L	M	H	H	H	H	M	M
CO2	H	H	L	M	H	L	M	H	H	H	H	M	M
CO3	H	H	L	M	H	L	M	H	H	H	H	H	H
CO4	H	H	L	M	H	L	M	H	H	H	H	H	H
CO5	H	H	L	M	H	L	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
R. ANITHA	Dr. N. KAVITHA

Course Code	Title		
23U3DTE606	Discipline Specific Elective Paper II: Web Media Analytics		
Semester: VI	Credits:4	CIA:25 Marks	ESE:75 Marks
Course Objective	To understand how big data principles implemented in social media & Web		
Course Category	Skill Development		
Development Needs	Global		
Course Description	To understand the types, Features, Functions, Process Management of Social and Web Media Analytics		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	To recognize the fundamental concepts of Web media.	Lecture	Group Discussion
CO 2	To recognize the fundamental concepts of Web.	Tutorial	Quiz
CO 3	To analyze data obtained from social media.	Flipped Classroom	Seminar
CO 4	To explain the experimental methods in web data analytics.	Video Lessons	Seminar
CO 5	To recognize the types of data for social media & Web analytics.	Case Study	Assignment

Offered by	Computer Science(Data Science)

Course Content	Instructional Hours / Week : 6

Unit	Description	Text Book	Chapters
I	**Introduction:** History of Social media- Basics of Social Media and Business Models- Basics of Web Search Engines and Digital Advertising. Web& social media (websites, web apps , mobile apps & social media)	1	
		Instructional Hours	**18**
Suggested Learning Methods : Quiz			
II	**Web analytics:** Web analytics 2.0 framework (clickstream, multiple outcomes analysis, experimentation and testing, voice of customer, competitive intelligence, Insights) - Experimental methods in web data analytics - Air France Internet Marketing Case Study - Econometric modeling of search engine ads	1	
		Instructional Hours	**18**
Suggested Learning Methods : Video Presentation			
III	**Structured data Vs unstructured data**: Data (Structured data, unstructured data, metadata, Big Data and Linked Data) -Lab testing and experiment design (selecting participants, within-subjects or between subjects study, counterbalancing, independent and dependent variable; A/B testing, multivariate testing, controlled experiments	2	
		Instructional Hours	**18**
Suggested Learning Methods : Group Discussion			

IV	**Web metrics and web analytic**: Web metrics and web analytics - PULSE metrics (Page views, Uptime, Latency, Seven-day active users) on business and technical issues; -HEART metrics (Happiness, Engagement, Adoption, Retention, and Task success) on user behaviour issues; -On-site web analytics, off-site web analytics, the goal-signal-metric process	1	
		Instructional Hours	**18**
Suggested Learning Methods : Group Discussion			
V	**Social media analytics:** Social media analytics - Social media analytics (what and why) - Social media KPIs (reach and engagement) - Performing social media analytics (business goal, KPIs, data gathering, analysis, measure and feedback) 6. Data analysis language and tools Cases and examples - User experience measurement cases - Web analytics cases 8. Group work and hands on practice - Usability study planning and testing; and data analysis using software tools (Google Analytics, Google Sites, R and Deducer)	2	
		Instructional Hours	**18**
Suggested Learning Methods : Video Presentation			
		Total Hours	90 Hrs

Text Books	1. 1. Brian Clifton, Advanced Web Metrics with Google Analytics, John Wiley & Sons;edition (30 Mar 2012) 2. Jim Sterne, Social Media Metrics: How to Measure and Optimize Your Marketing.Investment, John Wiley & Sons (16 April 2010) Presenting Usability Metrics, Morgan Kaufmann; 1 edition (28 April 2008).
Reference Books	1. Avinash Kaushik, Web Analytics 2.0: The Art of Online Accountability and Science of Customer Centricity, John Wiley & Sons. 2. Tom Tullis, Bill Albert, Measuring the User Experience: Collecting, Analyzing, and Presenting Usability Metrics, Morgan Kaufmann; 1 edition (28 April 2008). 3. Avinash Kaushik, Web Analytics: An Hour a Day, John Wiley & Sons, 2007

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
5	5	6	3	3	3	25

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO 5
CO1	H	H	L	M	H	L	M	H	H	H	H	M	M
CO2	H	H	L	M	H	L	M	H	H	H	H	M	M
CO3	H	H	L	M	H	L	M	H	H	H	H	H	H
CO4	H	H	L	M	H	L	M	H	H	H	H	H	H
CO5	H	H	L	M	H	L	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Dr. B. NARASIMHAN	Dr. N. KAVITHA

Course Code	Title		
23U3DTE607	Discipline Specific Elective Paper II: Cloud Analytics		
Semester: VI	Credits: 4	CIA: 25 Marks	ESE: 75 Marks
Course Objective	To Process and Analyze big data using a Cloud Platform		
Course Category	Employability		
Development Needs	Global		
Course Description	Understand the Concept of Compute and Storage and Databases and Processing and Visualization		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the basics of Cloud computing services	Lecture	Assignment
CO 2	Understand the Concept of Compute and Storage and Databases	Tutorial	Seminar
CO 3	ApplyCloud Pub /Sub – Cloud Storage	Lectures	Quiz
CO 4	Understand the Concept of Processing and Visualization	Tutorial	Program Execution
CO 5	CreateCloud Translation API	Lecture	Program Execution

Offered by	Computer Science

Course Content	Instructional Hours / Week : 6

Unit	Description	Text Book	Chapters
I	**Introduction to cloud Analytics –** Cloud Computing deployment models – Types of Cloud computing services – Paas, Iaas, - Emerging cloud technologies and services- Design and Business Consideration – Architecture of a cloud computing ecosystem.	1	1,2
		Instructional Hours	**18**
Suggested Learning Methods:Video lectures about Python Programming			
II	**High Level Understanding of GCP –** Understanding Cloud categories – Compute – Storage and Databases – Networking – Big data – Data transfer – Cloud AI – Internet of Thinks – Management Tools – Developer Tools.	1	3
		Instructional Hours	18
Suggested Learning Methods: Practice using Flow Charts			
III	**Ingestion and Storing –** Bring the Data and Capture it cloud Dataflow – Cloud Pub /Sub – Cloud Storage – Cloud SQL – Cloud Big Table – Cloud Spanner – Cloud Datastore – Persistent Disks	1	4
		Instructional Hours	18
Suggested Learning Methods : Develop small programmes using tuples			
IV	**Processing and Visualization –** Closer Encounter Google Big query - Cloud Dataproc – Google Cloud Datalab – Google Data Studio – Google Computer Engine – Google App Engine – Google Container Engine –Google Cloud Engine.	1	5
		Instructional Hours	18
Suggested Learning Methods : Apply the programs in the Python Software			

V	**Machine Learning , Deep Learning , And AI on GCP , AI, Machine learning –** Cloud Natural Language API – Tenser Flow – Cloud Speech API – Cloud Translation API – Cloud Vision API – Cloud Video Intelligence – Guidance on google Cloud Platform Certification – Professional Cloud Architect Certification.	1 3	16 1
		Instructional Hours	18
Suggested Learning Methods : Laboratory practice			
		Total Hours	90 Hrs
Text Books	1. Sanket Thodge, Cloud Analytics with google Cloud Platform, Packt Publishing Ltd , April 2018.		
Reference Books	2. Abassin Sidiq, SAP Analytics Cloud , Rheinwerk Publishing, 2020		
Web. URLs	1. Cloud Analytics with Google Cloud Platform - Google Books		

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
5	5	6	3	3	3	25

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	L	M	M	L	M	M	H	H	M	M
CO2	M	M	M	M	H	M	M	M	H	H	H	M	H
CO3	H	L	M	H	M	M	L	H	M	H	H	M	M
CO4	M	H	L	M	L	L	H	M	H	M	H	H	M
CO5	M	M	H	H	M	H	M	H	H	H	M	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
R. ANITHA	Dr. N. KAVITHA

Course Code	Title		
23U3DTE608	Discipline Specific Elective Paper II: Fundamentals of IoT Analyticsc		
Semester: VI	Credits: 4	CIA: 25	ESE: 75
Course Objective	To understand how IoT emphasizes the interconnection of virtually all types of physical objects towards enabling them to exchange data and services among themselves,		
Course Category	Skill Development		
Development Needs	Global		
Course Description	To understand IoT data analysis integral element of non-trivial IoT system.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand and comprehend the intricacies of IoT Analytics.	Lecture	Group Discussion
CO 2	Understand the foundation of Data Analytics for the IoT.	Lecture	Quiz
CO 3	Understand search architecture for both Social and Physical Sensors.	Video Lessons	Seminar
CO 4	Learn to design, implement, and optimize robust IoT analytics .	Tutorial	Seminar
CO 5	Understand emerging challenges and advancements in Edge-based Solutions .	Video Lessons	Assignment

Offered by	Computer science(Data Science)

Course Content	Instructional Hours / Week :6

Unit	Description	Text Book	Chapters
I	Introducing IoT Analytics: IoT Data and BigData - Challenges of IoT Analytics Applications - IoT Analytics Lifecycle and Techniques - Cloud-based IoT Platform - IaaS, PaaS and SaaS Paradigms - Requirements of IoT BigData Analytics Platform - Functional Architecture	1	1,2
	Instructional Hours		
Suggested Learning Methods: Tutorial			
II	Data Analytics for the IoT - Data Collection Using Low-power, Long-range Radios - WAZIUP Software Platform - Main Challenges - PaaS for IoT - Architecture - Deployment - iKaaS Software Platform - Service Orchestration and Resources Provisioning	1	2
	Instructional Hours		**18**
Suggested Learning Methods: Group Discussion			
III	Searching the Internet of Things - A Search Architecture for Social and PhysicalSensors - Search engine for MultimediAenviRonment generated contenT (SMART) -	1	3

	Challenges in Building an IoT Search Engine - Local Event Retrieval - Social Sensors for Local Event Retrieval		
		Instructional Hours	**18**
Suggested Learning Methods : Group Discussion			
IV	Development Tools for IoT Analytics Applications - The VITALArchitecture for IoT Analytics Applications - VITAL Development Environment - VITAL Nodes - PPI nodes - System nodes - Services nodes - Sensors nodes - Observations nodes - DMS nodes - Query systems - Query services - Query sensors.	1	4
		Instructional Hours	**18**
Suggested Learning Methods :Video Presentation			
V	Internet-of-Things Analytics for Smart Cities - State of the Art - Cloud-based City Platform - Use Case of Cloud-based Data Analytics - New Challenges towards Edge-based Solutions - Edge-based IoT Analytics - State of the Art - Edge-based City Platform - Workflow	1	8
		Instructional Hours	**18**
		Total Hours	**90**

Text Books	John Soldatos, “Building Blocks for IoT Analytics”, River Publishers, 2017.
Reference Books	Andrew Minteer, “Analytics for the Internet of Things (IoT)”, Packt Publishing, 2017.
Web. URLs	https://docs.aws.amazon.com/iotanalytics/latest/userguide/getting-started.html

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
5	5	6	3	3	3	25

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	M	H	M	M	M	L	M	M	H	L	M	M
CO2	M	M	H	L	M	M	M	M	H	L	M	M	M
CO3	M	M	M	L	M	M	H	L	M	M	M	M	L
CO4	M	H	H	M	M	H	H	H	L	M	M	H	H
CO5	H	H	M	M	H	H	H	H	H	L	M	H	M

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Dr. B. NARASIMHAN	Dr. N. KAVITHA

Course Code	Title		
23U3DTE609	**Discipline Specific Elective Paper III: Software Engineering**		
Semester: VI	**Credits: 4**	**CIA: 25 Marks**	**ESE: 75 Marks**
Course Objective	To gain knowledge about basic concepts of Software Engineering and Testing		
Course Category	Skill Development		
Development Needs	Global		
Course Description	To understand the concepts of Software Engineering and Testing and Develop applications		

Course Outcomes		**Teaching Methods**	**Assessment Methods**
CO 1	Able to understand the nature of the software and different types of process models	Lecture	Class Participation
CO 2	Gains knowledge about the requirements stage development of the software	Tutorial	Quiz
CO 3	Analyse the different types of architectural designs of the software	Flipped Classroom	Seminar
CO 4	Setting the context on Software Development and Evaluates different testing strategies of the software	Video Lessons	Seminar
CO 5	Understand the testing types and test automation	Video Lessons	Assignment

Offered by	**Computer Science(Data Science)**
Course Content	**Instructional Hours / Week : 6**

Unit	Description	Text Book	Chapters
I	**Introduction to Software Engineering:** Evolving role of software- Software- The changing nature of Software- Software Myths. A Generic view of Process- A Layered Technology **Software Process Models:** Prescriptive models- The Waterfall Model - Incremental Process Models- Evolutionary Process Models.	1	1,3
		Instructional Hours	18
Suggested Learning Methods: Quiz			
II	**Requirements Engineering:** Requirements Engineering Tasks- Initiating the Requirements Engineering Process- Eliciting Requirements- Building the Analysis Model. **Building the Analysis Model:** Scenario-Based Modelling- Flow Oriented Modelling.	1	6,7
		Instructional Hours	18
Suggested Learning Methods: Flipped Class			
III	**Design Engineering:** Design Concepts -The design model. **Creating an Architectural Design:** Representing the System in Context- Defining Archetypes- Refining the Architecture into	1	9,10,11 & 12

	Components- Describing Instantiations of the System **Modelling Component-Level Design:** What is a Component – Designing Class-Based Components.**User Interface Design:** User Interface Analysis and Design-Interface Design steps.		
		Instructional Hours	18
Suggested Learning Methods : Role Play			
IV	**Software Development Life Cycle models:** Phases of Software project – Quality, Quality Assurance, Quality control – Testing, Verification and Validation **White-Box Testing-** Static Testing – Structural Testing **Black-Box Testing-** How to do Black-Box Testing?	2	2,3,4
		Instructional Hours	18
Suggested Learning Methods : GLM			
V	**Integration Testing**: Integration Testing as Type of Testing – Integration Testing as a Phase f Testing – Scenario Testing – Defect Bash. **System and Acceptance Testing**: system Testing Overview – Why System testing is done? – Functional versus Non-functional Testing - Functional testing - Non-functional Testing – Acceptance Testing. **Performance Testing**: Methodology of Performance Testing – tools for Performance Testing. **Regression Testing**: What is Regression Testing? – Types of Regression Testing, What is Test Automation?	2	5,6,7, 8,16
		Instructional Hours	18
Suggested Learning Methods : Simple Application Development			
		Total Hours	90 Hrs

Text Books	3. Roger S Pressman, **Software Engineering a Practitioner's Approach**, Sixth Edition, McGraw Hill, International Edition, 2013 4. Srinivasan Desikan, Gopalaswamy Ramesh, **Software Testing Principles and Practices**, Pearson, 2006.
Reference Books	1. Richard Fairley, **Software Engineering Concepts**, Tata McGraw-Hill Publishing Company Limited, 2010. **2.** Waman S. Jawadekar, **Software Engineering – Principles and Practice**, Tata McGraw Hill Publishing Company Limited, 2011.
Web. URLs	https://www.javatpoint.com/software-engineering https://www.tutorialspoint.com/software_engineering/index.htm

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
5	5	6	3	3	3	25

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	L	M	H	L	M	H	H	H	H	M	M
CO2	H	H	L	M	H	L	M	H	H	H	H	M	M
CO3	H	H	L	M	H	L	M	H	H	H	H	H	H
CO4	H	H	L	M	H	L	M	H	H	H	H	H	H
CO5	H	H	L	M	H	L	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
M. SENTHIL KUMAR	Dr. N. KAVITHA

Course Code	Title		
23U3DTE610	Discipline Specific Elective Paper III: Data Science for Marketing		
Semester: VI	Credits: 4	CIA: 25 Marks	ESE:75 Marks
Course Objective	To understand skills to analyse and interpret data, gain deeper customer insights, make data-driven decisions, and implement effective marketing strategies.		
Course Category	Employability		
Development Needs	Global		
Course Description	Data Science in Marketing course focuses on the application of Data Science in the marketing domain.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Data science methods to marketing and customer analytics using real-world, as well as synthetic datasets.	Lecture	Group Discussion
CO 2	Actionable data-driven approaches to support profit-maximization marketing decisions	Lecture	Quiz
CO 3	To assess the incremental role of each marketing mix component	Video Lessons	Seminar
CO 4	Evaluate the incremental role of each touch point in providing various marketing outcomes	Tutorial	Seminar
CO 5	To build predictive models of various business outcomes using supervised learning methods	Video Lessons	Assignment

Offered by	Computer Science(Data Science)
Course Content	Instructional Hours / Week :6

Unit	Description	Text Book	Chapters
I	Introduction and Environment Setup-Data Science and Marketing :Technical requirements - Trends in marketing - Applications of data science in marketing: Descriptive versus explanatory versus predictive analyses -Types of learning algorithms - Data science workflow - Setting up the Python environment : Installing the Anaconda distribution - A simple logistic regression model in Python -Setting up the R environment : Installing R and RStudio -A simple logistic regression model in R.	1	1,2
		Instructional Hours	18
Suggested Learning Methods: Tutorial			
II	Key Performance Indicators and Visualizations : KPIs to measure performances of different marketing efforts -Sales revenue-Cost per acquisition (CPA)-Digital marketing KPIs-Computing and visualizing KPIs using Python: Aggregate conversion rate-Conversion rates by age-Conversions versus non-conversions-Conversions by age and marital status.	1	2
		Instructional Hours	18

Suggested Learning Methods: Group Discussion			
III	Drivers behind Marketing Engagement :Using regression analysis for explanatory analysis -Explanatory analysis and regression analysis -Logistic regression - Regression analysis with Python: Data analysis and visualizations -Engagement rate -Sales channels -Total claim amounts - Regression analysis : Continuous variables - Categorical variables - Combining continuous and categorical variables	1	3
		Instructional Hours	**18**
Suggested Learning Methods :Group Discussion			
IV	From Engagement to Conversion: Decision trees-Logistic regression versus decision trees-Growing decision trees-Decision trees and interpretations with Python: Data analysis and visualization- Conversion rate-Conversion rates by job-Default rates by conversions-Bank balances by conversions-Conversion rates by number of contacts.	1	4
		Instructional Hours	**18**
Suggested Learning Methods :Video Presentation			
V	Product Analytics: The importance of product analytics-Product analytics using Python: Time series trends -Repeat customers - Trending items over time- Product analytics using R: Time series trends -Repeat customers - Trending items over time.	1	5
		Instructional Hours	**18**
		Total Hours	**90Hrs**

Text Books	1. Yoon Hyup Hwang , Hands-On Data Science for Marketing, 2nd Edition, 2019 2. Tommy Blanchard, Data Science for Marketing Analytics 1st Edition, Kindle,2019
Reference Books	1. Hyup Hwang, Improve your marketing strategies with machine learning using Python and R, 1st Edition, Packt Publishing, 2019.
Web. URLs	1. https://www.analyticsvidhya.com/blog/2023/06/data-science-for-marketing/ 2. https://www.datacamp.com/blog/5-ways-use-data-science-marketing

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
5	5	6	3	3	3	25

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	H	L	L	H	H	M	M	H	H	H	M
CO2	H	H	H	M	H	H	M	M	H	M	H	M	M
CO3	M	M	H	H	M	M	H	M	H	H	M	H	M
CO4	M	L	L	M	M	M	H	M	H	H	M	H	M
CO5	M	H	M	H	M	M	M	H	H	H	M	M	H

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Dr. K. SUMATHI	Dr. N. KAVITHA

Course Code	Title		
23U3DTE611	Discipline Specific Elective Paper III: Bio – Inspired Computing for Data Science		
Semester: VI	Credits: 4	CIA: 25	ESE: 75
Course Objective	Explore bio-inspired computing techniques, applying them to data science for innovative problem-solving and data-driven insights.		
Course Category	Skill Development		
Development Needs	Global		
Course Description	This course delves into the realm of bio-inspired computing, where nature's mechanisms inspire innovative solutions in data science. Students will explore algorithms and approaches inspired by biological systems to tackle complex data-driven challenges, fostering a deep understanding of their application in problem-solving and data analysis.		

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand evolutionary algorithms, fitness functions, population dynamics, selection, variation operators, initialization, and termination conditions for optimization problems.	Lecture	Group Discussion
CO 2	Comprehend rewriting systems, evolutionary developmental programs, and artificial immune systems, with applications in algorithms and shape space exploration.	Lecture	Quiz
CO 3	Explore cognitive science, AI behavior, behavior-based robotics, and biological inspiration, analyzing robot learning, co-evolution, self-reproduction, and simulation.	Video Lessons	Seminar
CO 4	Grasp local search concepts, memetic algorithms, intelligent initialization, hybridization strategies, and genotype phenotype mapping in optimization problems.	Tutorial	Seminar
CO 5	Understand self-organization, PSO, ACO, swarm robotics, co-evolution, and cooperation in artificial systems and optimization.	Video Lessons	Assignment

Offered by	Computer Science(Data Science)

Course Content	Instructional Hours / Week : 6

Unit	Description	Text Book	Chapters
I	Nature - inspired computation and swarm intelligence: Introduction - Optimization and optimization algorithms - Nature inspired algorithms for optimization - Algorithms and self organization - open problems	1	1
		Instructional Hours	18
Suggested Learning Methods: Tutorial			

II	Bat algorithm and Cuckoo search algorithm: Introduction - Bat algorithm - Cuckoo search algorithm - Discretization and solution representation.	1	2
		Instructional Hours	**18**
Suggested Learning Methods: Group Discussion			
III	Firefly algorithm and Flower pollination algorithm: Introduction - Firefly algorithm - Flower pollination algorithm	1	3
		Instructional Hours	**18**
Suggested Learning Methods :Group Discussion			
IV	Bio - inspired algorithms: principles, implementation, and applications to wireless communication: Introduction - Selected bio-isnpired techniques - principles and implementation - Application of bio-inspired optimization techniques in wireless communication	1	4
		Instructional Hours	**18**
Suggested Learning Methods :Video Presentation			
V	Clustering with nature-inspired metaheuristics: Introduction - Clustering with metaheuristics - Use cases.	1	10
		Instructional Hours	**18**
		Total Hours	**90 Hrs**

Text Books	Xin-She Yang, "Nature Inspired Computation and Swarm Intelligence", Elsevier Academic Press, 2020.
Reference Books	R. C. Ebelhart, “Swarm Intelligence”, Morgan Kaufmann, 2001.
Web. URLs	https://tutorials.one/bio-inspired-computing-approach-in-artificial-intelligence/

Tools for Assessment (25 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
5	5	6	3	3	3	25

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	M	H	M	M	M	L	M	M	H	L	M	M
CO2	M	M	H	L	M	M	M	M	H	L	M	M	M
CO3	M	M	M	L	M	M	H	L	M	M	M	M	L
CO4	M	H	H	M	M	H	H	H	L	M	M	H	H
CO5	H	H	M	M	H	H	H	H	H	L	M	H	M

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Dr. B. NARASIMHAN	Dr. N. KAVITHA

Course Code	Title		
23U3DTE612	Elective III : Introduction to Social media Analytics		
Semester: VI	Credits: 4	CIA: 25 Marks	ESE: 75 Marks

Course Objective	To Process and Analyzing the **Network fundamentals and models**
Course Category	Skill Development
Development Needs	Global
Course Description	To Analyze page audience. Reach and Engagement analysis.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Understand the basics of Social media landscape	Lecture	Assignment
CO 2	Understand the Concept of Graphs and Matrices	Tutorial	Seminar
CO 3	Understand the Concept of Structure Data	Lectures	Quiz
CO 4	Analyzing page audience. Reach and Engagement analysis	Tutorial	Program Execution
CO 5	Create Applications in Advertising and Game Analytics	Lecture	Program Execution

Offered by | **Computer Science(Data Science)**

Course Content | **Instructional Hours / Week : 6**

Unit	Description	Text Book	Chapters
I	**Introduction to Social Media Analytics (SMA):** Social media landscape, Need for SMA; SMA in Small organizations; SMA in large organizations; Application of SMA in different areas - Data Identification – Structure – Region – Language – Type of Content – Venue – Time – Casting Net – Regular Expression .	1	1,2
		Instructional Hours	**18**
Suggested Learning Methods : Video lectures about Python Programming			
II	**Network fundamentals and models:** The social networks perspective - nodes, ties and influencers, Social network and web data and methods. Graphs and Matrices- Basic measures for individuals and networks. Information visualization	2	3
		Instructional Hours	18
Suggested Learning Methods: Practice using Flow Charts			
III	**Predictive Versus Descriptive Analytics –** Structure Data VS Unstructured Data – Professional Networking Sites – Data Analysis – External Social Midea - Internal Social Midea – Velocity of Data.	1	4
		Instructional Hours	18
Suggested Learning Methods : Develop small programmes using tuples			
IV	**Facebook Analytics:** Introduction, parameters, demographics. Analyzing page audience. Reach and Engagement analysis. Post performance on FB, Use of Facebook Business Manager; Social campaigns. Measuring and Analyzing social campaigns, defining goals and evaluating outcomes, Network Analysis. (LinkedIn, Instagram, YouTube Twitter etc.	2	5

		Instructional Hours	18
Suggested Learning Methods : Apply the programs in the Python Software			
V	**Processing and Visualizing Data**, Influence Maximization, Link Prediction, Collective Classification. Applications in Advertising and Game Analytics (Use of tools like Unity30 / PyCharm). Introduction to Python Programming, Collecting and analyzing social media data; visualization and exploration.	2	16
		Instructional Hours	18
Suggested Learning Methods : Laboratory practice			
		Total Hours	90 Hrs

Text Books	5. Mathew Ganis, Avinash Koihrkar, Social Media Analytics, I BM Press, 2015
Reference Books	6. J im Sterne, Social Media Metrics, W iley
Web. URLs	Social Media Analytics Strategy - Google Books

Tools for Assessment (20 Marks)

CIA I	CIA II	CIA III	Assignment	Seminar	Quiz	Total
5	5	6	3	3	3	25

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	H	L	M	M	L	M	M	H	H	M	M
CO2	M	M	M	M	H	M	M	M	H	H	H	M	H
CO3	H	L	M	H	M	M	L	H	M	H	H	M	M
CO4	M	H	L	M	L	L	H	M	H	M	H	H	M
CO5	M	M	H	H	M	H	M	H	H	H	M	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
R. ANITHA	Dr. N. KAVITHA

Course Code	Title		
23U3DTV613	**Project & Viva-Voce**		
Semester: VI	**Credits: 4**	**CIA :40Marks**	**ESE:60 Marks**
Course Objective	To give project based learning which makes the students to apply practically what they learned.		
Course Category	Employability		
Development Needs	Global		
Course Description	Develop Problem Solving Skills tosolve the computer based problems at Global needs.		

Course Outcomes		**Teaching Methods**	**Assessment Methods**
CO 1	Remember the fundamental concepts of algorithm and designs	Lecture	Review
CO 2	Understand the optimal methods and Software Engineering concepts to be applied	Constructivist Approach	Review
CO 3	Apply the knowledge and what they learned	Video Lessons	Review
CO 4	Analyze the Economical and Technical feasibility	Tutorial	Program Execution
CO 5	Develop software basedapplications and Deployment of software	Lecture	Program Execution

Offered by	**Computer Science**

Course Content	**Instructional Hours / Week : 6**

Unit	Description	Text Book	Chapters
I	**PROJECT WORK** Title of the Project A project report submitted to the Bharathiar University in the partial fulfillment of the requirements for the award of the degree of BACHELOR OF COMPUTER SCIENCE Submitted by Name of the Student (Reg.No) Under the Guidance of Guide Name (Designation) <College emblem> NEHRU ARTS AND SCIENCE COLLEGE (Autonomous) (Reaccredited by NAAC with “A” Grade, ISO 9001-2008 & ISO		

14001 : 2004 Certified)

RECOGNIZED BY UGC & AFFILIATED TO BHARATHIAR UNIVERSITY

"NEHRU GARDENS", T. M. PALAYAM, COIMBATORE – 641 105.

Month & year

TABLE OF CONTENTS

	A. Sample Screens B. Reports		
		Instructional Hours	**60**

Tools for Assessment (30 Marks)

Review - I	Review - II	Review - III	Document, Preparation and Implementation	Total
7	7	7	9	30

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO 5
CO1	H	H	H	L	M	M	L	M	M	H	H	M	M
CO2	M	M	M	M	H	M	M	M	H	H	H	M	H
CO3	H	L	M	H	M	M	L	H	M	H	H	M	M
CO4	M	H	L	M	L	L	H	M	H	M	H	H	M
CO5	M	M	H	H	M	H	M	H	H	H	M	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
Dr. D.Vimal Kumar	Dr. N. Kavitha

Course Code	Title		
23U4DTZ604	Skill Based Paper-IV: Practical in Big Data Analytics		
Semester: VI	Credits: 3	CIA: 30 Marks	ESE: 45 Marks

Course Objective	To impart the architectural concepts of Hadoop and introducing map reduce paradigm to practice business decisions and create competitive advantage with Big Data.
Course Category	Skill Development
Development Needs	Global
Course Description	To development skill set in Hadoop and apply the concepts to develop applications in order to meet the Local and Global needs Course Outcomes.

Course Outcomes		Teaching Methods	Assessment Methods
CO 1	Install Hadoop.	Program Demonstration	Program Creativity
CO 2	Implement best practices for Hadoop development	Program Demonstration	Debugging
CO 3	Implement Map Reduce programs for processing big data	Program Demonstration	Application of Logic
CO 4	Practice programming tools PIG and HIVE in Hadoop eco system.	Program Demonstration	Program Development
CO 5	Analyze big data using linear models	Program Demonstration	Program Development

Offered by	**Computer Science(Data Science)**
Course Content	**Instructional Hours / Week : 5**

Program List

1. Install, configure and run Hadoop and HDFS
2. Implement the file management tasks in Hadoop
3. Implement word count / frequency programs using MapReduce
4. Implement matrix multiplication with Hadoop MapReduce
5. Implement an MR program that processes a weather dataset R
6. Implement basic Word Count MapReduce program to understand MapReduce Paradigm: To countwords in a given file, To view the output file, and To calculate execution time.
7. Implement Linear and logistic Regression

8. Implement SVM / Decision tree classification techniques
9. Implement clustering techniques
10. Visualize data using any plotting framework
11. Implement an application that stores big data in HBase / MongoDB / Pig using Hadoop / R

Total Hours	75 Hrs

Tools for Assessment (30 Marks)

Application of Logics	Program Creativity	Code Debugging	Test 1	Test 2	Observation Note Book	Total
4	**4**	**4**	**7**	**7**	4	**30**

Mapping

CO \ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	L	M	H	L	M	H	H	H	H	M	M
CO2	H	H	L	M	H	L	M	H	H	H	H	M	M
CO3	H	H	L	M	H	L	M	H	H	H	H	H	H
CO4	H	H	L	M	H	L	M	H	H	H	H	H	H
CO5	H	H	L	M	H	L	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
D. J. ANITHA MERLIN	Dr. N. KAVITHA

EXTRA DEPARTMENTAL COURSE

Course Code	Title	
22U4CS3ED1	Extra Departmental Course : Multimedia Technologies	
Semester : III	Credits:2	ESE: 50 Marks

Common to B. Sc. CS/ CS (DS)

Course Objective:

To develop the skill & knowledge of Graphic Designing in Multimedia. Students will understand the knowhow and can function either as an entrepreneur or can take up jobs in the multimedia industry, photography & video studios, edit set-up, graphic arts industry and other audio visual sectors.

Course Outcomes:

CO1	List the basic concept and use of composition using principles, characteristics and forms of Visual Design in Multimedia Development
CO2	Infer the knowledge to acquire Visual Reading Elements
CO3	Construct the concept of color and its application in the preparation of advertising Material
CO4	Analyze the basics of art & aesthetic skill to create interactive design
CO5	To build a website with planning and visual design

Offered by: Computer Science

Course Content **Instructional Hours / Week: 2**

Unit	Description	Text Book		Chapter
I	**Introduction to Multimedia:** What is Multimedia?- Types of Multimedia productions- The development of multimedia-Connecting to the internet-Multimedia and Education.	1		1,2,3
	Instructional Hours			6
II	**Multimedia Components:** Text: The role of text in multimedia-Working with text- **Formatting Text**: Font choice, Alignment, lists, Text spacing, Special formatting and Effects, Text wraps -Using fonts-Font selection Guidelines.	1		7
	Instructional Hours			6
III	**Graphics and Animation:** The role of graphics in multimedia- Computer graphics Technology- Editing Graphics-**Animation**: Frame based animations-Vector Animations-Morphing-3-D Graphics and Virtual Reality.	1		8
	Instructional Hours			6
IV	**Multimedia Audio and Video: Audio :**Audio on PC's, Sound quality, Audio file size, Streaming Audio, Audio File Formats-Software and Hardware for Audio. **Video**: Video quality, Streaming video-Video file formats- Software and Hardware for Video.	1		11
	Instructional Hours			6
V	**Multimedia Website Design:** Web Site Organization-Web site Goals-Design considerations – **Planning and building a WebSite:** Defining the Web site's goals, Defining the target	1	4	13
	Audience, Tools for planning, Content, Interaction, Visual Design, Web Page Design Guidelines.			
	Instructional Hours			**6**
	Total Hours			**30**

Text Book(s):

1. Ana Weston Solomon, "**Introduction to multimedia"** Tata McGraw-Hill, 2005.
   Unit I: 1.1 to 1.3, 2.2, 3.4 (Chapter 1, 2, 3)
   Unit II: 7.1 to 7.5 (Chapter 7)
   Unit III: 8.1 to 8.4 (Chapter 8)
   Unit IV: 9.1 to 9.2, 10.1 to 10.2(Chapter 9, 10)

Reference Book(s):

1. Nigel Chapman and Jenny Chapman "**Digital Multimedia**", WILEY.

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	L	M	H	L	M	H	H	H	H	M	M
CO2	H	H	L	M	H	L	M	H	H	H	H	M	M
CO3	H	H	L	M	H	L	M	H	H	H	H	H	H
CO4	H	H	L	M	H	L	M	H	H	H	H	H	H
CO5	H	H	L	M	H	L	M	H	H	H	H	H	H

H-High; M-Medium; L-Low

Course designed by	Verified by Chairman
R. ANITHA	Dr. N. KAVITHA

Course Code	Title	
22U4CS3ED2	Extra Departmental Course : Web Designing	
Semester : III	Credits: 2	ESE: 50 Marks

Common to B. Sc. CS/ CS(DS)

Course Objective:

To develop the skill & knowledge of Web page designing. Students will understand the function either as an entrepreneur or can take up jobs in the Web site development studio and other information technology sectors.

Course Outcomes:

CO1	Define the principle of Web page design to understand the structure of HTML
CO2	Classify the knowledge about well-structured, easily maintained, accessible HTML code
CO3	Apply the basic concept of HTML and Recognize the elements to Visualize HTML.
CO4	To Construct a website using table elements and frames elements.
CO5	Examine the HTML concepts to develop the web page using the concept of HTML and CSS.

Offered by: Computer Science

Course Content **Instructional Hours / Week: 2**

Unit	Description	Text Book	Chapter
I	**Introduction to HTML:** Origins of Hyper Text Markup Language (HTML)-The HTML Specification-The structure and functions of HTML-The Role of HTTP-Coding HTML Documents.	1	1
	Instructional Hours		6
II	**Basic Page Structure:** Create an HTML file-naming conventions- preview an HTML file in browser. **HTML Page formatting Basics**- The HTML document type Definition (DTD) and elements- Attributes- Character entity references (Special Characters) - the basic structure of HTML documents.	2,1	2
	Instructional Hours		**6**
III	**HTML Elements:** Types of HTML Elements- **Advanced Web page Formatting:** The FONT and BASEFONT Elements- Lists and UL,OL and LI elements-Definition lists and DL Element-HTML Hypertext Links- The A and LINK elements.	1	3
	Instructional Hours		6
IV	**Tables and Frames:** Introduction to Tables- The TABLE Element- Table formatting and CAPTION Element-THEAD,TFOOT and TBODY Elements- COL, Rows, TR, TH, TD Element-FRAMESET Elements- Retrieving frame content with FRAME Elements.	1	6
	Instructional Hours		6

V	**Cascading Style Sheets:** CSS selectors and Syntax- Setting the Style sheet language for HTML documents-Style sheet files and	1	8
	External Style Sheets- Cascading Style Sheets- Dynamic HTML- Using Dynamic HTML with Internet Explorer.		
	Instructional Hours		**6**
	Total Hours		**30**

Text Book(s):

1. David Mercer, **HTML Introduction to Web Page Design and Development**, Tata McGraw-Hill 2004.
2. Wendy Willard, **HTML A Beginners Guide**, Third Edition, Tata McGraw-Hill-2007.

Unit I: Section 1.1 to 1.3, 1.5, 1.7 (Chapter 1)
Unit II: Section 2.1 to 2.2 (Chapter 2 in Book2), 2.1,2.3,2.5 to 2.6(Chapter 2 inBook1)
Unit III: Section 2.7 to 2.11, 2.13 to 2.16, 3.1 to 3.3, 3.5 to 3.6 (Chapter 2 and 3)
Unit IV: Section 6.1 to 6.4, 6.6 to 6.8, 6.10 to 6.11(Chapter 6)
Unit V: Section 8.2 to 8.3, 8.7 to 8.8, 8.12, 8.14 (Chapter 8)

Reference Book(s):

1. Murray, Tom/Lynchburg, **Creating a Web Page and Web Site**,2002

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	L	M	H	L	M	H	H	H	H	M	M
CO2	H	H	L	M	H	L	M	H	H	H	H	M	M
CO3	H	H	L	M	H	L	M	H	H	H	H	H	H
CO4	H	H	L	M	H	L	M	H	H	H	H	H	H
CO5	H	H	L	M	H	L	M	H	H	H	H	H	H

H-High; M-Medium; L-Low.

Course designed by	Verified by Chairman
D. J. ANITHA MERLIN	Dr. N. KAVITHA

Course Code	Title	
22UCSSS01	Self Study Paper : Libre Office	
Semester: II - V	Credits: 1	ESE : 50 Marks

Common to B. Sc. CS/ CS(DS)

Course Objective:

Introduces the basic features of Libre Office, Writer, Calc, Impress.

Course Outcome:

- Recognize when to use each of the Microsoft Office programs to create professional business documents.
- Use Microsoft Office programs to create personal and/or business documents following current professional and/or industry standards.
- Pursue future courses specializing in one or more of the programs.

Offered by: Computer Science

Course Content

Unit	Description	Text Book	Chapter
I	Introducing Libre Office – What is Libre Office – Advantages – Minimum Requirement – How to get and Install the Software – Extensions and Add-Ons – How to get Help – Starting Libre Office – Parts of Main Window – Starting a New Document – Opening - Saving – Renaming and Deleting – Navigator – Undoing and Redoing – Closing a Document and Libre Office -	1	1
II	Getting Started with Writer – Introducing – Setting Up – Working – Formatting – Introduction to Styles – Working with Graphics – Working with Tables – Working with Templates in Writer – Using Mail Merge – Creating Tables – Working with Master Documents – Working with Fields – Using Forms in Writer – Customizing Writer	1	4
III	Getting Started with Calc – Introducing – Entering, Editing, Formatting – Using Charts and Graphs – Using Styles and Templates – Using Graphics in Calc – Printing, Exporting and E-mailing – Formulas and Functions – Using the Datapilot – Data Analysis – Linking Calc Data – Sharing and Reviewing – Calc Marcos – Calc as a simple DataBase	1	5
IV	Getting Started with Impress – Introducing – Using Slide Masters – Adding and Formatting text – Pictures – Managing and Formatting Graphic Objects – Including Spread Sheets, Charts and Other Objects – Adding and Formatting Slides, Notes, and Handouts – Slideshows – Printing, E-mailing, Exporting and Saving Slide Shows	1	6
V	Getting Started with Draw – Introducing Draw – Drawing Basic Shapes – Working with Objects and Object Points – Changing Object Attributes – Combining Multiple Objects – Editing Pictures – Working with 3D Objects – Tips and Tricks - Organization Charts – Flow Diagrams – Advanced Draw Technique	1	7

Text Book :

1. Libre Office – Getting Started Guide, 2017

Reference Books:

1. http://www.open-of-course.org/courses/course/view.php?id=86.

Course designed by	Verified by Chairman
Dr. N. KAVITHA	Dr. N. KAVITHA

Course Code	Title	
22UCSSS02	Self Study Paper : Management Information System	
Semester : II - V	Credits: 1	ESE: 50 Marks

Common to B. Sc. CS/ CS(DS)

Course Objective:

To enable the students to know the Integration of Business Information, Learn the coreactivities in the systems development process.

Course Outcomes:

CO1	Understand the usage of Information Systems in management
CO2	Understand the activities that are undertaken in acquiring an Information System in an organization
CO3	Analyze and synthesize business information needs to facilitate evaluation of strategic alternatives
CO4	Learn to aware of utilization on business information for decision making

Offered by : Computer Science

Course Content :

Unit	Description	Text Book	Chapter
I	**Management Information System :** Meaning – Features – Requisites of an effective MIS –MIS Model – Components – Subsystems of an MIS – Role and Importance – CorporatePlanning for MIS – Growth of MIS in an Organization - Centralization Vs. Decentralization of MIS – Limitations of MIS.	1	1
II	**System Concepts**: – Elements of a System- Characteristics of a system - Types of System–Categories of Information System – System Development Life Cycle – System Enhancement.	1	3
III	**Information Systems Requirements**: Developing Long Range Information System Plan – Strategies for the Determination of Information Requirements- Database requirements-User Interface Requirements.	2	5
IV	**Conceptual Foundations**: The Decision Making Process-Concepts of Information-Humans as Information Processors-System Concepts-Concepts of Planning and Control-Organizational Structure and Management concepts.	2	3
V	**Development, Implementation, and Management of Information System Resources:** Developing and Implementing Application Systems-Quality Assurance and Evaluation of Information Systems-Organization and Management of the Information Resources Function- Future Developments and Their Organizational and Social Implications.	2	6

Text Book(s):

1. Aman Jindal**, Management Information System**, Kalyani Publishers, New Delhi, First

Edition,2003.

Unit I : Section 2.2 to 2.5 , 2.14 to 2.24 (Chapter 2)

Unit II : Section 1.1 to 1.5, 2.2, 3.6,3.7 (Chapter 1,2 and 3)

2. Gordon B. Davis, Margrethe H. Olson, **Management Information Systems,** Tata McGraw Hill, Second Edition, 2008.

Unit III : Chapter 14, 15,16,17

Unit IV : Chapter 6,7,8,9,10 and 11

Unit V : Section 18,19,20,21 (Chapter 18, 19, 20 and 21)

Reference Book(s):

1. P.Mohan**, Management Information System**, Himalaya Publishing house, New Delhi, First Edition,2007.

Course designed by	Verified by Chairman
Dr. N. KAVITHA	Dr. N. KAVITHA

Course Code	Title	
23U4CS3ED2	Extra Departmental Course : Web Designing	
Semester : III	Credits: 2	ESE: 50 Marks

Common to B. Sc. CS/ B. Sc. CS (DS)/ AIML

Course Objective:

To develop the skill & knowledge of Web page designing. Students will understand the function either as an entrepreneur or can take up jobs in the Web site development studio and other information technology sectors.

Course Outcomes:

CO1	Define the principle of Web page design to understand the structure of HTML
CO2	Classify the knowledge about well-structured, easily maintained, accessible HTML code
CO3	Apply the basic concept of HTML and Recognize the elements to Visualize HTML.
CO4	To Construct a website using table elements and frames elements.
CO5	Examine the HTML concepts to develop the web page using the concept of HTML and CSS.

Offered by: Computer Science

Course Content **Instructional Hours / Week: 2**

Unit	Description	Text Book	Chapter
I	**Introduction to HTML:** Origins of Hyper Text Markup Language (HTML)-The HTML Specification-The structure and functions of HTML-The Role of HTTP-Coding HTML Documents.	1	1
	Instructional Hours		6
II	**Basic Page Structure:** Create an HTML file-naming conventions- preview an HTML file in browser. **HTML Page formatting Basics-** The HTML document type Definition (DTD) and elements- Attributes- Character entity references (Special Characters) - the basic structure of HTML documents.	2,1	2
	Instructional Hours		**6**
III	**HTML Elements:** Types of HTML Elements- **Advanced Web page Formatting:** The FONT and BASEFONT Elements- Lists and UL,OL and LI elements-Definition lists and DL Element-HTML Hypertext Links- The A and LINK elements.	1	3
	Instructional Hours		6
IV	**Tables and Frames:** Introduction to Tables- The TABLE Element- Table formatting and CAPTION Element-THEAD,TFOOT and TBODY Elements- COL, Rows, TR, TH, TD Element-FRAMESET Elements- Retrieving frame content with FRAME Elements.	1	6
	Instructional Hours		6
V	**Cascading Style Sheets:** CSS selectors and Syntax- Setting the Style sheet language for HTML documents-Style sheet files and	1	8

External Style Sheets- Cascading Style Sheets- Dynamic HTML- Using Dynamic HTML with Internet Explorer.	
Instructional Hours	**6**
Total Hours	**30**

Text Book(s):

1. David Mercer, **HTML Introduction to Web Page Design and Development**, Tata McGraw-Hill 2004.
2. Wendy Willard, **HTML A Beginners Guide**, Third Edition, Tata McGraw-Hill-2007.

Unit I: Section 1.1 to 1.3, 1.5, 1.7 (Chapter 1)
Unit II: Section 2.1 to 2.2 (Chapter 2 in Book2), 2.1,2.3,2.5 to 2.6(Chapter 2 in Book1)
Unit III: Section 2.7 to 2.11, 2.13 to 2.16, 3.1 to 3.3, 3.5 to 3.6 (Chapter 2 and 3)
Unit IV: Section 6.1 to 6.4, 6.6 to 6.8, 6.10 to 6.11(Chapter 6)
Unit V: Section 8.2 to 8.3, 8.7 to 8.8, 8.12, 8.14 (Chapter 8)

Reference Book(s):

1. Murray, Tom/Lynchburg, **Creating a Web Page and Web Site**,2002

Mapping

PO / CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	H	H	L	M	H	L	M	H	H	H	H	M	M
CO2	H	H	L	M	H	L	M	H	H	H	H	M	M
CO3	H	H	L	M	H	L	M	H	H	H	H	H	H
CO4	H	H	L	M	H	L	M	H	H	H	H	H	H
CO5	H	H	L	M	H	L	M	H	H	H	H	H	H

H-High; M-Medium; L-Low.

Course designed by	Verified by Chairman
D. J. ANITHA MERLIN	DR. N. KAVITHA

SELF STUDY PAPERS

Course Code	Title	
22UCSSS01	Self Study Paper : Libre Office	
Semester: II - V	Credits: 1	ESE : 50 Marks

Course Objective:
Introduces the basic features of Libre Office, Writer, Calc, Impress.

Course Outcome:

- Recognize when to use each of the Microsoft Office programs to create professional business documents.
- Use Microsoft Office programs to create personal and/or business documents following current professional and/or industry standards.
- Pursue future courses specializing in one or more of the programs.

Offered by: Computer Science

Course Content

Unit	Description	Text Book	Chapter
I	Introducing Libre Office – What is Libre Office – Advantages – Minimum Requirement – How to get and Install the Software – Extensions and Add-Ons – How to get Help – Starting Libre Office – Parts of Main Window – Starting a New Document – Opening - Saving – Renaming and Deleting – Navigator – Undoing and Redoing – Closing a Document and Libre Office -	1	1
II	Getting Started with Writer – Introducing – Setting Up – Working – Formatting – Introduction to Styles – Working with Graphics – Working with Tables – Working with Templates in Writer – Using Mail Merge – Creating Tables – Working with Master Documents – Working with Fields – Using Forms in Writer – Customizing Writer	1	4
III	Getting Started with Calc – Introducing – Entering, Editing, Formatting – Using Charts and Graphs – Using Styles and Templates – Using Graphics in Calc – Printing, Exporting and E-mailing – Formulas and Functions – Using the Datapilot – Data Analysis – Linking Calc Data – Sharing and Reviewing – Calc Marcos – Calc as a simple DataBase	1	5
IV	Getting Started with Impress – Introducing – Using Slide Masters – Adding and Formatting text – Pictures – Managing and Formatting Graphic Objects – Including Spread Sheets, Charts and Other Objects – Adding and Formatting Slides, Notes, and Handouts – Slideshows – Printing, E-mailing, Exporting and Saving Slide Shows	1	6
V	Getting Started with Draw – Introducing Draw – Drawing Basic Shapes – Working with Objects and Object Points – Changing	1	7

	Object Attributes – Combining Multiple Objects – Editing Pictures – Working with 3D Objects – Tips and Tricks - Organization Charts – Flow Diagrams – Advanced Draw Technique

Text Book :

1. Libre Office – Getting Started Guide, 2017

Reference Books:

1. http://www.open-of-course.org/courses/course/view.php?id=86.

Course designed by	Verified by Chairman
DR. N, KAVITHA	DR. N, KAVITHA

Course Code	Title	
22UCSSS02	Self Study Paper : Management Information System	
Semester : II - V	Credits: 1	ESE: 50 Marks

Course Objective:

To enable the students to know the Integration of Business Information, Learn the core activities in the systems development process.

Course Outcomes:

CO1	Understand the usage of Information Systems in management
CO2	Understand the activities that are undertaken in acquiring an Information System in an organization
CO3	Analyze and synthesize business information needs to facilitate evaluation of strategic alternatives
CO4	Learn to aware of utilization on business information for decision making

Offered by : Computer Science

Course Content :

Unit	Description	Text Book	Chapter
I	**Management Information System :** Meaning – Features – Requisites of an effective MIS –MIS Model – Components – Subsystems of an MIS – Role and Importance – CorporatePlanning for MIS – Growth of MIS in an Organization - Centralization Vs. Decentralization of MIS – Limitations of MIS.	1	1
II	**System Concepts**: – Elements of a System- Characteristics of a system - Types of System–Categories of Information System – System Development Life Cycle – System Enhancement.	1	3
III	**Information Systems Requirements**: Developing Long Range Information System Plan – Strategies for the Determination of Information Requirements- Database requirements-User Interface Requirements.	2	5
IV	**Conceptual Foundations**: The Decision Making Process-Concepts of Information-Humans as Information Processors-System Concepts-Concepts of Planning and Control-Organizational Structure and Management concepts.	2	3

V	**Development, Implementation, and Management of Information System Resources:** Developing and Implementing Application Systems-Quality Assurance and Evaluation of Information Systems-Organization and Management of the Information Resources Function- Future Developments and Their Organizational and Social Implications.	2	6

Text Book(s):

1. Aman Jindal, **Management Information System**, Kalyani Publishers, New Delhi, First Edition,2003.

   Unit I : Section 2.2 to 2.5 , 2.14 to 2.24 (Chapter 2)

   Unit II : Section 1.1 to 1.5, 2.2, 3.6,3.7 (Chapter 1,2 and 3)

2. Gordon B. Davis, Margrethe H. Olson, **Management Information Systems,** Tata McGraw Hill, Second Edition, 2008.

   Unit III : Chapter 14, 15,16,17

   Unit IV : Chapter 6,7,8,9,10 and 11

   Unit V : Section 18,19,20,21 (Chapter 18, 19, 20 and 21)

Reference Book(s):

1. P.Mohan, **Management Information System,** Himalaya Publishing house, New Delhi,First Edition,2007.

Course designed by	Verified by Chairman
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9/9/2023
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