Dr. N.G.P. ARTS AND SCIENCE COLLEGE

(An Autonomous Institution, Affiliated to Bharathiar University, Coimbatore
Approved by Government of Tamilnadu and Accredited by NAAC with 'A++' Grade (3rdCycle)
Dr. N.G.P.- Kalapatti Road, Coimbatore-641048, Tamilnadu, India
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REGULATIONS 2022-23 for Under Graduate Programme

(Outcome Based Education model with Choice Based Credit System)

Bachelor of Computer Applications

(For the students admitted during the academic year 2022-23)

Programme : BCA

Eligibility

Candidates for admission to the first year of the **Bachelor of Computer Applications** Degree Programme shall be required to have passed in the Higher Secondary Examinations conducted by the Government of Tamil Nadu in the relevant subjects or an Examination accepted as equivalent thereto by the Academic Council. Subject to such other conditions as may be prescribed there to are permitted to appear and qualify with any one of the following subjects: Mathematics / Computer Science / Computer Applications and wherever the students have not studied Mathematics, the necessary Mathematics knowledge be imparted through Tutorial/ Bridge Course.

Programme Educational Objectives

The Curriculum is designed to attain the following learning goals which students shall accomplish by the time of their graduation:

1. Demonstrating a substantial understanding of concepts in key areas of information technology and its applications.
2. Analysis and synthesis involved in computer system, information system and computer applications.
3. To develop a software and in its design and implementation for professional competence
4. To equip and train the students to meet the requirement of the IT Industries and public sectors.
5. To stimulate an interest in computing as an academic discipline with a view to encouraging progression to research and higher studies.

PROGRAMME OUTCOMES

On the successful completion of the program, the following are the expected outcomes.

PO Number	POStatement
PO1	Understand the concepts of key areas in Computer Applications.
PO2	Develop student's profession and ethical attitudes, effective Communication, team work and logical proficiency.
PO3	Apply knowledge of mathematical, algorithmic and computing Skills.
PO4	Make use of modern tools and techniques to develop software.
PO5	Develop practical skills to fulfill the needs of industry and Society.

Bachelor of Computer Applications

Credits Distribution

Part	Subjects	No. of Papers	Credit	Semester No.
I (12 Credits)	Tamil / Hindi / French/Malayalam	4	4 x 3 = 12	I - IV
II (12 Credits)	English	4	4 x 3 = 12	I - IV
III (108 Credits)	Core (Credits 3)	2	2 x 3 = 6	I - VI
	Core (Credits 4)	11	11x4 = 44	I - VI
	Core Practical (Credits 2)	05	05x2=10	I - VI
	Core Practical (Credits 5)- Embedded	02	02x5=10	III-IV
	Inter Departmental Course (IDC)	4	4x4=16	I - IV
	Discipline Specific Elective (DSE)	3	3 x 4 =12	V & VI
	Skill Enhancement Course (SEC)	4	4x2=8	III to VI
	Industrial Training	1	1X2=2	V
IV (8 Credits)	Environmental Studies (AECC)	1	1x2=2	I
	Basic Tamil/Advanced Tamil/Human Rights, & Women's Rights (AECC)	1	1x2=2	II
	Generic Elective (GE)	1	1x2=2	V
	Innovation & IPR/ Innovation, IPR & Entrepreneurship (AECC)	1	1x2=2	VI
V (2 Credits)	NSS/NCC/YRC/RRC/Yoga/Sports/ Clubs	-	1x2=2	I - II
TOTAL CREDITS			**142**	

CURRICULUM
BCA PROGRAMME

Course Code	Course Category	Course Name	L	T	P	Exam (hours)	Max Marks			Credits
							CIA	ESE	Total	
First Semester										
Part– I										
221TL1A1TA	Language-I	Tamil–I : Ikkala Ilakkiyam	4	1	-	3	50	50	100	3
221TL1A1HA		Hindi-I : Modern Literature								
221TL1A1MA		Malayalam-I : Modern Literature								
221TL1A1FA		French –I: Grammar, Translation and Civilization								
Part– II										
221EL1A1EA	Language-II	Professional English -I	4	-	1	3	50	50	100	3
Part– III										
224AI1A1CA	Core-I	Problem Solving and Programming in C	4	1	-	3	50	50	100	4
224CA1A1CP	Core Practical-I	C Programming	-	-	4	3	50	50	100	2
224IT1A1CA	Core-II	Digital Computer Fundamentals	4	-	-	3	50	50	100	4
222MT1A1IC	IDC-I	Numerical Methods and Statistics	4	1	-	3	50	50	100	4
Part-IV										
223MB1A1AA	AECC-I	Environmental Studies	2	-	-	-	50	-	50	2
Part-V										
224CA1A1XA	Extension Activity	NSS/NCC/ YRC/RRC/ Yoga/Sports/ Clubs	-	-	-	-	50	-	50	1
Total			**22**	**3**	**5**	**-**	**-**	**-**	**700**	**23**

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13th	AC - 13th	GB - 18th
29-7-22	6-9-22	10-9-22

Academic Council
Dr.V. Rajendran
CHAIRMAN
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Course Code	Course Category	Course Name	L	T	P	Exam (hrs)	Max Marks			Credits
							CIA	ESE	Total	
Second Semester										
Part-I										
221TL1A2TA	Language-I	Tamil–II : Ara Ilakkiyam	4	1	-	3	50	50	100	3
221TL1A2HA		Hindi-II : Modern Literature								
221TL1A2MA		Malayalam-II : Modern Literature								
221TL1A2FA		French –II : Grammar, Translation and Civilization								
Part– II										
221EL1A2EA	Language-II	Professional English -II	4	-	1	3	50	50	100	3
Part– III										
224CA1A2CA	Core - III	Data Structures	4	1	-	3	50	50	100	4
224CS1A2CA	Core - IV	Object Oriented Programming with C++	4	-	-	3	50	50	100	4
224CA1A2CP	Core Practical – II	Data Structures and C++	-	-	4	3	50	50	100	2
222MT1A2IC	IDC - II	Discrete Mathematics	4	1	-	3	50	50	100	4
Part-IV										
221TL1A2AA	AECC-II	Basic Tamil	2	-	-	-	50	-	50	2
221TL1A2AB		Advanced Tamil								
225CR1A2AA		Human Rights and Women's Rights								
Part-V										
224CA1A2XA	Extension Activity	NSS/NCC/YRC /RRC/Yoga /Sports/Clubs	-	-	-	-	50	-	50	1
		Total	22	3	5	-	-	-	700	23

2/12/22
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2-12-22	19.01.23	30.01.23

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Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
Third Semester										
Part - I										
221TL1A3TA	Language-I	Tamil-III	3	1	-	3	50	50	100	3
221TL1A3HA		Hindi -III								
221TL1A3MA		Malayalam - III								
221TL1A3FA		French - III								
Part - II										
221EL1A3EA	Language-II	Professional English -III	3	1	-	3	50	50	100	3
Part - III										
224CA1A3CA	Core-V	Database Management Systems	4	-	-	3	50	50	100	4
224CT1A3CP	Core Practical-III	Java Programming	3	-	4	3	50	50	100	5
224CS1A3CA	Core-VI	Operating Systems	3	-	-	3	50	50	100	3
224CA1A3SP	SEC Practical-I	SQL Programming	-	-	4	3	50	50	100	2
225PA1A3IA	IDC-III	Business Accounting	4	-	-	3	50	50	100	4
Total			**20**	**2**	**8**	-	-	-	**700**	**24**

9/6/23
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Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
Fourth Semester										
Part–I										
221TL1A4TA	Language-I	Tamil-IV	3	1	-	3	50	50	100	3
221TL1A4HA		Hindi -IV								
221TL1A4MA		Malayalam - IV								
221TL1A4FA		French - IV								
Part -II										
221EL1A4EA	Language-II	Professional English -IV	3	1	-	3	50	50	100	3
Part -III										
224CT1A4CA	Core-VII	Computer Networks	4	-	-	3	50	50	100	4
224CA1A4EP	Embedded Practical	Python Programming	3	-	4	3	50	50	100	5
224CA1A4CB	Core-VIII	Cyber Security	3	-	-	3	50	50	100	3
224CA1A4SP	SEC Practical-II	Big Data Technologies	-	-	4	3	50	50	100	2
222MT1A4IC	IDC-IV	Operations Research	4	-	-	3	50	50	100	4
Total			**20**	**2**	**8**	-	-	-	**700**	**24**

16/11/23
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Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
Fifth Semester										
Part–III										
224CA1A5CA	Core- IX	Artificial Intelligence and Expert Systems	4	-	-	3	50	50	100	4
224CA1A5CB	Core-X	C# Programming	4	-	-	3	50	50	100	4
224CA1A5CC	Core-XI	Software Engineering Concepts	4	-	-	3	50	50	100	4
224CA1A5CP	Core Practical- IV	Software Testing	-	-	4	3	50	50	100	2
224CA1A5CQ	Core Practical-V	C# Programming	-	-	4	3	50	50	100	2
224CA1A5SP	SEC Practical - III	Web Design and Development	-	-	4	3	50	50	100	2
224CA1A5DA	DSE –I	Computer Graphics	4	-	-	3	50	50	100	4
224CA1A5DB		Data Mining								
224CA1A5DC		Internet of Things and Applications								
224CA1A5TA	IT	Industrial Training	-	-	-	3	50	50	100	2
Part -IV										
224CA1A5GA	GE	Spreadsheet Applications	2	-	-	3	50	-	50	2
Total			**18**	**-**	**12**	**-**	**-**	**-**	**850**	**26**

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Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
Sixth Semester										
Part–III										
224CA1A6CA	Core-XII	Open Source Technologies	4	-	-	3	50	50	100	4
224CA1A6CP	Core Practical - VI	Open Source Technologies	-	-	4	3	50	50	100	2
224CA1A6CV	Core-XIII	Project and Viva voce	-	-	8	3	50	50	100	4
224CA1A6SP	SEC Practical-IV	Multimedia Technologies	-	-	4	3	50	50	100	2
224CA1A6DA	DSE –II	Computer Vision	4	-	-	3	50	50	100	4
224CA1A6DB		Machine Learning and Applications								
224CA1A6DC		Cloud Technologies								
224CA1A6DD	DSE –III	Augmented Reality and Virtual Reality	4	-	-	3	50	50	100	4
224CA1A6DE		Deep Learning								
224CA1A6DF		Fundamentals of Blockchain and Applications								
PART IV										
223BC1A6AA	AECC - III	Innovation, IPR and Entrepreneurship	2	-	-	3	50	-	50	2
Total			14	-	16	-	-	-	650	22
Grand Total									**4300**	**142**

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DISCIPLINE SPECIFIC ELECTIVE

Students shall select the desired course of their choice in the listed elective course during Semesters V & VI

Semester V (Elective I)

List of Elective Courses

S. No.	Course Code	Name of the Course
1	224CA1A5DA	Computer Graphics
2	224CA1A5DB	Data Mining
3	224CA1A5DC	Internet of Things and Applications

Semester VI (Elective II)

List of Elective Courses

S. No.	Course Code	Name of the Course
1	224CA1A6DA	Computer Vision
2	224CA1A6DB	Machine Learning and Applications
3	224CA1A6DC	Cloud Technologies

Semester VI (Elective III)

List of Elective Courses

S. No.	Course Code	Name of the Course
1	224CA1A6DD	Augmented Reality and Virtual Reality
2	224CA1A6DE	Deep Learning
3	224CA1A6DF	Fundamentals of Blockchain and Applications

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GENERIC ELECTIVE COURSES (GE)

The following are the courses offered under Generic Elective Course

Semester V (GE)

S. No.	Course Code	Name of the Course
1	224CA1A5GA	Spreadsheet Applications

EXTRA CREDIT COURSES

The following are the courses offered under self study to earn extra credits:

Semester III

S. No.	Course Code	Name of the Course
1	224CA1ASSA	Program logic and Computer Fundamentals
2	224CA1ASSB	Internet Technologies

UG - REGULATION (R4)

(Students admitted in the AY 2022-23)

(OUTCOME BASED EDUCATION WITH CBCS)

1.NOMENCLATURE

1.1 Faculty: Refers to a group of programmes concerned with a major division of knowledge Eg. Faculty of Computer Science consists of disciplines like Departments of Computer Science, Information Technology, Computer Technology, Computer Applications, Data analytics, Cognitive Systems and Artificial Intelligence and Machine Learning.

1.2 Programme: Refers to the Bachelor of Science / Commerce /Arts stream that a student has chosen for study.

1.3 Batch: Refers to the starting and completion year of a programme of study. Eg. Batch of 2022–25 refers to students belonging to a 3 year Degree programme admitted in 2022 and completing in 2025.

1.4 Course: Refers to component of a programme. A course may be designed to involve lectures / tutorials / laboratory work / seminar / project work/ practical training / report writing / Viva- voce, etc., or a combination of these, to meet effectively the teaching learning needs.

a) **Core Course:**A course, which should compulsorily be studied by a candidate as a core requirement

b) **Inter Disciplinary Course (IDC):** A course chosen generally from a related discipline/subject with an intention to seek exposure in the discipline relating to the core domain of the student

c) **Discipline Specific Elective (DSE) Course**: Elective courses offered under main discipline/ subject of study.

d) **Skill Enhancement Courses (SEC):** Value-based and/or skill-based courses which are aimed at providing hands-on-training, competencies, skills, etc.

e) **Ability Enhancement Compulsory Courses (AECC):** Mandatory courses that lead to Knowledge enhancement. Environmental Science, Human Rights and Women's Rights, Basic Tamil/Advanced Tamil, Innovation and IPR/Innovation, IPR and Entrepreneurship.

f) **Ability Enhancement Elective Course (AEEC)/Generic Elective (GE)** An elective course chosen generally from an unrelated discipline/subject, with an intention to seek exposure is Generic Elective.

1.5 Project Work:

Course involving application of knowledge in problem solving / analyzing /exploring a real life situation / difficult problem. The Project work will be given in lieu of a Core paper.

Internship/Industrial Training

Students must undertake industrial / institutional training for a minimum of 15 days during the IV semester summer vacation. The students will submit the report for evaluation during V semester.

1.6 Extra Credits:

Extra credits shall be awarded for achievements in identified Curricular/co-curricular activities executed outside the regular class hours. Extra credits are not mandatory for completing the programme.

2. STRUCTURE OF PROGRAMME

2.1 PART- I: LANGUAGE- I

Tamil or any one of the languages namely Malayalam, Hindi and French will be offered under Part – I in the first four semesters.

2.2 PART- II: LANGUAGE- II

English will be offered during the first four semesters.

2.3 PART- III:

- Core Course
- Inter Departmental Course (IDC)
- Discipline Specific Elective (DSE)
- Skill Enhancement Course (SEC)
- Industrial Training (IT)

2.4 PART- IV:

2.4.1 Ability Enhancement Compulsory Course (AECC):

The Ability Enhancement Compulsory Courses such as i)Environmental Studies, ii) Human Rights and Womens' Rights, iii) Innovation and IPR/ Innovation, IPR and Entrepreneurship are offered during I,II and VI Semester.

Basic Tamil

a) Those who have not studied Tamil up to XII Std and taken a non-Tamil language under Part-I shall take one Basic Tamil course in the second semester.

(OR)

Advanced Tamil

b) Those who have studied Tamil up to XII Std and taken a non-Tamil language under Part-I shall take one Advanced Tamil course in the second semester.

Note: Students who come under the above a+b categories are exempted from Human Rights and Women's Rights in second semester.

Ability Enhancement Elective Course (AEEC)/Generic Elective (GE) An elective course chosen generally from an unrelated discipline/subject, with an intention to seek exposure is Generic Elective offered in V semester. (Theory/Practical/Non-Lab Practical)

2.5 PART- V: EXTENSION ACTIVITIES

The following extracurricular activities like NSS/YRC/NCC/RRC/Yoga/Sports/Clubs are offered under extension activities during semester I & II. Students will be evaluated based on their active participation in any one of the above activities. 75% Attendance is compulsory for extension activity.

3. CREDIT ALLOTTMENT

The following is the credit allotment:

- Lecture Hours (Theory) : 1 credit per lecture hour per week
- Laboratory Hours : 1 credit for 2 Practical hours per week
- Project Work : 1 credit for 2 hours of project work per week

4. DURATION OF THE PROGRAMME

The B.A. /B.Com./B. Sc. Programme must be completed within 3 years (6 semesters) and a maximum of 6 years (12 semesters) from the date of acceptance to the programme. If not, the candidate must enroll in the course determined to be an equivalent by BoS in the most recent curriculum recommended for the Programme.

5.REQUIREMENTS FOR COMPLETION OF A SEMESTER

Every student shall ordinarily be allowed to keep terms for the given semester in a program of his/ her enrolment, only if he/ she fulfills at least seventy five percent (75%) of the attendance taken as an average of the total number of lectures, practicals, tutorials, etc. wherein short and/or long excursions/field visits/study tours organized by the college and supervised by the faculty as envisaged in the syllabus

shall be credited to his/her attendance. Every student shall have a minimum of 75% as an overall attendance.

6. EXAMINATIONS

The end semester examinations shall normally be conducted after completing 90 working days for each semester. The maximum marks for each theory and practical course shall be 100 with the following breakup:

a) Mark distribution for Theory Courses

Continuous Internal Assessment (CIA) : 50 Marks

End Semester Exams (ESE) : 50 Marks

Total :100 Marks

i) Distribution of Internal Marks

S.No.	Particulars	Distribution of Marks
1	CIA I (2.5 Units) (On completion of 45th working day)	15
2	Model (All 5 Units) (On completion of 85th working day)	15
3	Assignment	05
4	Attendance	05
5	Library Usage	05
6	Skill Enhancement *	05
	Total	**50**

Assignment Rubric
(Maximum -20 marks converted to 5 marks)

Criteria	4 marks	3 Marks	2 Marks	1 MArk
Language	Excellent spelling and Grammar	Good spelling and Grammar	Reasonable spelling and Grammar	Bad spelling and Grammar
Style	Outstanding style beyond usual college level	Attains College level style	Approaches College level style	Elementary form with little or no variety in

				sentence structure
Referencing	Good use of wide range of reference sources	Moderate use of suitable reference materials	Shows signs of plagiarism & using sources without referencing	No reference material used
Development	Main points well developed with high quality and quantity support	Main points developed with quality and quantity supporting details	Main points are present with limited details and development	Main points lack detailed development
Critical thinking/Problem solving	Advanced attempt to interpret the process, content/ analyse and solve the problem	Proficient attempt to interpret the process, content/ analyse and solve the problem	Adequate attempt to interpret the process, content/ analyse and solve the problem	Limited attempt to interpret the process, content/ analyse and solve the problem

Breakup for Attendance Marks:

S.No	Attendance Range	Marks Awarded
1	95% and Above	5
2	90% - 94%	4
3	85% - 89%	3
4	80% - 84%	2
5	75% - 79%	1

Note:

Special Cases such as NCC, NSS, Sports, Advanced Learner Course, Summer Fellowship and Medical Conditions etc. the attendance exemption may be given by principal and Mark may be awarded.

Break up for Library Marks:

S.No	Attendance Range	Marks Awarded
1	10h and above	5
2	9h- less than 10h	4
3	8h - less than 9h	3
4	7h - less than 8h	2
5	6h - less than 7h	1

Note:
In exception, the utilization of e-resources of library will be considered.

***Components for "Skill Enhancement" may include the following:**

Class Participation, Case Studies Presentation, Field Study, Field Survey, Group Discussion, Term Paper, Presentation of Papers in Conferences, Industry Visit, Book Review, Journal Review, e-content Creation, Model Preparation & Seminar.

Components for Skill Enhancement

Any one of the following should be selected by the course coordinator

S.No.	Skill Enhancement	Description
1	Class Participation	• Engagement in class • Listening Skills • Behaviour
2	Case Study Presentation/ Term Paper	• Identification of the problem • Case Analysis • Effective Solution using creativity/imagination
3	Field Study	• Selection of Topic • Demonstration of Topic • Analysis & Conclusion
4	Field Survey	• Chosen Problem • Design and quality of survey • Analysis of survey
5	Group Discussion	• Communication skills • Subject knowledge • Attitude and way of presentation • Confidence • Listening Skill
6	Presentation of Papers in Conferences	• Sponsored • International/National • Presentation • Report Submission

7	Industry Visit	• Chosen Domain • Quality of the work • Analysis of the Report • Presentation
8	Book Review	• Content • Interpretation and Inferences of the text • Supporting Details • Presentation
9	Journal Review	• Analytical Thinking • Interpretation and Inferences • Exploring the perception if chosen genre • Presentation
10	e-content Creation	• Logo/ Tagline • Purpose • Content (Writing, designing and posting in Social Media) • Presentation
11	Model Preparation	• Theme/ Topic • Depth of background Knowledge • Creativity • Presentation
12	Seminar	• Knowledge and Content • Organization • Understanding • Presentation

ii) Distribution of External Marks

Total	**:**	**50**
Written Exam	**:**	**50**

Marks Distribution for Practical course

Total	**:**	**100**
Internal	**:**	**50**
External	**:**	**50**

i) Distribution of Internals Marks

S.No.	Particulars	Distribution of Marks
1	Experiments/Exercises	15
2	Test 1	15
3	Test 2	15
4	Observation Notebook	05
	Total	**50**

ii) Distribution of Externals Marks

S.No.	Particulars	External Marks
1	Materials and methods/ Procedures/Aim	10
2	Experiment/ Performance/ Observations/ Algorithm	10
3	Results/ Calculations/ Spotters/ Output	10
4	Inference/Discussion/ Presentation	10
5	Record	6
6	Viva- voce	4
	Total	**50**

A) Mark Distribution for Project/Internship/Industrial Training

Total : 100
Internal : 50
External : 50

i) Distribution of Internal Marks

S.No.	Particulars	Internal Marks
1	Review I	20
2	Review II	20
3	Attendance	10
	Total	**50**

ii) Distribution of External Marks

S.No	Particulars	External Marks
1	Project Work/Internship/ Industrial training presentation	40
2	Viva –voce	10
	Total	**50**

Evaluation of project Work/Internship/ Industrial training shall be done jointly by Internal and External Examiners

7. Credit Transfer

a. Upon successful completion of 1 NPTEL Course (4 Credit Course) recommended by the department, during Semester I to IV, a student shall be eligible to get exemption of one **4 credit course** during the V or VI semester. The proposed NPTEL course should cover content/syllabus of exempted core paper in V or VI semester.

S. No.	Course Code	Course Name	Proposed NPTEL Course	Credit
1			Option – 1 Paper title	4
			Option – 2 Paper title	
			Option – 3 Paper title	

b. Upon successful completion of **2 NPTEL Courses** (2 Credit each) recommended by the department, during Semester I to IV, a student shall be eligible to get exemption of **one 4 credit course** during the V or VI semester. Out of 2 NPTEL proposed courses, **atleast 1 course** should cover content/syllabus of exempted core paper in V or VI semester.

<u>Mandatory</u>

The exempted core paper in the V or VI semester should be submitted by the students for approval before the end of 4th semester.

Credit transfer will be decided by equivalence committee

S. No.	Course Code	Course Name	Proposed NPTEL Course	Credit
1			Option – 1 Paper title	2
			Option – 2 Paper title	
			Option – 3 Paper title	
2			Option – 1 Paper title	2
			Option – 2 Paper title	
			Option – 3 Paper title	

NPTEL Courses to be carried out during semester I – IV.

S.No.	Student Name	Class	Proposed NPTEL Course		Proposed Course for Exemption
			Course I	Option 1- Paper Title Option 2- Paper Title Option 3- Paper Title	Any one Core Paper in V or VI Semester
			Course II	Option 1- Paper Title Option 2- Paper Title Option 3- Paper Title	

Upon Successful outcome of Design Thinking / Copy right/Product/ Patent by the end of the V Semester, student shall be eligible to get exemption in AECC: Innovation, IPR & Entrepreneurship / Innovation & IPR offered during VI Semester.

9. Internship/Industrial Training

Students must undertake industrial / institutional training for a minimum of 15 days during the IV semester summer vacation. The students shall submit the report for evaluation during V semester.

10. Extra Credits: 10

Earning extra credit is not essential for programme completion. Student is entitled to earn extra credit for achievement in Co-Curricular/ Extracurricular activities carried out other than the regular class hours.

A student is permitted to earn a maximum of Ten extra Credits during the programme period. A maximum of 1 credit under each category is permissible.

Category	Credit
Proficiency in foreign language	1
Proficiency in Hindi	1
Self study Course	1
Typewriting/Short hand	1
CA/ICSI/CMA (Foundations)	1
CA/ICSI/CMA (Inter)	1
Sports and Games	1
Publications / Conference Presentations (Oral/Poster)/Awards	1
Lab on Project	1
Innovation / Incubation / Patent / Sponsored Projects / Consultancy/	1
Representation in State / National level celebrations	1
Awards/ Recognitions / fellowships	1

Credit shall be awarded for achievements of the student during the period of study only.

GUIDELINES

Proficiency in foreign language

A pass in any foreign language in the examination conducted by an authorized agency.

Proficiency in Hindi

A pass in the Hindi examination conducted by Dakshin Bharat Hindi Prachar Sabha.

Examination passed during the programme period only will be considered for extra credit.

Self study Course

A pass in the self study courses offered by the department.

The candidate should register the self study course offered by the department only in the III semester.

Typewriting/Short hand

A Pass in short hand /typewriting examination conducted by Tamil Nadu Department of Technical Education (TNDTE) and the credit will be awarded.

CA/ICSI/CMA(Foundations)

Qualifying foundation in CA/ICSI/CMA / etc.

Sports and Games

The Student can earn extra credit based on their Achievement in sports in University/ State / National/ International.

Publications / Conference Presentations (Oral/Poster)

Research Publications in Journals

Oral/Poster presentation in Conference

Lab on Project (LoP)

To promote the undergraduate research among all the students, the LoP is introduced beyond their regular class hours. LoP is introduced as group project consisting of not more than five members. It consist of four stages namely Literature collection, Identification of Research area, Execution of research and Reporting / Publication of research reports/ product developments. These four stages spread over from III to V semester.

(Evaluation will be done internally)

Innovation / Incubation / Patent / Sponsored Projects / Consultancy

Development of model/ Products /Prototype /Process/App/Registration of Patents/ Copyrights/Trademarks/Sponsored Projects /Consultancy

Representation in State/ National level celebrations

State / National level celebrations such as Independence day, Republic day Parade, National Integration camp etc.

Awards/ Recognitions/fellowships

Regional/ State / National level awards/ Recognitions/Fellowships

100 % CIA Courses :

- **AECC**
- **AEEC**

S.No	Type of Course
1	Environmental Studies (AECC)
2	Human Rights and Women's Rights, Basic Tamil / Advanced Tamil (AECC)
3	Innovation &IPR/ Innovation, IPR and Entrepreneurship(AECC)
4	Generic Elective (AEEC)

Modalities for Implementing Internal Assessment Marks:

- Student pertaining to 2022 Batch (2022-25) UG programme for the above mentioned courses shall secure a minimum of 40% out of the maximum marks in the continuous internal assessment (CIA) i.e., 20 marks out of 50 marks.
- Students who have not acquired the minimum marks shall be allowed to reappear to improve their marks in the exam components only within the time duration of the programme, in the forthcoming semesters.

Distribution of Internal Marks for AECC & AEEC (Theory)

S.No.	Particulars	Distribution of Marks
1	CIA I (2.5 Units) (On completion of 45th working day)	15
2	Model (All 5 Units) (On completion of 85th working day)	15
3	Assignment	05
4	Attendance	05
5	Library Usage	05
6	Skill Enhancement *	05
	Total	**50**

Distribution of Internal Marks for Generic Elective (AEEC) (Practical)

S.No.	Particulars	Distribution of Marks
1	CIA -I (1-5 Exercise)	5
2	CIA-II (6-10 Exercise)	5
3	Class Participation	10
4	Practical Record	10
5	Test-III & Viva –Voce(10+10)	20
	Total	**50**

Question paper pattern AECC & AEEC

Test	MARKS	DESCRIPTION	TOTAL	Remarks
CIA Test I **1 Hour** **First 2.5 Units**	50 x 1 = 50 Marks	MCQ	50 Marks	Marks secured will be Converted to 15 marks
CIA test II/ Model test **1 Hour** **All five Units**	50 x 1 = 50 Marks	MCQ	50 Marks	Marks secured will be Converted to 15 marks

Question paper pattern		Total Marks - 50	
Basic Tamil		**Advanced Tamil**	
Section -A		**Section -A**	
Choose the correct answer	10x2=20	**Choose the correct answer**	10x1=10
Section -B		**Section -B**	
True or false	10x2=20	**Fill in the blanks**	10x2=20
Section -C		**Section -C**	
Answer in one page	1x10=10	**Write an essay in two pages**	2x10=20

Question paper pattern for all other courses falling under Part I to Part III

CIA Test : [1 ½ Hours-2.5 Units] - 25 Marks

SECTION	MARKS	DESCRIPTION	TOTAL	Remarks
Section – A	8 x 0.5 = 04 Mark	MCQ	25 Marks	Marks secured will be converted to 15 marks
Section - B	3 x 3 = 09 Mark	Answer ALL Questions Either or Type ALL Questions Carry Equal Marks		
Section - C	2 x 6 = 12 Mark			

Model Test: [3 Hours-5 Units] - 50 Marks

SECTION	MARKS	DESCRIPTION	TOTAL	Remarks
Section – A	5 x 1 = 05 Marks	MCQ	50 Marks	Marks secured will be converted to 15 marks
Section - B	5 x 3 = 15 Marks	Answer ALL Questions (Either or Type Questions) Each Questions Carry Equal Marks		
Section - C	5 x 6 = 30 Marks			

End Semester Examination: [3 Hours-5 Units] - 50 Marks

SECTION	MARKS	DESCRIPTION	TOTAL
Section – A	5 x 1 = 05 Marks	MCQ	50 Marks
Section - B	5 x 3 = 15 Marks	Answer ALL Questions (Either or Type Questions) Each Questions Carry Equal Marks	
Section - C	5 x 6 = 30 Marks		

Course Code	Course Name	Category	L	T	P	Credit
221TL1A1TA	TAMIL- I : IKKALA ILAKKIYAM	LANGUAGE- I	4	1	-	03

PREAMBLE

This course has been designed for students to learn and understand

- மொழிப்பாடங்களின் வாயிலாக தமிழரின் பண்பாடு நாகரீகம், பகுத்தறிவு ஆகியவற்றை அறியச் செய்தல்
- கலை மற்றும் மரபுகளை அறியச் செய்தல்
- மாணவர்களின் படைப்பாக்கத்திறன்களை ஊக்குவித்தல்

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	வாழ்க்கைத் திறன்கள் (Life Skills)- மாணவர்களின் செயலாக்கத் திறனை ஊக்குவித்தல்	K3
CO2	மதிப்புக்கல்வி (Attitude and Value education)	K4
CO3	பாட இணைச்செயல்பாடுகள் (Co-curricular activities)	K4
CO4	சூழலியல் ஆக்கம் (Ecology)	K4
CO5	மொழி அறிவு (Tamil knowledge)	K5

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓			
CO2		✓			
CO3		✓			
CO4		✓			
CO5		✓			

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

221TL1A1TA	TAMIL- I: IKKALA ILAKKIYAM	SEMESTER I

Total Credits: 3

Total Instruction Hours: 60 h

Syllabus

Unit I **மறுமலர்ச்சிக் கவிதைகள்** 13 h

1. இலக்கிய வரலாறு - மறுமலர்ச்சிக் கவிஞர்களின் தமிழ்ப்பணிகள்
2. பாரததேசம் - பாரதியார்
3. படி - பாரதிதாசன்
4. தமிழரின் பெருமை - நாமக்கல் கவிஞர்
5. தமிழ்க் கொலை புரியாதீர் - புலவர் குழந்தை
6. திரைத்தமிழ்

அ) 'விஞ்ஞானத்த வளர்க்கப் போறண்டி' எனத் தொடங்கும் பாடல் - உடுமலை நாராயண கவி

ஆ) 'சும்மா கிடந்த நிலத்தை' எனத் தொடங்கும் பாடல் - பட்டுக்கோட்டை கல்யாண சுந்தரனார்

இ) 'சமரசம் உலாவும் இடமே' எனத் தொடங்கும் பாடல் - மருதகாசி

ஈ) 'உன்னை அறிந்தால்' எனத் தொடங்கும் பாடல் - கண்ணதாசன்

Unit II **புதுக்கவிதைகள்** 13 h

1. இலக்கிய வரலாறு - புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும்
2. கடமையைச் செய் - மீரா
3. மலையாளக் காற்று - சிற்பி
4. ஒப்பிலாத சமுதாயம் - அப்துல் ரகுமான்
5. கன்னிமாடம் - மு.மேத்தா
6. கரிக்கிறது தாய்ப்பால் - ஆரூர் தமிழ்நாடன்
7. ஐந்தாம் வகுப்பு 'அ' பிரிவு - நா. முத்துக்குமார்
8. ஹைகூ கவிதைகள் - 10 கவிதைகள்

Unit III **பெண்ணியம்** 09 h

1. தொலைந்து போனேன் - தாமரை

2. நீரில் அலையும் முகம் - அ. வெண்ணிலா

3. தற்காத்தல் - பொன்மணி வைரமுத்து

4. ஏனிந்த வித்தியாசங்கள் ? - மல்லிகா

5. புதையுண்ட வாழ்க்கை - சுகந்தி சுப்ரமணியன்

Unit IV சிறுகதைகள் 15 h

1. இலக்கிய வரலாறு - சிறுகதையின் தோற்றமும் வளர்ச்சியும்

2. கனகாம்பரம் - கு.ப.ராஜகோபாலன்

3. ஆற்றங்கரைப் பிள்ளையார் - புதுமைப்பித்தன்

4. பொம்மை - ஜெயகாந்தன்

5. காய்ச்சமரம் - கி. ராஜநாராயணன்

6. காட்டில் ஒருமான் - அம்பை

7. வேட்கை - சூர்யகாந்தன்

Unit V பயிற்சிப் பகுதி 10 h

அ. இலக்கணம்

1. வல்லின ஒற்று மிகும், மிகா இடங்கள் - ஒற்றுப்பிழை நீக்கி எழுதுதல்

2. ர,ற - ல,ழ,ள - ண,ந,ன வேறுபாடு - ஒலிப்பு நெறி, சொற்பொருள் வேறுபாடு அறிதல்)

ஆ. படைப்பாக்கம்

1. கவிதை - எழுதுதல் (15 வரிகள் முதல் 30 வரிகள் வரை)

2.சிறுகதை - எழுதுதல் (குறைந்தது 3 பக்கங்கள்)

Text Book

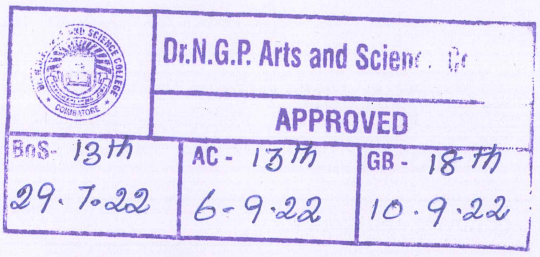
1 தமிழ் மொழிப்பாடம் - 2022-2023, தொகுப்பு: தமிழ்த்துறை, டாக்டர் என்.ஜி.பி. கலை அறிவியல் கல்லூரி, கோயம்புத்தூர் – 641048, வெளியீடு: நியூ செஞ்சுரி புக் ஹவுஸ், சென்னை – 600 098.

References

1 பேராசிரியர் புலவர் சோம. இளவரசு, எட்டாம் பதிப்பு - 2014, தமிழ் இலக்கிய வரலாறு – மணிவாசகர் பதிப்பகம், சென்னை – 600 108.

2 பேராசிரியர் முனைவர் பாக்கியமேரி, முதற் பதிப்பு - 2013, இலக்கணம் - இலக்கிய வரலாறு - மொழித்திறன் - பூவேந்தன் பதிப்பகம், சென்னை-600 004.

3 இணையதள முகவரி: https://www.tamilvu.org



Course Code	Course Name	Category	L	T	P	Credit
221TL1A1HA	HINDI- I: MODERN LITERATURE	LANGUAGE-I	4	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature
- The techniques for expansion of ideas and translation process

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the fundamentals of novels and stories	K1
CO2	Understand the principles of translation work	K2
CO3	Apply the knowledge writing critical views on fiction	K3
CO4	Build creative ability	K3
CO5	Expose the power of creative reading	K2

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓			
CO2		✓			
CO3		✓			
CO4		✓			
CO5		✓			

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

221TL1A1HA	HINDI- I: MODERN LITERATURE	SEMESTER I

Total Credits: 3

Total Instruction Hours: 60 h

Syllabus

Unit I 13 h

गद्य - नूतन गद्य संग्रह (जय प्रकाश)पाठ 1- रजियापाठ 2- मक्रीलपाठ 3- बहता पानी निर्मला पाठ 4- राष्ट्रपिता महात्मा गाँधी

Unit II 13 h

कहानी कुंज- डॉ वी.पी. 'अमिताभ'(पाठ 1-4)

Unit III 12 h

व्याकरण : शब्द विचार (संज्ञा, सर्वनाम,विशेषण)

Unit IV 12 h

अनुच्छेद लेखन

Unit V 10 h

अनुवाद अभ्यास-III (केवल अंग्रेजी से हिन्दी में) (पाठ 1 to 10)

Text Books

1. प्रकाशक: सुमित्र प्रकाशन 204 लीला अपार्ट्मेंट्स, 15 हेस्टिंग्स रोड'अशोक नगर इलाहाबाद-211001
2. प्रकाशक: गोविन्द प्रकाशनसदर बाजार, मथुरा उत्तरप्रदेश-281001
3. पुस्तक: व्याकरण प्रदिप – रामदेवप्रकाशक: हिन्दी भवन 36 टेगोर नगर इलाहाबाद-211024
4. पुस्तक: व्याकरण प्रदिप – रामदेवप्रकाशक: हिन्दी भवन 36 इलाहाबाद-211024
5. प्रकाशक: दक्षिण भारत प्रचार सभा चेनैई -17

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APPROVED

BoS- 13th	AC - 13th	GB - 18th
29.7.22	6.9.22	10.9.22

Course Code	Course Name	Category	L	T	P	Credit
221TL1A1MA	MALAYALAM- I: MODERN LITERATURE	LANGUAGE-I	4	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature, to learn the techniques for expansion of ideas and translation process
- the competency in translating simple Malayalam sentences into English and vice versa

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the fundamentals of novels and stories.	K1
CO2	Understand the principles of translation work.	K2
CO3	Apply the knowledge writing critical views on fiction.	K3
CO4	Build creative ability.	K3
CO5	Expose the power of creative reading	K2

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓			
CO2		✓			
CO3		✓			
CO4		✓			
CO5		✓			

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

221TL1A1MA	MALAYALAM- I: MODERN LITERATURE	SEMESTER I

Total Credits: 3

Total Instruction Hours: 60 h

Syllabus

Unit I **Novel** 14 h

Pathummayude Adu

Unit II **Novel** 10 h

Pathummayude Adu

Unit III **Short Story** 14 h

Nalinakanthi

Unit IV **Short Story** 10 h

Nalinakanthi

Unit V **Practical Application** 12 h

Expansion of ideas, General Essay and Translation

Text Books

1. Vaikkam Muhammed Basheer, "Pathummayude Adu" (NOVEL), DC Books & Kottayam
2. T.Padmanabhan, "Nalinakanthi" (Short Story), DC Books & Kottayam.

References

1. Malayala Novel Sahithyam.
2. Malayala Cherukatha Innale Innu.

Dr.N.G.P. Arts and Science Co
APPROVED
BOS - 18th 29.7.22 | AC - 18th 6.9.22 | GB - 18th 10.9.22

Course Code	Course Name	Category	L	T	P	Credit
221TL1A1FA	FRENCH- I: GRAMMAR, TRANSLATION AND CIVILIZATION	LANGUAGE - I	4	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- the Competence in General Communication Skills – Oral + Written – Comprehension & Expression
- the Culture, life style and the civilization aspects of the French people as well as of France
- the students to acquire Competency in translating simple French sentences into English and vice versa

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the Basic verbs, numbers and accents	K1
CO2	Apply the adjectives and the classroom environment in France	K2
CO3	Evaluate the Plural, Articles and the Hobbies	K3
CO4	Measure the Cultural Activity in France	K3
CO5	Select the sentiments, life style of the French people and the usage of the conditional tense	K2

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓			
CO2		✓			
CO3		✓			
CO4		✓			
CO5		✓			

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights		Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

221TL1A1FA	FRENCH- I: GRAMMAR, TRANSLATION AND CIVILIZATION	SEMESTER I

Total Credits: 3
Total Instruction Hours: 60 h

Syllabus

Unit I Salut I Page 10 — 12 h

Objectifs de Communication	Tâche	Activités de réception et de production orale
• Saluer • Enter en contact • avec quelqu'un. • Se presenter. • S'excuser	En cours de cuisine, premiers contacts avec les members d'un groupe	• Comprendre des personnes qui se saluent. • Ēchanger pour entrer en contact, se présenter, saluer, s'excuser. • Communiquer avec *tu* ou *vous*. • Comprendre les consignes de classe • Ēpeler son nom et son prénom. Computer jusqu'à 10.

Unit II Enchanté I Page 20 — 12 h

Objectifs de Communication	Tâche	Activités de réception et de production orale
• Demander de se presenter. • Présenter quelqu'un.	Dans la classe de français, se presenter et remplir une fiche pour le professeur.	• Comprendre les informations essentielles dans un échange en milieu professionnel. • Ēchanger pour se presenter et présenter quelqu'un.

Unit III J'adore I Page 30 — 12 h

Objectifs de Communication	Tâche	Activités de réception et de production orale
• Exprimer ses gouts.	Dans un café, participer à une soirée de rencontres rapides et remplir de taches d'appréciation.	• Dans une soirée de recontres rapid comprendre des personnes qui échangent sur elles et sur leurs goût • Comprendre une personne qui parler des goûts de quelqu'un d'autre.

Unit IV J'adore I Page 30 14 h

Objectifs de Communication	Tâche	Activités de réception et de production orale
• Présenter quelqu'un	Dans un café, participer à une soirée de rencontres rapides et remplir de taches d'appréciation	• Exprimer ses goûts. • Comprendre une demande laissée sur un répondeur téléphonique. • Parler de ses projets de week-end.
Autoévaluation du module I Page 40 – Préparation au DELF A1 page 42		
Demander à quelqu'un de faire quelque chose. Demander poliment. Parler d'actions passes. Tu veux bien?	Organiser un programme d'activités pour accueillir une personne importante.	Comprendre une personne demande un service à quelqu'un. Demander à quelqu'un de faire quelque chose. Imaginer et raconter au passé à partir de situations dessinées.

Unit V Practical Application 10 h

Make in Own Sentences

Text Book

1 Regine Merieux, Yves Loiseau, "LATITUDES - 1" (Page No: 9-55) (Methode de Français), Goyal Publisher & Distributors Pvt.Ltd., 86 UB Jawahar Nagar (Kamala Nagar), Delhi-7 Les Editions Dider, Paris, 2008- Imprime en Roumanie par Canale en Janvier 2012.

Course Code	Course Name	Category	L	T	P	Credit
221EL1A1EA	PROFESSIONAL ENGLISH- I	LANGUAGE- II	4	-	1	3

PREAMBLE

This course has been designed for students to learn and understand

- the effect of dialogue, the brilliance of imagery and the magnificence of varied genres
- any spontaneous spoken discourse and respond to them with proper sentence structure
- the transactional concept of English language

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Identify the various aspects in poetry	K2
CO2	Infer linguistic and non-linguistic features of the context for understanding and interpreting	K3
CO3	Construct sentences and convey messages effectively in real life situations	K3
CO4	Apply different reading strategies with varying speed	K3
CO5	Prepare modules with their own ideas and present them coherently in a grammatically correct form	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓			
CO2		✓			
CO3		✓			
CO4		✓			
CO5		✓			

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

221EL1A1EA	PROFESSIONAL ENGLISH- I	SEMESTER I

Total Credits: 3

Total Instruction Hours: 60 h

Syllabus

Unit I Genre Studies 10 h

Nissim Ezekiel: The Worm- Author's Biography- title indications- outline- paraphrasing the poem- context of poem- form- poetic devices- enjambment- techniques– Annotations

Niyi Osundare: Our Earth Will Not Die- Author's Biography- title indications- outline- paraphrasing the poem- context of poem- form- poetic devices- enjambment- techniques– Annotations

A. G. Gardiner: On Superstitions- Author's biography- Narrative structure- Exploration of the text- passage analysis- insight of ideas- cohesion and context- style- language techniques- Annotations

Nancy Bella: Clever Thief- Author's Biography- Plot Summary- Detailed summary and Analysis- Themes- Important Quotations- Characters- Description - analysis- Terms- Symbols- Critical analysis

H. G. Wells: The Truth about Pyecraft- Author's Biography-narrative structure- passage analysis- insight of ideas- cohesion and context- style- language techniques

Unit II Listening Skills 12 h

Listening vs. hearing- Types of listening, Tips to enhance Listening Skills, Non-verbal and Verbal signs of active listening - Comprehensive Listening - Listening to pre-recorded audios on speeches, interviews and conversations - Listening Activities- Listening and responding to complaints (formal situation), Listening to problems and offering solutions (informal)

Unit III Speaking Skills 14 h

Formal occasions- Introducing oneself, Introducing others, Enquiries and Seeking permission, Making short presentations - Informal occasions- Requests, Offering help, Congratulating, Farewell party, graduation speech -Giving instructions to do a task and to use a device, Giving and asking directions

Unit IV Reading Skills 10 h

Study Skills: Skimming and Scanning- Reading different kinds of texts- Types of reading-Developing a good reading speed, reading aloud, Referencing skill - Word Power (Denotation and Connotation) - Reading comprehension, Data interpretation –Charts, Graphs, Advertisements

Unit V Writing Skills 12 h

Sentence patterns, Note- making and note taking-Strategies - Paragraph writing: Structure and Principles - Academic Writing - Formal and Informal Letters, Report, Book /Movie Review

Text Books

1 Gardiner, A. G. 1926. Alpha of the Plough: Second series, J.M. Dent & Sons Ltd., London, United Kingdom. pg.no-151-156. (Unit I)

2 Ezekiel, Nissim. "The Worm," Crazy Romantic Love, www. mianmawaisarain.live/2020/05/poem-worm-nissim-ezekiel.html. Accessed 3 Aug. 2022. (Unit I)

3 < http://livros01.livrosgratis.com.br/ln000835.pdf /> (Unit I)

4 Mithra, S. M. 1919. Hindu Tales from the Sanskrit, Macmillan & Co Ltd., London, United Kingdom. pg.no-127-142. (Unit I)

5 Nation, I. S. P and Jonathan Newton. 2009. Teaching ESL/EFL Listening and Speaking. Routledge, New York, United States. (Unit II)

6 Prabha, Dr. R. Vithya & S. Nithya Devi. 2019. Sparkle. (1st Edn.) McGraw - Hill Education, Chennai, India. (Unit III– V)

References

1. Our Earth Will Not Die By Niyi Osundare." Studocu.Com, studocu.com/in/document/bangalore-university/bachelor-of-computer-applications/1586771577-our-earth-will-not-die/27675462. Accessed 3 Aug. 2022.

2. OnSuperstitions."THEHISTORIAN,thehistorian1947.wordpress.com/2019/03/08/on-superstitions-by-a-g-gardiner. Accessed 3 Aug. 2022.

3. Swales, John M. & Feak, Christine B. 2012. Academic Writing for Graduate Students: Essential Tasks and Skills, University of Michigan Press, Michigan.

4. Rudzka, Brygida -Ostyn, 2003. Word Power: Phrasal Verbs and Compounds: A Cognitive Approach, Mouton de Gruyter, New York, United States.

Course Code	Course Name	Category	L	T	P	Credit
224AI1A1CA	PROBLEM SOLVING AND PROGRAMMING IN C	CORE	4	1	-	4

PREAMBLE

This course has been designed for students to learn and understand

- The fundamental aspects of programming and problem solving
- The C language fundamentals
- The representation and working of arrays, pointers, functions and files

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Illustrate the basic principles of programming and problem solving	K2
CO2	Understand the fundamentals of C Language	K2
CO3	Implement decision making using branching and looping.	K3
CO4	Develop programs using arrays and functions	K3
CO5	Execute programs using pointers, structures and files	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓			✓	✓
CO2	✓			✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓

✓	Skill Development		Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

224AI1A1CA	PROBLEM SOLVING AND PROGRAMMING IN C	SEMESTER I

Total Credits: 4

Total Instruction Hours: 60 h

Syllabus

Unit I Introduction to Programming and Problem Solving 12 h

Introduction: Types of Programming Languages – High level Languages – Assembly Languages – Machine Level Languages – System Software – Operating Systems – Compiler – Linker and Interpreter. Problem Solving Strategies: Steps involved in problem solving - Algorithms - Flow Charts - Symbols used in Flow Charts - Pseudo Codes – Structured Programming - Sequence – Selection – Repetition – Modular Programming.

Unit II C Language Fundamentals 12 h

Language Fundamentals: Introduction to C - Basic Structure of C Program – Constants – Variables – Data Types - Operators – Expressions – Evaluation of Expressions - Operator Precedence and Associativity - Managing the Input and Output – Formatted I/O – Unformatted I/O – Storage classes- Simple programs for logic building.

Unit III Decision Making and Arrays 12 h

Branching: Simple if Statement – if-else statement – elseif Ladder – Switch statement – goto, break and continue statements. Looping: while loop – do-while loop -for loop- nested for loop – Pre-processor Directives: Macro substitution – File inclusion – Compiler control directives. Arrays: Introduction – Types of arrays – Declaration and Initialization of Arrays – Dynamic Arrays.

Unit IV Strings, Functions and Pointers 12 h

Strings: Declaring and Initializing the string variables – String handling functions. Functions – Need for functions – Elements of functions – Category of functions – Passing arrays to functions - Recursion. Pointers: Understanding Pointers – Declaration and Initialization of pointer variables – Accessing variables through pointers – Pointers and arrays.

Unit V Structures and Files 12 h

Structures: Defining a structure – Declaring structure variables – Accessing structure member – Array of structures - Structure within structures -Unions. Files: Defining and opening a File – Closing a file – I/O Operations on files - Dynamic memory allocation - Command Line Arguments.

Text Books

1 Ashok N. Kamthane, 2009, "Programming and Data Structures", 1st Edition, Pearson Education.

2 Byron Gottfried, 2018, "Schaum's Outline of Programming with C", 4th Edition, McGraw Hill Education.

References

1 E.Balagurusamy, 2017, "Programming in ANSI C", 7th Edition, TMH.

2 H. Schildt, 2000, "C: The Complete Reference", 4th Edition, TMH.

3 ReemaThareja , 2015, "Programming in C", 2nd Edition, Oxford University Press.

4 Anita Goel, Ajay Mittal, 2016,"Computer Fundamentals and Programming in C", 1st Edition, Pearson.

224CA1A1CP	CORE PRACTICAL: C PROGRAMMING	SEMESTER I

Total Credits: 2
Total Instructions Hours: 48 h

S.No	Contents
1	Program using Operators
2	Program to illustrate I/O Statements
3	Program to perform Conditional Statements
4	Program to demonstrate Looping Statements
5	Program to demonstrate String Handling Functions
6	Program to perform Dynamic Arrays
7	Program to perform Recursion
8	Program to implement Structure
9	Program to demonstrate Storage classes & Pre-processor Directives
10	Program to demonstrate Dynamic Memory Allocation
11	Program to implement Files
12	Program to illustrate Command Line Arguments

Note: Out of 12 – 10 Mandatory

Dr.N.G.P. Arts and Science Co...		
APPROVED		
BoS- 13th	AC - 13th	GB - 18th
29.7.22	6.9.22	10.9.22

Course Code	Course Name	Category	L	T	P	Credit
224IT1A1CA	DIGITAL COMPUTER FUNDAMENTALS	CORE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- The concepts of number system and circuits
- The principles of logic gates and memory
- The design and architecture of microprocessors and microcontrollers

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the types of number systems, Boolean Algebra	K2
CO2	Understand and analyze Logic gates	K2
CO3	Illustrate the concepts of combinational circuits	K3
CO4	Understand the different types of sequential logic and memory organization	K2
CO5	Understand the architecture of microprocessors and microcontrollers	K2

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓		✓	✓	
CO2	✓			✓	
CO3	✓	✓	✓	✓	✓
CO4	✓		✓	✓	
CO5	✓		✓	✓	

✓	Skill Development		Entrepreneurial Development
	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

224IT1A1CA	DIGITAL COMPUTER FUNDAMENTALS	SEMESTER I

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Binary Systems and Boolean Algebra 10 h

Binary Numbers- Number base conversions- Octal and Hexadecimal conversions- Complements- Binary codes - Decimal codes.

Basic Definitions-Boolean functions- Canonical standard forms: Minterms and Maxterms - Sum of Minterms-Product of Maxterms-conversion between canonical forms.

Unit II Logic Gates and Boolean functions 8 h

Digital Logic Gates: AND, OR, Inverter, Buffer, NAND, NOT, Exclusive-OR, Exclusive-NOR.

The Map method-Two and three-variable Maps-Four variable Map - Five and Six-Variable Maps- Product of Sum simplification - Don't care conditions.

Unit III Combinational Logic 10 h

Adders: Half-Adder, Full-Adder. Subtractors Half-Subtractor, Full-Subtractor. Multilevel NAND Circuits: Universal Gate. Multilevel NOR Circuits: Universal Gate. Binary Parallel Adder- Decimal Adder - BCD Adder. Decoders: Demultiplexers- Encoders - Multiplexer.

Unit IV Sequential Logic & Memory Unit 10 h

Introduction- Flip-flops-Clocked RS Flip-flop - D Flip-flop - JK Flip-flop - Design of Counters- Registers -Ripple Counters.

The Memory Unit - Random Access Memories: Integrated-circuit Memory- Magnetic-core Memory.

Unit V Introduction to Microprocessors and Microcontrollers 10 h

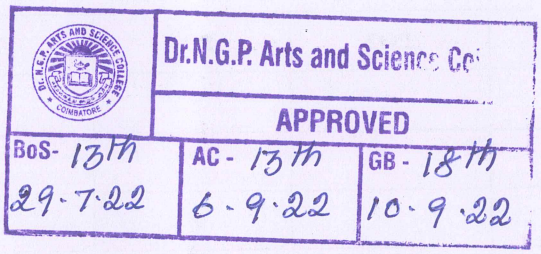
Introduction – Microprocessor- Microcomputer- Architecture of Microprocessors- History- Evolution- Microprocessor Applications- Evolution of Microcontrollers- Application of Microcontrollers. Architecture of 8085 Microprocessor- Pin diagram of 8085 Microprocessor.

Text Books

1. M.Morris Mano, 2019, "Digital Logic and Computer Design", Pearson India Education.
2. Soumitra Kumar Mandal, 2018, "Microprocessors and Microcontrollers – Architecture, Programming and Interfacing using 8085, 8086, 8051", 15th Edition, Tata Mc Graw Hill Education.

References

1. S. Salivahanan and S Arivazhagan, 2018, "Digital Circuits and Design", 5th Edition, Oxford University Press, Noida
2. Thomas Floyd L., 2015, "Digital Fundamentals", 11th Edition, Pearson Publication Ltd, New Delhi
3. M Morris Mano, 2016, " Digital Logic and Computer Design", 5th edition, Pearson
4. Aditya P Mathur, 2016, "Introduction to Microprocessor", 3rd Edition, McGraw Hill Education.



Course Code	Course Name	Category	L	T	P	Credit
222MT1A1IC	NUMERICAL METHODS AND STATISTICS	IDC	4	1	-	4

PREAMBLE

This course has been designed for students to learn and understand

- the method of solving linear system of equations
- the relation between two attributes and measure their efficiency
- the method of checking the validity of parameters through test statistic

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Recognize the direct and indirect methods for solving algebraic equations	K1
CO2	Discuss the method of solving differential and integral problems	K2
CO3	Define the parameters of central tendencies and dispersion.	K1
CO4	Demonstrate the applications of correlation and regression	K2
CO5	Analyze the validity of the values of parameters through hypothesis testing.	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓		
CO2	✓		✓	✓	
CO3	✓		✓	✓	
CO4			✓	✓	✓
CO5	✓		✓	✓	✓

✓	Skill Development		Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

222MT1A1IC	NUMERICAL METHODS AND STATISTICS	SEMESTER I

Total Credits: 4

Total Instruction Hours: 60 h

Syllabus

Unit I Solution of Algebraic, Transcendental and Linear systems of Equations 13 h

Introduction - Newton-Raphson method-Direct methods -Matrix inversion method - Gaussian elimination method - Gauss Jordan method - Iterative methods - Gauss Seidel Method - Gauss Jacobi method

Unit II Interpolation, Numerical Differentiation and Integration 12 h

Introduction - Finite differences - Newton's formulae for interpolation – Interpolation with unevenly spaced points: Lagrange's interpolation formula- Numerical differentiation - maximum and minimum values of a tabulated Function - Numerical integration - Trapezoidal rule - Simpson's 1/3 Rule - Simpson's 3/8 Rule.

Unit III Classification, Measures of Central tendency and Dispersion 13 h

Frequency distribution - Characteristics of a good measure of central tendency - Mean - Arithmetic Mean - pooled mean - Geometric Mean - Harmonic Mean - Median - Mode.

Measures of Dispersion - purposes - properties -Range - Inter quartile range –Mean deviation - Variance - Standard Deviation - coefficient of variation.

Unit IV Correlation and Regression 11 h

Scatter diagram - Least square method of fitting a regression line - properties - regression line of X on Y- Correlation methods - determination of correlation by graphical method -Correlation Coefficient - Correlation in grouped bivariate data - relationship between correlation coefficients and regression coefficient - Rank correlation.

Unit V Test of Significance and Chi-square Test 11 h

Test of hypothesis for population variance -two types of error - level of significance - critical region - one and two tailed test - size and power of a test -randomized test -non randomized test - degrees of freedom - student's t- test - test of equality of two population means - paired t- test

Chi-square Test: test of hypothesis for population variance - test of goodness of fit - test in one way classification - Contingency table - Test of independence of factors - Yate's correction.

Note: 20% Theory and 80% Problem

Text Books

1 Sastry, S.S ,(2012) Introductory methods of Numerical Analysis. New Delhi: Prentice-Hall of India. (Unit I to II)

2 Agarwal B. L , (2013) Basic Statistics ,New age International (P) Limited publishers, New Delhi.(Unit III to V)

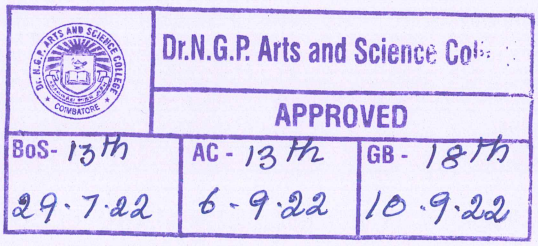
References

1 Gupta. C.B. and Vijay Gupta, 2007, "Introduction to Statistical Methods", S.Chand & Co, New Delhi

2 Sanchetti. D.C. Kappor, V.K. 2010, "Statistic", S.Chand & Co , New Delhi

3 Venkataraman,M.K. 2004, "Numerical Methods in Science and Engineering", 4th Edition, NPC.

4 Veerarajan.T, Ramachandran.T, 2004. "Theory and Problems in Numerical Methods With Programs in C and C++", 10th Edition, Tata Mc- Graw Hill Publishing Company Limited, New Delhi .



Course Code	Course Name	Category	L	T	P	Credit
223MB1A1AA	ENVIRONMENTAL STUDIES	AECC	2	-	-	2

PREAMBLE

This course has been designed for students to learn and understand

- Multi disciplinary aspects of Environmental studies
- Importance to conserve the Biodiversity
- Causes of Pollution and its control

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the importance of natural resources in order to conserve for the future.	K2
CO2	Infer on Natural resources and its conservation	K2
CO3	Apply the knowledge on Biodiversity and its conservation	K3
CO4	Relate effects, causes and control of air, water, soil and noise pollution etc.,	K2
CO5	Build awareness about sustainable development and Environmental protection	K2

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓			
CO2		✓			
CO3		✓			
CO4		✓			
CO5		✓			

✓	Skill Development		Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

223MB1A1AA	ENVIRONMENTAL STUDIES	SEMESTER I

Total Credits: 2

Total Instruction Hours: 24 h

Syllabus

Unit I Introduction to Environmental studies & Ecosystems 5 h

Introduction to Environmental studies& Ecosystems: Multidisciplinary nature of environmental studies; components of environment – atmosphere, hydrosphere, lithosphere and biosphere. Scope and importance; Concept of sustainability and sustainable development. Ecosystem- Structure and function of ecosystem; Energy flow in an ecosystem: food chain, food web and ecological succession.

Unit II Natural Resources: Renewable and Non-renewable Resources 5 h

Natural Resources: Renewable and Non-renewable Resources: Land Resources and land use change; Land degradation, soil erosion and desertification. Deforestation: Causes and impacts due to mining, dam building on environment, forests, biodiversity and tribal populations. Water: Use and overexploitation of surface and ground water, floods, droughts, conflicts over water (international & inter-state). Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs.

Unit III Biodiversity and Conservation 5 h

Biodiversity and Conservation: Levels of biological diversity: genetic, species and ecosystem diversity; Biogeography zones of India; Biodiversity patterns and global biodiversity hot spots. India as a mega-biodiversity nation; Endangered and endemic species of India. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions; Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.

Unit IV Environmental Pollution, Environmental Policies & Practices 5 h

Environmental Pollution, Environmental Policies & Practices: Environmental pollution: types, causes, effects and controls; Air, water, soil, chemical and noise pollution. Nuclear hazards and human health risks. Solid waste management: Control measures of urban and industrial waste. Pollution case studies. Climate change, global warming, ozone layer depletion, acid rain and impacts on human communities and agriculture. Environment Laws: Environment Protection Act; Prevention & Control of Pollution Act – Air & Water. Wildlife Protection Act; Forest Conservation Act;

Unit V Human Communities and the Environment& Field Work 4 h

Human Communities and the Environment & Field Work: Human population and growth: Impacts on environment, human health and welfares. Environmental ethics: Role of Indian and other religions and cultures in environmental conservation. Environmental communication and public awareness. Visit to an area to document environmental assets; river/forest/flora/fauna, etc. Population explosion – Family Welfare Programmes. Role of Information Technology in Environment and human health. Role of the Colleges, Teachers and Students in village adoption towards clean, green and make in villages in various aspects.

Text Books

1 Carson, R. 2002. Silent Spring. Houghton Mifflin Harcourt.

2 Gadgil, M., & Guha, R.1993. This Fissured Land: An Ecological History of India. Univ. of California Press.

References

1 Gleeson, B. and Low, N. (eds.) 1999. Global Ethics and Environment, London, Routledge

2 Gleick, P.H. 1993. Water in Crisis. Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press

3 Groom, Martha J. Gary K. Meffe, and Carl Ronald carroll. Principles of Conservation Biology. Sunderland: Sinauer Associates, 2006

4 Grumbine, R. Edward, and Pandit, M.K. 2013. Threats from India's Himalaya dams. Science, 339: 36-37.

5 McCully, P.1996. Rivers no more: the environmental effects of dams (pp. 29-64). Zed Books

6 McNeil, John R. 2000. Something New Under the Sun: An Environmental History of the Twentieth Century

7 Odum, E.P., Odum, h.T. & Andrews, J.1971. Fundamentals of Ecology. Philadelphia: Saunders.

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BoS- 13th	AC - 13th	GB - 18th
29.7.22	6.9.22	10.9.22

Academic Council
Dr.V. Rajendran
CHAIRMAN
Dr.N.G.P. Arts and Science College

Course Code	Course Name	Category	L	T	P	Credit
221TL1A2TA	TAMIL - II: ARA ILAKKIYAM	LANGUAGE- I	4	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- மொழிப்பாடங்களின் வாயிலாக தமிழரின் பண்பாடுநாகரீகம்,பகுத்தறிவு ஆகியவற்றை அறியச் செய்தல்
- கலை மற்றும் மரபுகளை அறியச் செய்தல்
- மாணவர்களின் படைப்பாக்கத்திறன்களை ஊக்குவித்தல்

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	வாழ்க்கைத்திறன்கள் (Life Skills) - மாணவர்களின் செயலாக்கத்திறனை ஊக்குவித்தல்	K1
CO2	மதிப்புக்கல்வி (Attitude and Value education)	K2
CO3	பாடஇணைச்செயல்பாடுகள் (Co-curricular activities)	K2
CO4	சூழலியல் ஆக்கம் (Ecology)	K3
CO5	மொழி அறிவு (Tamil knowledge)	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓			✓
CO2		✓			✓
CO3		✓			✓
CO4		✓			✓
CO5		✓			✓

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

221TL1A2TA	TAMIL - II: ARA ILAKKIYAM	SEMESTER II

Total Credits: 3

Total Instruction Hours: 60 h

Syllabus

Unit I அற இலக்கியம் 13 h

1. இலக்கிய வரலாறு- பதிணென்கீழ்க்கணக்குநூல்கள்

2.திருக்குறள்

அ. அறன்வலியுறுத்தல்- அ. எண் 04

ஆ. நட்பாராய்தல் - அ. எண் 80

இ. நாடு- அ. எண் 74

ஈ. குறிப்பறிதல்- அ. எண் 110

Unit II அற இலக்கியம் 13 h

1. நாலடியார் - அறிவுடைமை

2. மூதுரை - ஔவையார் - 10 பாடல்கள்-6,7,9,10,14,16,17,23,26,30

3. இனியவைநாற்பது- பூதஞ்சேந்தனார் - முதல் 10 பாடல்கள்

Unit III அறநெறிக் கட்டுரைகள் 09 h

1. இலக்கியவரலாறு - தமிழ் உரைநடையின் தோற்றமும் வளர்ச்சியும்

2. கலைகள்-உ.வே.சா

3. சங்க நெறிகள்- வ.சுப.மாணிக்கம்

Unit IV அறநெறிக் கட்டுரைகள் 15 h

1. வீர வணக்கம் - க.கைலாசபதி

2. தமிழர் பண்பாடு - டாக்டர் சோ.நா.கந்தசாமி

3. இணையத் தமிழ் வளர்ச்சி - முனைவர் ப.அர.நக்கீரன்

Unit V பயிற்சிப் பகுதி 10 h

1.இலக்கணம்-வழு, வழுவமைதி,வழாநிலை

2.அலுவலகம் சார்ந்த கடிதம் -விண்ணப்பங்கள், வேண்டுகோள்,முறையீடு

3.படைப்பாக்கம்-பொதுத்தலைப்பில் கட்டுரைகள் எழுதுதல்

Text Book

1 தமிழ் மொழிப்பாடம்-2022-2023,தொகுப்பு: தமிழ்த்துறை, டாக்டர் என்.ஜி.பி. கலை அறிவியல் கல்லூரி,கோயம்புத்தூர். வெளியீடு: நியூ செஞ்சுரி புக் ஹவுஸ்,சென்னை. (Unit I to V)

References

1 பேராசிரியர் புலவர் சோம. இளவரசு,எட்டாம் பதிப்பு-2014,தமிழ் இலக்கிய வரலாறு- மணிவாசகர் பதிப்பகம்,சென்னை.

2 பேராசிரியர் முனைவர் பாக்கியமேரி,முதற் பதிப்பு- 2013,இலக்கணம்- இலக்கிய வரலாறு- மொழித்திறன்- பூவேந்தன் பதிப்பகம்,சென்னை. .

3 தமிழ் இணையக் கல்விக்கழகம் - TAMIL VIRTUAL ACADEMY
வலைதள முகவரி : https://www.tamilvu.org

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Course Code	Course Name	Category	L	T	P	Credit
221TL1A2HA	HINDI - II: MODERN LITERATURE	LANGUAGE- I	4	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature
- the techniques for expansion of ideas and translation process

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the fundamentals of novels and stories	K1
CO2	Understand the principles of translation work	K2
CO3	Apply the knowledge writing critical views on fiction	K3
CO4	Build creative ability	K3
CO5	Expose the power of creative reading	K2

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓			✓
CO2		✓			✓
CO3		✓			✓
CO4		✓			✓
CO5		✓			✓

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

221TL1A2HA	HINDI – II: MODERN LITERATURE	SEMESTER II

Total Credits: 3

Total Instruction Hours: 60 h

Syllabus

Unit I 13 h

आधुनिकपद्य – शबरी(श्रीनरेशमेहता)

Unit II 13 h

उपन्यास: सेवासदन-प्रेमचन्द

Unit III 12 h

कहानी-किरीट- डा उषा पाठक / डा अचला पाण्डेय

पाठ 1.कफ़न, 3. चीफ़ की दावत

Unit IV 12 h

पत्र लेखन: (औपचारिक या अनौपचारिक)

Unit V 10 h

अनुवाद अभ्यास-III (केवल हिन्दी से अंग्रेजी में) (पाठ 1 to 10)

Text Books

1. प्रकाशक: लोकभारती प्रकाशन पहली मंजिल, दरबारी बिल्डिंग,महात्मा गाँधी मार्ग, इलाहाबाद. (Unit I)
2. प्रकाशक: सुमित्र प्रकाशन 204 लीला अपाट्मेंट्स, 15 हेस्टिंग्स रोड'अशोक नगर इलाहाबाद. (Unit II)
3. प्रकाशक: राधाकृष्ण प्रकाशन दिल्ली. (Unit III)
4. पुस्तक: व्याकरण प्रदिप – रामदेवप्रकाशक: हिन्दी भवन 36 इलाहाबाद. (Unit IV)
5. प्रकाशक: दक्षिण भारत प्रचार सभा चेनैई. (Unit V)

Course Code	Course Name	Category	L	T	P	Credit
221TL1A2MA	MALAYALAM- II: MODERN LITERATURE	LANGUAGE-I	4	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature, to learn the techniques for expansion of ideas and translation process
- the competency in translating simple Malayalam sentences into English and vice versa

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the fundamentals of novels and stories	K1
CO2	Understand the principles of translation work	K2
CO3	Apply the knowledge writing critical views on fiction	K3
CO4	Build creative ability	K3
CO5	Expose the power of creative reading	K2

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓			✓
CO2		✓			✓
CO3		✓			✓
CO4		✓			✓
CO5		✓			✓

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

221TL1A2MA	MALAYALAM- II: MODERN LITERATURE	SEMESTER II

Total Credits: 3

Total Instruction Hours: 60 h

Syllabus

Unit I **Novel** 12 h

Enmakaje: Chapter1- Chapter5

Unit II **Novel** 10 h

Enmakaje: Chapter 6- Chapter 10

Unit III **Novel** 12 h

Enmakaje: Chapter 11- Chapter 15

Unit IV **Autobiography** 14 h

NeermathalamPoothaKalam :Chapter 1- Chapter 10

Unit V **Autobiography** 12 h

NeermathalamPootha Kalam: Chapter 11- Chapter 20

Text Books

1 Ambika Suthan Mangad, Enmakaje (Novel), DC Books Kottayam, Kerala, India. (Unit I to III)

2 Madhavikkutty, NeermathalamPootha Kalam (Autobiography), DC Books Kottayam, Kerala, India. (Unit IV & V)

References

1 Malayala Novel Sahithyam, DC Books Kottayam, Kerala, India.

2 Malayala Sahithya Charithram, National Books Kottayam, Kerala, India.

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Course Code	Course Name	Category	L	T	P	Credit
221TL1A2FA	FRENCH - II: GRAMMAR, TRANSLATION AND CIVILIZATION	LANGUAGE- I	4	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- the Competence in General Communication Skills – Oral + Written- Comprehension & Expression
- the Culture, life style and the civilization aspects of the French people as well as of France
- the Competency in translating simple French sentences into English and vice versa

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the Basic verbs, numbers and accents	K1
CO2	Apply the adjectives and the classroom environment in France	K2
CO3	Evaluate the Plural, Articles and the Hobbies	K3
CO4	Measure the Cultural Activity in France	K3
CO5	Select the sentiments, life style of the French people and the usage of the conditional tense	K2

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓			
CO2		✓			✓
CO3		✓			✓
CO4		✓			✓
CO5		✓			✓

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

221TL1A2FA	FRENCH- II: GRAMMAR, TRANSLATION AND CIVILIZATION	SEMESTER II

Total Credits: 3

Total Instruction Hours: 60 h

Syllabus

Unit I 12 h

Proposer, accepter, refuserune invitation. Indiquer la date.	Organiser une soirée au cinéma avec des amis, par téléphone et par courriel.	Comprendreunemessage d'invitationsurunréponde urtéléphonique. Inviter quelqu'un accepter ourefuserl'invitation.

Unit II 12 h

Prendreet fixer un rendez-vous. Demander etindiquerl'heure.	Organiser une soirée au cinéma avec des amis, par téléphone et par courriel.	Comprendre des personnes qui fixentunrendez-vous par téléphonique. Prendreun rendez-vous par telephone

Unit III 12 h

Exprimer son point de vue positif et négatif. S'informersur le prix. S'informersur la quantitité. Exprimer la quantitité.	En groupes, choisir un cadeau pour un ami.	Exprimer son point de vuesur des idées de cadeau. Faire des achatsdans un magasin

Unit IV 14 h

Demander et indiquer une direction. Localiser (près de, en face de ….). Exprimerl'obligationl' Interdit. Conseiller.	Suivre un itinéraire à l'aided'indications par telephone et d'un plan. Par courrierélectronique, donner des informations et des conseils à un ami qui veut voyager.	Comprendre des indications de direction. Comprendre des indications de lieu. Comprendre une chanson. Comprendre de courts messages qui experiment l'obligation ou l'interdiction. Donner des conseils à des personnes dans des situations données.

Unit V 10 h

Make in Own Sentences

Text Book

1 Regine Merieux, Yves Loiseau, "LATITUDES - 1" (Page No: 56-101) (Methode de Français), Goyal Publisher & Distributors Pvt.Ltd., 86 UB Jawahar Nagar (Kamala Nagar), New Delhi-7 Les Editions Dider, Paris, 2008- Imprime en Roumanie par Canale en Janvier 2012. (Unit I to IV)

Course Code	Course Name	Category	L	T	P	Credit
221EL1A2EA	PROFESSIONAL ENGLISH - II	LANGUAGE- II	4	-	1	3

PREAMBLE

This course has been designed for students to learn and understand

- the language for specific purposes through various literary manuscripts
- the process of communicative competences in academics through authentic contexts
- the different formats of business correspondence with lucidity and accuracy via various media

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn to appreciate the works of eminent writers from various genres	K1
CO2	Construct and comprehend complex situational talks	K3
CO3	Identify formal and informal communicative context to speak fluently	K3
CO4	Infer the denotative and connotative meanings while reading specialized texts	K2
CO5	Develop the skill of writing through descriptions, narrations and essays	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓			✓
CO2		✓			✓
CO3		✓			✓
CO4		✓			✓
CO5		✓			✓

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

221EL1A2EA	PROFESSIONAL ENGLISH - II	SEMESTER II

Total Credits: 3

Total Instruction Hours: 60 h

Syllabus

Unit I Genre Studies 12 h

John Keats: La Belle Dame Sans Merci - Author's Note - title indications- outline- paraphrasing the poem- context of poem- form- poetic devices- enjambment- techniques- Annotations

A. G. Gardiner: On Keyhole Morals- Author's Note- Title indications- Outline - Passage Analysis - context of the Prose - Narrative techniques- Style

Charles Lamb: A Dissertation upon Roast Pig- Author's Note - title indications- outline- paraphrasing the Essay- context of Essay- form- devices- Narrative techniques

John Galsworthy: The Silver Box - Author's Note- Plot Summary- Critical Analysis- Themes- Characters- Description - analysis- Terms- Symbols

Unit II Listening Skills 10 h

Listening to Talks/Lectures by Specialists on selected subject specific topics- Listening to Public Announcements- Listening to Instructions & Directions- Listening to Speeches- Listening to process/event descriptions to identify cause & effects

Unit III Speaking Skills 14 h

Small Talk- Mini Presentations and Making Recommendations- Group Discussions, Debates, and Expressing opinions through Role play– Picture Description- Giving Instruction to Use a Product- Presenting a Product- Summarizing a Lecture- Narrating Personal Experiences/ Events- Interviewing a Celebrity- Scientific Lectures- Educational Videos- Debates- Different Viewpoints on an Issue

Unit IV Reading Skills 12 h

Reading Biographies, Newspaper Reports, Technical Blogs- Reading Advertisements- Gadget Reviews - Newspaper Articles- Journal Reports- Reading Editorials & Blogs- Case Studies- Excerpts from Literary Texts.

Unit V Writing Skills 12 h

Inferring & Interpreting- Predicting Reorganizing Material- Summary Writing Based on the Reading Passages- Writing – Emails & Essay Writing (Descriptive or narrative)- Grammar - Tenses- Question Types: Wh/ Yes or No/ and Tags.

Text Books

1. <https://www.poetryfoundation.org/poems/44475/la-belle-dame-sans-merci-a-ballad/> (Unit I)
2. <https://sittingbee.com/on-keyhole-morals-a-g-gardiner/> (Unit I)
3. <https://www.gradesaver.com/charles-lamb-essays/study-guide/summary- a-dissertation-upon-roast-pig/> (Unit I)
4. <https://public-library.uk/ebooks/41/61.pdf- The Silver Box- John Galsworthy/> (Unit I)
5. Hart, Steve, Aravind R. Nair, Veena Bhambhani. 2016. Embark: English for Undergraduates. Cambridge University Press, New Delhi, India. (Unit II)
6. Lakshminarayanan. 2012. A Course Book On Technical English. Scitech Publications Pvt. Ltd, New Delhi, India. (Unit III)
7. Raman, Meenakshi & Sangeeta Sharma. 2016. Technical Communication-Principles And Practice, Oxford University Press, New Delhi, India. (Unit IV)
8. Viswamohan, Aysha. 2017. English For Technical Communication (With CD), McGraw Hill (India) Private Limited, New Delhi, India. (Unit V)

References

1. Bajwa and Kaushik. 2010. Springboard to Success- Workbook for Developing English and Employability Skills. Orient Black Swan, Chennai, India.
2. Chellammal, V. 2003. Learning to Communicate. Allied Publishing House, New Delhi, India.
3. Krishnaswamy. N, Lalitha Krishnaswamy & B.S. Valke. 2015. Eco English, Learning English through Environment Issues. An Integrated, Interactive Anthology. Bloomsbury Publications, New Delhi, India.
4. Syamala. V. 2002. Effective English Communication for You. Emerald Publishers, Chennai, Tamil Nadu, India.

Course Code	Course Name	Category	L	T	P	Credit
224CA1A2CA	DATA STRUCTURES	CORE	4	1	-	4

PREAMBLE

This course has been designed for students to learn and understand

- Fundamental concept of data structure with effective utilization of space and time
- Linear and nonlinear data structures
- Different Searching, Sorting and Hashing techniques

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the fundamentals of data structures and algorithmic complexity	K2
CO2	Demonstrate the operations of Stack and Queue and their applications	K2
CO3	Implement operations on linked list and its variants	K3
CO4	Apply non linear data structures such as trees and graphs in problem solving	K3
CO5	Analyze the various sorting, searching algorithms and hashing techniques	K4

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓				✓
CO2	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓

COURSE FOCUSES ON

✓	Skill Development		Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

224CA1A2CA	DATA STRUCTURES	SEMESTER II

Total Credits: 4

Total Instruction Hours: 60 h

Syllabus

Unit I Introduction to Data Structures and Arrays 10 h

Introduction: Basic Terminology -Classification of Data Structures -Operations on Data Structures-Abstract Data Type-Algorithms-Time and Space Complexity -Big O Notation-Omega Notation (Ω) -Theta Notation (Φ). Arrays: Declaration of Arrays-Accessing the elements of an array-Storing values in Arrays-Operations on Arrays. Applications of Arrays: Sparse Matrices

Unit II Stacks and Queues 12 h

Stacks: Array Representation of Stacks- Operations on a Stack-Linked Representation of Stacks. Applications of Stacks: Evaluation of Arithmetic Expressions –Recursion. Queues: Array Representation of Queues - Operations on Queues -Linked Representation of Queues - Circular Queues. Applications of Queues: JOB Scheduling

Unit III Linked Lists 12 h

Singly Linked Lists: Inserting a node in a Linked List- Deleting a node from a Linked List. Circular Linked Lists: Inserting a node in a Circular Linked List - Deleting a node from a Circular Linked List. Doubly Linked Lists: Inserting a node in a Doubly Linked List - Deleting a node from a Doubly Linked List. Applications of Linked Lists: Polynomial Addition

Unit IV Trees and Graphs 14 h

Trees: Binary Trees – Representation of Binary Trees -Creating a Binary Tree - Traversing a Binary Tree- Binary Search Trees and its Operations - Threaded Binary Trees. Applications of Trees: Expression Trees. Graphs: Graph Terminology - Representation of Graphs - Graph Traversal Algorithms.Applications of Graphs: Shortest Path Algorithm : Dijkstra's Algorithm. Minimum Spanning Trees : Prim's Algorithm

Unit V Searching , Sorting and Hashing 12 h

Searching: Linear search –Binary Search. Sorting: Bubble Sort - Insertion Sort - Selection Sort – Quick Sort-Merge Sort -Heap Sort. Hashing and Collision: Hash Tables - Hash Functions - Collision. Applications of Hashing: Keyword Table in a Compiler.

Text Books

1 Reema Thareja, 2018, "Data Structures using C", Second Edition, Oxford University Press.

2 G A V Pai, 2017, "Data Structures and Algorithms: Concepts - Techniques and Applications", McGraw Hill Education.

References

1 Mark Allen Weiss, 2014, "Data Structures and Algorithm Analysis in C++", Third Edition , Pearson education.

2 Yashavant Kanetker, 2003, "Data Structure Through C++ Paperback" ,4th Edition, BPB Publications.

3 Lipchitz (Schaum's Outline Series), 2010,"Data Structures with C", McGraw Hill Education.

4 https://www.tutorialspoint.com/data_structures_algorithms/index.htm

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Course Code	Course Name	Category	L	T	P	Credit
224CS1A2CA	OBJECT ORIENTED PROGRAMMING WITH C++	CORE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- The object orientedprogramming principles.
- The structure and features of C++.
- The design and implementation of OOPs concepts using C++.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Describe the concepts of object oriented programming and basic constructs of C++ programming	K1
CO2	Design simple applications using classes and objects	K2
CO3	Illustrate the concept of Inheritance and apply pointers and strings	K3
CO4	Apply polymorphism and exception handling in program design	K3
CO5	Implement programs using File Management and STL	K4

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓				✓
CO2	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓

COURSE FOCUSES ON

✓	Skill Development		Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

224CS1A2CA	OBJECT ORIENTED PROGRAMMING WITH C++	SEMESTER II

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Introduction to Object Oriented Programming 8 h

Introduction - Programming Paradigms - Key concepts of Object-Oriented Programming – Applications of Object-Oriented Programming - Variable, Value and Constant - Components of a C++ Program - Data Types - Expressions - Type Conversion - Order of Evaluation - Formatting Data: Manipulators in Input/Output- Branching and Looping.

Unit II Classes and Arrays 10 h

User-Defined Types: Classes-Class Definition-Member function- Access Modifiers-Inline function- Constructors and Destructors- Instance Members: Instance Data Members-Instance Member Functions -Static Members - Arrays: One-Dimensional Arrays - Multidimensional Arrays. Case Study: Wave Array

Unit III Pointers, Strings and Inheritance 10 h

References - Pointers - Pointer Types and Pointer variables - Constant Modifiers – Pointer to Pointer- Arrays and Pointers - Strings: C ++ String Class -C++ String Library – Inheritance: Private, Public and Protected Inheritance - Association - Dependency

Unit IV Polymorphism and Exception Handling 10 h

Polymorphism- Binding- Abstract Class : Pure Virtual Functions - Multiple Inheritance - Overloading Principles - Overloading as Member- Nonmember: Friend function-Exception Handling : Approach- Exceptions in Classes - Standard Exception Classes – Templates: Function Template - Class Template.

Unit V File Handling and Standard Template Library 10 h

Input and Output stream – Stream Classes - Console Streams - Console Objects - Stream State - File Streams - File I/O - Opening Modes - Sequential Vs Random Access - String Streams - Formatting Data: Direct use of Flags, Fields and Variables - Predefined Manipulators-Standard Template Library: Iterators, Sequence Containers, Container Adapters.

Text Books

1 Ashok Kamthane, 2017, "Object-Oriented Programming with ANSI and Turbo C++ 3rd Edition", Pearson (Unit 1.1 to 1.3).

2 Behrouz A. Forouzan, Richard F. Gilberg, 2020, "C++ Programming: An Object-Oriented Approach", McGraw-Hill Education (Unit I to V).

References

1 Bjarne Stroustrup, 2022, "C++ Programming Language, Fourth Edition" Pearson.

2 E Balagurusamy, 2020, "Object-Oriented Programming with C++, 8th Edition", McGraw Hill Education

3 M. Ashwin, V. Sreeprada, M. Santhosh, 2022, "A Hand Book on C++ Programming", Notion Press

4 YashavantKanetkar, 2020, "Let Us C++", BPB Publications.

5 https://www.codecademy.com/

6 https://www.simplilearn.com/

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224CA1A2CP	CORE PRACTICAL-II: DATA STRUCTURES AND C++	SEMESTER II

Total Credits: 2
Total Instructions Hours: 48 h

S.No	Contents
1	Program to demonstrate the operations of Stack
2	Program to implement the operations of Queue
3	Program to illustrate Linear and Binary Search
4	Program to implement Bubble sort and Quick sort
5	Program to design Singly Linked List
6	Program to illustrate Tree Traversal
7	Program to implement Classes and Objects
8	Program to demonstrate Method overloading
9	Program to analyze Constructors and Destructors
10	Program to implement Inheritance
11	Program to apply Virtual functions
12	Program to demonstrate Exception Handling

Note: Out of 12 – 10 Mandatory

Course Code	Course Name	Category	L	T	P	Credit
222MT1A2IC	DISCRETE MATHEMATICS	IDC	4	1	-	4

PREAMBLE

This course has been designed for students to learn and understand

- the logical operators and applications
- the concept of relation and functions.
- the application of graph theory, trees and automata.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the concept of set theory	K1
CO2	Interpret the various optimization problems in term of relations and functions	K3
CO3	Identify applications of logical operators	K2
CO4	Determine the concept of graph theory and trees	K2
CO5	Apply the concept Finite state automation in defining the grammars.	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓		✓	✓	✓
CO2	✓		✓		✓
CO3	✓	✓	✓	✓	✓
CO4	✓			✓	
CO5			✓	✓	✓

COURSE FOCUSES ON

✓	Skill Development		Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

222MT1A2IC	DISCRETE MATHEMATICS	SEMESTER II

Total Credits: 4

Total Instruction Hours: 60 h

Syllabus

Unit I Set Theory 10 h

Introduction - set and its elements - set description - types - Venn-Euler Diagrams - set operations and laws of set theory - fundamental products - index and indexed sets - partitions of sets - minsets - countable and uncountable sets - Algebra of sets and duality - computer representation - the inclusion and exclusion principle- Fuzzy sets

Unit II Relations and Functions 12 h

Relations: Introduction - cartesian product of sets - binary relations – set operations on relations - types– partial order relations – equivalence relation and classes- Functions: Introduction - types – invertible functions - composition of functions.

Unit III Mathematical Logic 10 h

Introduction - propositional calculus – basic logical operations - statements generated by a set - conditional statements -converse, inverse and contrapositive statements - biconditional - tautologies - contradiction - contingency - argument - methods of proof - equivalence and implication - predicate calculus-quantifiers

Unit IV Graph Theory and Trees 14 h

Introduction - paths, cycles and connectivity - subgraphs - types - isomorphic and homeomorphic graphs - representation of graphs in computer memory- Eulerian and Hamiltonian graphs-cartesian product- shortest path.

Trees: Introduction - binary trees - complete binary tree - tree of an Algebraic expression - traversing binary trees.

Unit V Language , Grammar and Automata 14 h

Introduction - language: the set theory of strings - languages – regular expressions and regular languages – Grammar – finite state machine – finite state automata.

Note: Distribution of marks 80% Problem and 20% Theory.

Text Books

1 Sharma J.K., 2022 "Discrete Mathematics", 4th Edition, Trinity Press, New Delhi.

References

1 Tremblay J.P. and Manohar R, 1997,"Discrete Mathematics Structures with Applications to computer science", 2nd Edition, McGraw Hill International, New York

2 Venkataraman M.K. Sridharan N. and Chandarasekaran N, 2000,"Discrete Mathematics", The National publishing Company, Chennai.

3 Kolman B,Busby R.C.and Ross S.C,2006,"Discrete Mathematical Structures",5th Edition., Prentice hall of India Pvt. Ltd., New Delhi

4 Kenneth H Rosen, 1999, "Discrete Mathematics and its Applications",4th Edition, McGraw-Hill, New Delhi.

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221TL1A2AA	PART-IV : BASIC TAMIL	SEMESTER II

Total Credits: 2

Total Instruction Hours: 24 h

Syllabus

இளங்கலை 2022 – 23ஆம் கல்வியாண்டு முதல் சேர்வோர்க்குரியது

(10 மற்றும் 12 – ஆம் வகுப்பு வரை தமிழ் மொழிப்பாடம் பயிலாதவர்களுக்கு)

(பருவத் தேர்வு இல்லை)

Syllabus

Unit I தமிழ் மொழியின் அடிப்படைக் கூறுகள் 05 h

எழுத்துகள் அறிமுகம்

1. உயிர் எழுத்துக்கள் - குறில் , நெடில் எழுத்துகள்
2. மெய் எழுத்துக்கள் - வல்லினம், மெல்லினம், இடையினம்
3. உயிர்மெய் எழுத்துக்கள்
4. பயிற்சி

Unit II சொற்களின் அறிமுகம் 05 h

1.பெயர்ச்சொல்

2.வினைச்சொல் – விளக்கம் (எ.கா.)

3.பயிற்சி

Unit III குறிப்பு எழுதுதல் 05 h

1. பெயர், முகவரி, பாடப்பிரிவு , கல்லூரியின் முகவரி
2. தமிழ் மாதங்கள்(12), வாரநாட்கள்(7)
3. எண்கள் (ஒன்று முதல் பத்து வரை), வடிவங்கள், வண்ணங்கள்

Unit IV குறிப்பு எழுதுதல் 05 h

1. ஊர்வன, பறப்பன, விலங்குகள்
2. மனிதர்களின் உறவுப்பெயர்கள்
3. ஊர்களின் பெயர்கள் (எண்ணிக்கை 10)

Unit V பயிற்சிப் பகுதி 04 h

பயிற்சிப் பகுதி (உரையாடும் இடங்கள்)

வகுப்பறை, பேருந்து நிலையம், சந்தை – பேசுதல், எழுதுதல்.

Notes:

அக மதிப்பீட்டுத் தேர்வு - வினாத்தாள் அமைப்பு முறை — மொத்த மதிப்பெண்கள் - 50

பகுதி – அ

சரியான விடையைத் தேர்வு செய்தல் — 10x2=20

பகுதி – ஆ

சரியா? தவறா? — 10x2=20

பகுதி – இ

ஒரு பக்க அளவில் விடையளிக்க — 1x10=10

குறிப்பு:

- அனைத்து அலகுகளில் இருந்தும் வினாக்கள் அமைதல் வேண்டும்
- பகுதி இ –க்கான வினாக்கள் இது அல்லது அது என்ற அடிப்படையில் அமைதல் வேண்டும்

Text Book

1 அடிப்படைத் தமிழ் - 2022-2023, தொகுப்பு: தமிழ்த்துறை, டாக்டர் என்.ஜி.பி. கலை அறிவியல் கல்லூரி, கோயம்புத்தூர் – 641048, வெளியீடு: நியூ செஞ்சுரி புக் ஹவுஸ், சென்னை. (Unit I to IV)

References

1 ஒன்றாம் வகுப்பு பாடநூல் - தமிழ்நாடு அரசு பாடநூல் கழகம், சென்னை.

2 தமிழ் இணையக் கல்விக்கழகம் - TAMIL VIRTUAL ACADEMY
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221TL1A2AB	PART - IV : ADVANCED TAMIL	SEMESTER II

Total Credits: 2

Total Instruction Hours: 24 h

இளங்கலை 2022– 2023 ஆம் கல்வியாண்டு முதல் சேர்வோர்க்குரியது

(10 மற்றும் 12 – ஆம் வகுப்புகளில் தமிழ் மொழிப்பாடம் பயின்றவர்களுக்கு உரியது)

(பருவத் தேர்வு இல்லை)

Syllabus

Unit I கவிதைகள் 06 h

1தமிழ்நாடு - பாரதியார்

2.மனதில் உறுதி வேண்டும் - பாரதியார்

3. இன்பத்தமிழ் - பாரதிதாசன்

4.வேலைகளல்ல வேள்விகள் - தாராபாரதி

5.தமிழா! நீ பேசுவது தமிழா! - காசியானந்தன்

6. நட்புக் காலம் (10 கவிதைகள்) - அறிவுமதி கவிதைகள்

Unit II கட்டுரை 05 h

கட்டுரைத் தொகுப்பு - நல்வாழ்வு - டாக்டர் மு.வரதராசன்

1. நம்பிக்கை

2. புலனடக்கம்

3. பண்பாடு

Unit III இலக்கணம் 04 h

1.வல்லினம் மிகும் மற்றும் மிகா இடங்கள்

2. ர,ற,ல,ழ,ள,ந,ண,ன – வேறுபாடு அறிதல்

Unit IV கடிதங்கள் 05 h

1. பாராட்டுக் கடிதம்

2. நன்றிக் கடிதம்

3. அழைப்புக் கடிதம்

4. அலுவலக விண்ணப்பங்கள்

Unit V பயிற்சிப் பகுதி 04 h

படைப்பாக்கப் பகுதி

பொதுத் தலைப்புகளில் கவிதை, கட்டுரை எழுதச் செய்தல்

Notes

அக மதிப்பீட்டுத் தேர்வு - வினாத்தாள் அமைப்பு முறை — மொத்த மதிப்பெண்கள் - 50

பகுதி – அ

சரியான விடையைத் தேர்வு செய்தல் — 10x1=10

பகுதி – ஆ

கோடிட்ட இடங்களை நிரப்புக. — 10x2=20

பகுதி – இ

இரண்டு பக்க அளவில் விடையளிக்க — 2x10=20

குறிப்பு:

- அனைத்து அலகுகளில் இருந்தும் வினாக்கள் அமைதல் வேண்டும்
- பகுதி இ –க்கான வினாக்கள் இது அல்லது அது என்ற அடிப்படையில் அமைதல் வேண்டும்

Text Book

1 சிறப்புத் தமிழ் - 2022-2023, தொகுப்பு: தமிழ்த்துறை, டாக்டர் என்.ஜி.பி. கலை அறிவியல் கல்லூரி, கோயம்புத்தூர். வெளியீடு: நியூ செஞ்சுரி புக் ஹவுஸ், சென்னை. (Unit- I to IV)

References

1 பேராசிரியர் புலவர் சோம. இளவரசு, எட்டாம் பதிப்பு. 2014. தமிழ் இலக்கிய வரலாறு – மணிவாசகர் பதிப்பகம், சென்னை.

2 டாக்டர் மு.வரதராசன். 2010. நல்வாழ்வு, பாரி நிலையம், சென்னை.

3 பேராசிரியர் முனைவர் பாக்கியமேரி, முதற் பதிப்பு. 2013. இலக்கணம் - இலக்கிய வரலாறு - மொழித்திறன் - பூவேந்தன் பதிப்பகம், சென்

4 தமிழ் இணையக் கல்விக்கழகம் - TAMIL VIRTUAL ACADEMY
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Course Code	Course Name	Category	L	T	P	Credit
225CR1A2AA	HUMAN RIGHTS AND WOMEN'S RIGHTS	AECC	2	-	-	2

PREAMBLE

This course has been designed for students to learn and understand

- Concepts of Human Rights
- human Right Violations and Redressal Mechanism
- rights to Women and Child

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the Basic concepts of Human Rights	K1
CO2	Describing Fundamental Rights	K2
CO3	Impart knowledge on Human Right Violations and Redressal Mechanism.	K4
CO4	Extend a comprehensive knowledge on Rights to Women and Child	K3
CO5	Analyze the knowledge on Civil and Political Rights of Women	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓			✓
CO2		✓			
CO3		✓			
CO4		✓			✓
CO5		✓			✓

COURSE FOCUSES ON

	Skill Development		Entrepreneurial Development
	Employability		Innovations
	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

225CR1A2AA	HUMAN RIGHTS AND WOMEN'S RIGHTS	SEMESTER II

Total Credits: 2

Total Instruction Hours: 24 h

Syllabus

Unit I Introduction to Human Rights 04 h

Meaning - Definition - Nature - Content - Legitimacy of Human Rights - Origin and Development of Human Rights - Theories – Principles of Magna Carta – Modern Movements of Human Rights – The Future of Human Rights.

Unit II Human Rights in India 05 h

The Constitution of India – Fundamental Rights – Right to Life and Liberty – Directive Principles of State Policy – Fundamental Duties – Individual and Group Rights – Other facets of Human Rights – Measures for Protection of Human Rights in India.

Unit III Human Right Violations and Redressal Mechanism 05 h

Human Rights – Infringement of Human Right by State Machinery and by Individual – Remedies for State action and inaction – Constitutional Remedies – Public Interest Litigation (PIL) - Protection of Human Rights Act, 1993 – National Human Rights Commission – State Human Rights Commissions – Constitution of Human Right Courts.

Unit IV Rights to Women and Child 05 h

Matrimonial protection - Protection against dowry-Protection to pregnancy-Sexual offences - Law relating to work Place - Directive principles of Constitution (Article 39 a, d, e & Article 42, 43 & 46) - Trafficking of women - Constitutional Rights – Personal Laws - Protection of children against Sexual Offences Act 2012 (POCSO).

Unit V Civil and Political Rights of Women 05 h

Right of Inheritance - Right to live with decency and dignity - The Married women's Property Act 1874 - Women's right to property - Women Reservation Bill - National Commission for Women - Political participation - Pre independent political participation of women - Participation of Women in post independent period.

Text Books

1 LalitParmar, 1998, "Human Rights", Anmol Publications Pvt. Limited, New Delhi.

2 Krishna Pal Malik, 2009, "Women & Law", Allahabad Law University, New Delhi.

References

1 Mandagadde Rama Jois, 2015, "Human Rights", Bharatiya Values, Bharatiya Vidya Bhavan Publications, Mumbai.

2 Paras Diwan and PiyushDiwan, 1994, "Women and Legal Protection", South Asia Books, Andhra Pradesh.

3 Venkataramand Sandhiya. N, 2001, "Research in Value Education", APH Publishing Corporation, New Delhi.

4 Anand A S, 2008, "Justice for Women: Concerns and Expressions", Universal Law Publishing Co., New Delhi.

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Course Code	Course Name	Category	L	T	P	Credit
221TL1A3TA	TAMIL - III	LANGUAGE - I	3	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- மொழிப்பாடங்களின் வாயிலாக தமிழரின் பண்பாடுநாகரீகம், பகுத்தறிவு ஆகியவற்றை அறியச் செய்தல்
- கலை மற்றும் மரபுகளை அறியச் செய்தல்
- மாணவர்களின் படைப்பாக்கத்திறன்களை ஊக்குவித்தல்

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	வாழ்க்கைத்திறன்கள் (Life Skills) - மாணவர்களின் செயலாக்கத்திறனை ஊக்குவித்தல்	K1
CO2	மதிப்புக்கல்வி (Attitude and Value education)	K2
CO3	பாடஇணைச்செயல்பாடுகள் (Co-curricular activities)	K2
CO4	சூழலியல் ஆக்கம் (Ecology)	K3
CO5	மொழி அறிவு(Tamil knowledge)	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓			
CO2		✓			
CO3		✓			
CO4		✓			
CO5		✓			

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

221TL1A3TA	TAMIL - III	SEMESTER III

Total Credits: 3

Total Instruction Hours: 48 h

Syllabus

Unit I காப்பியங்கள் 10 h

1. சிலப்பதிகாரம் – வழக்குரை காதை
2. மணிமேகலை – ஆதிரை பிச்சையிட்ட காதை

Unit II காப்பியங்கள் 10 h

1. கம்பராமாயணம் - கும்பகர்ணன் வதைப்படலம்: பா. எண் : 60 முதல் – 100 வரை
2. பெரிய புராணம் - அதிபத்த நாயனார் புராணம்

Unit III சிற்றிலக்கியங்கள் 10 h

1.திருக்குற்றாலக்குறவஞ்சி - வசந்தவல்லி பந்தாடிய சிறப்பு (6: 4 கண்ணிகள்)

2.கலிங்கத்துப்பரணி- களம் பாடியது: போர்க்களக் காட்சி- பா.எண்: 472 முதல்- 502 வரை

Unit IV இலக்கிய வரலாறு 10 h

1.காப்பியங்களின் தோற்றமும் வளர்ச்சியும்

2.சிற்றிலக்கியங்களின் தோற்றமும் வளர்ச்சியும்

3.நாடகத்தின் தோற்றமும் வளர்ச்சியும்

Unit V இலக்கணம் & பயிற்சிப் பகுதி 08 h

அ. இலக்கணம்

1.'பா' வகைகள் : வெண்பா, ஆசிரியப்பா, கலிப்பா, வஞ்சிப்பா - பொது இலக்கணம் மட்டும்.

2. அணி: உவமையணி, உருவக அணி, இல்பொருள் உவமையணி விளக்கம், உதாரணம்.

ஆ. பயிற்சிப் பகுதி

1. வாசகர் கடிதம் : நாளிதழ்,வானொலி,செய்தி ஊடகங்களுக்கு

விமர்சனம் எழுதுதல்

2.திரைக்கதை : மத்திய மற்றும் மாநில அரசு விருது பெற்ற தமிழ்த் திரைப்படங்கள் மட்டும்

Text Book

1 தமிழ் மொழிப்பாடம் - 2022-2023, தொகுப்பு: தமிழ்த்துறை, டாக்டர் என். ஜி. பி. கலை அறிவியல் கல்லூரி, கோயம்புத்தூர். வெளியீடு: நியூ செஞ்சுரி புக் ஹவுஸ், சென்னை. (Unit I to V)

References

1 பேராசிரியர் புலவர் சோம. இளவரசு, எட்டாம் பதிப்பு - 2014, தமிழ் இலக்கிய வரலாறு- மணிவாசகர் பதிப்பகம், சென்னை.

2 பேராசிரியர் முனைவர் பாக்கியமேரி, முதற் பதிப்பு- 2013, இலக்கணம் - இலக்கிய வரலாறு - மொழித்திறன் - பூவேந்தன் பதிப்பகம், சென்னை. .

3 தமிழ் இணையக் கல்விக்கழகம் - TAMIL VIRTUAL ACADEMY. வலைதள முகவரி: https://www.tamilvu.org

Course Code	Course Name	Category	L	T	P	Credit
221TL1A3HA	HINDI - III	LANGUAGE- I	3	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature
- the techniques for expansion of ideas and translation process

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the fundamentals of novels and stories	K1
CO2	Understand the principles of translation work	K2
CO3	Expose the knowledge writing critical views on fiction	K2
CO4	Build creative ability	K3
CO5	Apply the power of creative reading	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓			
CO2		✓			
CO3		✓			
CO4		✓			
CO5		✓			

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

221TL1A3HA	HINDI – III	SEMESTER III

Total Credits: 3

Total Instruction Hours: 48 h

Syllabus

Unit I 10 h

पद्य – काव्य पराशर (भोलानाथ)

(प्राचीन- कबीर, तुलसी, सुर, मीरा, आधुनिक- मैथिलीशरण गुप्त, अरूण कमल)

Unit II 10 h

हिन्दी साहित्य का इतिहास: (साधारण ज्ञान)

Unit III 10 h

अलंकार:अनुप्रास,यमक, श्लेष, वक्रोक्ति, उपमा,रूपक

Unit IV 10 h

संवाद लेखन

Unit V 08 h

अनुवाद अभ्यास-III (केवल हिन्दी से अंग्रेजी में)

(पाठ 10 to 20)

Text Books

1 प्रकाशक: जवाहर पुस्तकालय सदर बाजार, मथुरा उत्तर प्रदेश-281001 (Unit I)

2 आचार्य रामचन्द्र शुक्ल लोकभारती प्रकाशन इलाहाबाद. (Unit II)

3 प्रकाशक: विनोद पुस्तक मंदिर आगरा-282002 (Unit III)

4 पुस्तक: व्याकरण प्रदिप – रामदेव प्रकाशक: हिन्दी भवन 36 इलाहाबाद-211024 (Unit IV)

5 प्रकाशक: दक्षिण भारत प्रचार सभा चेनैई -17 (Unit V)

Course Code	Course Name	Category	L	T	P	Credit
221TL1A3MA	MALAYALAM - III	LANGUAGE- I	3	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature, to learn the techniques for expansion of ideas and translation process
- the competency in translating simple Malayalam sentences into English and vice versa

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the fundamentals of novels and stories	K1
CO2	Understand the principles of translation work	K2
CO3	Expose the knowledge writing critical views on fiction	K2
CO4	Build creative ability	K3
CO5	Apply the power of creative reading	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓			
CO2		✓			
CO3		✓			
CO4		✓			
CO5		✓			

COURSE FOCUS ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

221TL1A3MA	MALAYALAM - III	SEMESTER III

Total Credits: 3

Total Instruction Hours: 48 h

Syllabus

Unit I **Poetry** 10 h

Kumaranasan

Unit II **Poetry** 10 h

Kumaranasan

Unit III **Poetry** 10 h

Kumaranasan

Unit IV **Poetry** 10 h

Vayalar Ramavarma

Unit V **Poetry** 08 h

Vayalar Ramavarma

Text Books

1 Kumaranasan. 1998. Chinthavishtayaya Sitha. DC Books Kottayam, Kerala, India. (Unit I to III)

2 Ayisha (Poem), National Book Stall Kottayam, Kerala, India. (Unit IV & V)

Reference

1 Dr.M.Leelavathy. Kavitha Sahithya Charithram. Sahithya Academy Thrissur, Kerala, India.

Course Code	Course Name	Category	L	T	P	Credit
221TL1A3FA	FRENCH - III	LANGUAGE- I	3	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- the Competence in General Communication Skills – Oral + Written- Comprehension & Expression
- the Culture, life style and the civilization aspects of the French people as well as of France
- the students to acquire Competency in translating simple French sentences into English and vice versa

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the Basic verbs, numbers and accents	K1
CO2	Apply the adjectives and the classroom environment in France	K2
CO3	Select the Plural, Articles and the Hobbies	K2
CO4	Measure the Cultural Activity in France	K3
CO5	Evaluate the sentiments, life style of the French people and the usage of the conditional tense	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓			
CO2		✓			
CO3		✓			
CO4		✓			
CO5		✓			

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

221TL1A3FA	FRENCH - III	SEMESTER III

Total Credits: 3
Total Instruction Hours: 48 h

Syllabus

Unit I

10 h

° Décrireun lieu. ° Situer	A partird'unerecherche de documents, composer une presentation touristique pour un magazine ou un site internet.	Comprehendre la description d'un lieu. Décrireunevilleouunerégionq u'onaime. Interrogersur la situation of d'un lieu. Comprendre des indications sur la fréquenced'actions.	Comprendreune presentation de catalogue touristique. Comprendre des pictogrammes. Comprendre la description d'un lieu et d'une situation precise dans un message électronique.

Unit II

10 h

Se situerdans le temps.	A partird'unerecherc he de documents, composer une presentation touristique pour un magazine ou un site internet.	Comprehendre la description d'un lieu. Décrireunevilleouunerégio nqu'onaime. Interrogersur la situation of d'un lieu. Comprendre des indications sur la fréquenced'actions.	Comprendreune presentation de catalogue touristique. Comprendre des pictogrammes. Comprendre la description d'un lieu et d'une situation precise dans un message électronique.

Unit III

10 h

Raconter. ° Décrire les étapesd'une action.	Raconterune scene insolite à l'oreal et à l'écrit.	Comprehendre le récit d ún voyage. Raconterses actions quotidiennes.	Ecrire une biographie a partir d'eléments écrits.

Unit IV

10 h

Exprimer l'intensité et la quantité. ° Interroger.	Raconterune scene insoliteà l'oreal et à l'écrit.	Comprehendre le récit d ún voyage. Raconterses actions quotidiennes.	Ecrire une biographie a partir d'eléments écrits.

Unit V

08 h

Make in Own Sentences based on the above Lessons

Text Book

1 LATITUDES 1 (Méthode de français) Pages from 102-127, Author : Regine Mérieux, Yves Loiseau (Unit I to IV)

Course Code	Course Name	Category	L	T	P	Credit
221EL1A3EA	PROFESSIONAL ENGLISH - III	LANGUAGE- II	3	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- the basics of English grammar and specific usage
- the importance of the vocabulary and use in different contexts
- the necessity of communication and composition writing skills

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Infer the specific usage of while-listening process	K2
CO2	Organize the various abilities and sub-skills involved in reading	K3
CO3	Utilize the importance of speaking skills and developing it through various practices	K3
CO4	Assume the sentence construction and paragraph development	K4
CO5	Acquire all-round mature outlook to function effectively in different context	K4

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓			
CO2		✓			
CO3		✓			
CO4		✓			
CO5		✓			

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

221EL1A3EA	PROFESSIONAL ENGLISH - III	SEMESTER III

Total Credits: 3

Total Instruction Hours: 48 h

Syllabus

Unit I Listening and Reading 09 h

Listening in casual conversation, Small group and Conference setting - Listening for Factual Information, Detail and Situation - Developing Listening skills- Why do we avoid Listening- Poor Listening - Disadvantages - Poor listening vs Effective Listening - Basics of Reading- efficient and inefficient readers- Advantages – Benefits and Effective reading and comprehension skills- Need for Developing Efficient Reading skills- Four Basic steps of Effective Reading - Stumbling blocks in becoming an effective Reader- Improving Vocabulary power- Strategies for Comprehending and Retaining content- Effective Note Taking while Reading

Unit II Speaking 11 h

Purpose of General Conversations- Advantages, features of a good conversation- Tips for improving conversation- public speaking- importance of public speaking- Benefits, Tips, Overcoming fear of public speaking- Preparatory steps - Structuring the contents- Audience Awareness- Mode of Delivery

Unit III Writing Skills 10 h

CV and Job Applications- How to make your letter stand out?- Employers expectation - Organize the material – Useful suggestions- Cover Letter- Content to be included – Tone of the letter - Report Writing- importance – features- Types – main parts – Feasibility report– Accident report- Scientific report- Memos – Introduction – Structure- Proposal Writing- Key factors- Types- Contents- Format- Evaluation

Unit IV Effective Skills in Language 10 h

Using Word's Effectively- Mastering Spelling Techniques- Structuring Phrases and Clauses- Writing Effective Sentences– Building Effective paragraphs- Revising, Editing and Proof reading

Unit V Soft Skills 08 h

Introduction- What are soft skills?- Importance of soft skills- Attributes- Social soft skills- Thinking- Negotiating- Exhibiting- Identifying- Improving- Will formal training enhance your soft skills? - Soft Skills training -Train Yourself- Practicing soft skills- Measuring attitude – Self-Discovery: Importance of knowing yourself- Process - SWOT analysis – Benefits – Usage – SWOT Analysis grid

Text Books

1 Camp and Satterwhite. 1998. College English and Communication. 7th Edition Glencoe Mchrawttill Publishers, New York, Unites States of America. (Unit I, II, III)

2 Kumar, Sanjay and Lata Pushp. 2018. Language and Communication Skills for Engineers. First Edition, Oxford University Press, India. (Unit I, II, III)

3 Mohan, Krishna and Banerji, Meera. 2009. Developing Communication skills. 2nd Edition, Macmillcan, India. (Unit I, II, III, IV)

4 Alex. Soft Skills. 2009. S. Chand Publishing, New Delhi, India. (Unit V)

References

1 Ghosh, B.N. Editor. 2017. Managing Soft Skills for Personality Development. McGraw- Hill Education, Chennai, India.

2 Miles Craven. 2008. Cambridge English Skills Real Listening and Speaking. First Edition, Cambridge University Press, United Kingdom.

3 Mishra, Gauri and Ranjana Kaul.2016. Language Through Literature. Primus Books, India.

4 Pillai G, Radhakrishna. 2000. English for Success. Emerald Publishers, Chennai, India.

Course Code	Course Name	Category	L	T	P	Credit
224CA1A3CA	DATABASE MANAGEMENT SYSTEMS	CORE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- The functional components of the DBMS and the normalization forms in building an effective database tables
- Queries using Relational Algebra, Relational Calculus and SQL
- The Development of application programs using PL/SQL

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic concepts of database concepts, design, modeling and normalization	K1
CO2	Obtain knowledge on database environment	K2
CO3	Know the DML commands	K2
CO4	Learn the concepts of PL/SQL	K3
CO5	Analyze the various composite data types	K4

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓		✓
CO2	✓			✓	✓
CO3	✓				✓
CO4	✓		✓	✓	✓
CO5			✓	✓	✓

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

224CA1A3CA	DATABASE MANAGEMENT SYSTEMS	**SEMESTER** III

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Database Concepts and Normalization 10 h

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

Unit II Structured Query Language 8 h

Oracle9i: An introduction – SQL* plus Environment - Structured Query Language (SQL). Oracle Tables (DDL): Naming Rules and conventions – Data Types – Constraints – Creating Oracle Table – Displaying Table Information – Altering an Existing Table – Dropping, Renaming, Truncating Table – Table Types – Spooling – Error codes.

Unit III Working with Tables 10 h

Data Management and Retrieval: DML – adding a new Row/Record – Customized Prompts – Updating and Deleting an Existing Rows/Records – Retrieving Data from Table – Arithmetic Operations – Restricting Data with WHERE clause – Sorting – Revisiting Substitution Variables – DEFINE command – CASE structure. Functions and Grouping: Built-in functions – Grouping Data. Multiple Tables: Joins and Set operations: Join – Set operations.

Unit IV Fundamentals of PL/SQL 10 h

PL/SQL: History – Fundamentals – Block Structure – Comments – Data Types –Other Data Types – Declaration – Assignment operation – Bind variables – Substitution Variables – Printing – Arithmetic Operators. Control Structures and Embedded SQL: Control Structures – Nested Blocks – SQL in PL/SQL – Data Manipulation – Transaction Control statements. PL/SQL Cursors and Exceptions: Cursors – Implicit & Explicit Cursors and Attributes – Cursor FOR loops – SELECT…FOR UPDATE – WHERE CURRENT OF clause – Exceptions – Types of Exceptions.

Unit V PL/SQL Composite Data Types and Named Blocks 10 h

PL/SQL Composite Data Types: PL/SQL Records – PL/SQL Tables – PL/SQL Varrays. Named Blocks: Procedures – Functions – Packages –Triggers.

Text Books

1 Nilesh Shah, 2016, "Database Systems Using ORACLE", 2nd Edition. PHI.

References

1 Arun Majumdar & Pritimoy Bhattacharya, 2007, "Database Management Systems", TMH.

2 Kevin Loney, George Koch, and the Experts at TUSC,2002, "Oracle 9i: The Complete Reference", TMH, Copy Right .

Course Code	Course Name	Category	L	T	P	Credit
224CT1A3CP	JAVA PROGRAMMING	CORE PRACTICAL	3	-	4	5

PREAMBLE

This course has been designed for students to learn and understand

- The object-oriented paradigm in the Java programming language.
- The multithreading, exception handling concepts.
- The swing programming and database concepts.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the fundamentals of Java Programming.	K2
CO2	Observe the basics and different types of Inheritance	K2
CO3	Acquire the knowledge in Packages, Exceptions concepts and String handling.	K3
CO4	Demonstrate Multithreading and Collections concepts.	K3
CO5	Apply Swing and JDBC concepts to create Java Applications.	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓			✓	✓
CO2	✓			✓	✓
CO3	✓		✓	✓	✓
CO4	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓

COURSE FOCUSES ON

✓	Skill Development		Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

224CT1A3CP	JAVA PROGRAMMING	SEMESTER III

Total Credits: 5

Total Instruction Hours: 36 L + 48 P h

Syllabus

Unit I Class and Methods 7 L h

Object Oriented Programming - Data types, Variable, Arrays, and Constants - Operators - Control statements. Class, Members, and Methods - Class instantiation - Access modifiers - Method overloading - Constructors - Static members and methods.

1. Program to understand class, methods and objects.
2. Program to implement method overloading.
3. Program to distinguish the different types of constructors.
4. Program to demonstrate static members and methods

Unit II Inheritance 7 L h

Inheritance: Basics - Types - Super keyword - Method overriding - Abstract class - Final methods and classes – Interfaces

5. Program to illustrate different types of inheritance.
6. Program to implement method overriding.
7. Program to demonstrate abstract class.
8. Program to defend multiple inheritance using interface.

Unit III Packages, Exceptions, and Strings 7 L h

Java built-in packages - User defined packages - Exception handling fundamentals - Built-in exceptions - User-defined exceptions - String handling using String, StringBuffer, and StringBuilder classes

9. Program to create user-defined package.
10. Program to implement exception handling.
11. Program to apply string handling functions.

Unit IV Multithreading and Collections 7 L h

Multithreading: Thread Life Cycle - Thread Creation - Thread Priorities. Collections overview - Collection Interfaces and Classes: Stack, Queue, ArrayList, LinkedList.

12. Program to demonstrate multithreading.

13. Programs to implement ArrayList.

14. Programs to implement (i) Stack (ii) Queue.

Unit V Swing and JDBC 8 L h

MVC architecture - Basics of Swing - Difference between AWT and Swing - Swing packages - A simple swing application - Event handling - Accessing databases with Java DataBase Connectivity (JDBC).

15. Develop a Swing application to manipulate student database records.

Text Books

1 Herbett Schildt, 2015, "Java: The Complete Reference", Ninth Edition, Tata McGraw-Hill Publishing Company Limited, New Delhi.

2 Paul Deitel and Harvey Deitel, 2015, "Java How to Program", Tenth Edition Deitel & Associates, Inc Publications.

References

1 E.Balaguruswamy, 2010, "Programming with Java A Primer", Second Edition, Tata McGraw Hill Publications.

2 Schildt, 2010, "The Complete Reference Java", Eighth Edition, Tata McGraw Hill Publications.

3 C. Xavier, 2010, "Programming with JAVA 2", SciTech Publication, Chennai.

4 Instructional Software Research and Development (ISRD) Group, 2007, "Introduction to Object Oriented Programming through Java", Tata McGraw-Hill Publishing Company Limited, New Delhi.

Course Code	Course Name	Category	L	T	P	Credit
224CS1A3CA	OPERATING SYSTEMS	CORE	3	-	-	3

PREAMBLE

This course has been designed for students to learn and understand

- The operations performed by OS as a resource manager.
- The various logical aspects of scheduling various processes.
- The mechanisms in memory and storage management.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the role of operating system with its function and services.	K2
CO2	Compute the waiting time and turnaround time using different process scheduling algorithms.	K3
CO3	Illustrate the methods for handling and preventing deadlocks.	K3
CO4	Apply the various mechanisms involved in memory management in contemporary OS.	K3
CO5	Allocate and deallocate memory space in secondary storages using scheduling methods.	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓				✓
CO2	✓				✓
CO3	✓		✓		✓
CO4	✓		✓	✓	✓
CO5	✓		✓	✓	✓

COURSE FOCUSES ON

✓	Skill Development		Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

224CS1A3CA	OPERATING SYSTEMS	SEMESTER III

Total Credits: 3

Total Instruction Hours: 36 h

Syllabus

Unit I Introduction to Operating Systems 6 h

Computer System Organization - Computer System Architecture - Operating System Structure - Distributed Systems - Open Source Operating Systems – Operating System Generation.

Unit II Process Scheduling 8 h

Process Concepts - Operations on Processes. Basic Concepts - Scheduling Criteria - Scheduling Algorithms: First-Come First-Served Scheduling - Shortest-Job-First Scheduling - Priority Scheduling - Round-Robin Scheduling - Multilevel Queue Scheduling. Synchronization: Background - The Critical - Section Problem - Semaphores.

Unit III Deadlocks 8 h

Deadlocks: Deadlock Characterization - Methods for Handling Deadlock - Deadlock Prevention - Deadlock Avoidance: Safe State - Resource-Allocation Graph Algorithm - Banker's Algorithm - Deadlock Detection - Recovery from Deadlock.

Unit IV Memory Management 8 h

Memory Management: Swapping - Contiguous Memory Allocation - Paging – Structure of Page Table - Segmentation. Virtual Memory: Demand Paging - Page Replacement: Basic Page Replacement - FIFO Page Replacement - Optimal Page Replacement - LRU Page Replacement.

Unit V Storage Management 6 h

Secondary-Storage Structure : Disk Structure - Disk Scheduling: FCFS Scheduling - SSTF Scheduling SCAN Scheduling-C-SCAN Scheduling-LOOK Scheduling-Selection of a Disk Scheduling Algorithm - RAID structure.

Case Studies: Linux System, Mobile Operating System.

Text Books

1 Silberschatz , Galvin , Gagne, 2018, "Operating System Concepts", 9th Edition, Wiley.

References

1 Andrew S. Tanenbaum, 2018,"Modern Operating Systems 4e", Pearson Education India.

2 Mukesh Singhal, Niranjan G. Shivaratri, 2019, "Advanced Concepts in Operaring System", 10th edition, McgrawHill.

3 William Stallings, 2017, "Operating Systems: Internals and Design Principles", 9th Edition, Pearson Education.

4 Herbert Bos, S.Tanenbaum, 2020,"Modern Operating System", 6th Edition Pearson education.

224CA1A3SP	SQL PROGRAMMING	SEMESTER III

Total Credits: 2
Total Instructions Hours: 48 h

S.No	Contents
1	Program to create DDL commands in SQL.
2	Program to create DML commands in SQL.
3	Program to create an employee table and perform the following SQL Queries Viewing all databases, creating a Database, viewing all Tables in a Database, Creating Tables (With and Without Constraints), Inserting/Updating/Deleting Records in a Table, Saving (Commit) and Undoing (rollback).
4	Program to perform different types of functions in SQL Number function Aggregate Function Character Function Conversion Function Date Function
5	Program to create different types of operators in SQL Arithmetic Operators Logical Operators Comparison Operator Special Operator Set Operation
6	Program to write a query for Sorting.
7	Program to Perform Join Operations on SQL Tables.
8	Program to Demonstrate SQL Sub Queries on Tables.
9	Program to create a View for a table in SQL.
10	Program to create Students Information table in PL/SQL to find the total, average marks and results of each student.

11	Program to demonstrate PL/SQL to show the uses of implicit cursor without using any attribute.
12	Program to implement PL/SQL to show the uses of explicit cursor without using any attribute.
13	Program to design a PL/SQL to prepare the Electricity Bill using Array.
14	Program to create a Trigger and perform the following Queries (Creation of insert trigger, delete trigger, update trigger).
15	Program to implement the concept of Packages using Procedure and Function.

Note: Out of 15 – 12 Mandatory

Course Code	Course Name	Category	L	T	P	Credit
225PA1A3IA	BUSINESS ACCOUNTING	CORE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- The rules of accounting used to enter the business transactions in a systematic manner to maintain books of accounts
- The procedures involved
- The concepts in preparation of accounts

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Know the book keeping concepts and conventions of accounting and rules of accounting and its types.	K1, K2
CO2	Capture the procedures relating to pass journal entries posting of ledger, trial balance and subsidiary books.	K2, K3
CO3	Obtain knowledge to prepare final accounts of a sole Trader.	K2
CO4	Know the consignment accounting and the theoretical aspect of joint venture.	K3
CO5	Classify and apply appropriate methods of depreciation.	K2, K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓		✓	✓
CO2		✓		✓	✓
CO3		✓		✓	
CO4		✓	✓	✓	✓
CO5	✓	✓			

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

225PA1A3IA	BUSINESS ACCOUNTING	SEMESTER III

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Fundamentals of Book Keeping 8 h

Fundamentals of Book Keeping: Definition, objectives, methods of accounting, Branches of accounting, Types of Accounts and Accounting rules – Accounting Concepts and Conventions – double entry system – advantage – difference between double entry and single entry

Case study on double entry system

Unit II Accounting Books 10 h

Journal, ledger, and Trial balance, subsidiary books – purchase book, sales books, purchase returns book, sales returns book and cash book with single, double and triple column cash book.

Unit III Final Accounts 10 h

Final Accounts of a sole trader - Trading Account, Profit and Loss Account and Balance Sheet with simple adjustments.

Case study on Final Accounts

Unit IV Accounting for consignments and Joint ventures 12 h

Accounting for consignments and Joint ventures: Consignment Meaning, definition, features, account sales, valuation of unsold stock, goods sent on consignment at cost price various commission to consignee (only Problem). Joint venture: Meaning, features, distinction between joint venture and partnership, joint venture and consignment. (Only Theory).

Unit V Depreciation 8 h

Depreciation - Meaning- Features- Methods- Straight Line Method– WDV Method - Annuity Method.

Case study on Depreciation methods

Note: Distribution of Marks: 80% problems and 20% theory.

Case studies related to the above topics to be discussed (Examined internal only)

Text Books

1 Vinayakam N., Mani P.L. and Nagarajan K.L,2019, "Principles of Accountancy", S.Chand& Company Ltd., New Delhi

2 Jain S P and Narang K L,2019, "Advanced Accountancy", Kalyani Publishers, New Delhi.

References

1 Gupta R.L., Gupta V.K. and Shukla M.C, 2006,"Financial Accounting", Sultan chand& sons, New Delhi.

2 Maheswari S.K., and Reddy T.S, 2005,"Advanced Accountancy", Vikas publishers, New Delhi

224CA1ASSA	SELF STUDY: PROGRAM LOGIC AND COMPUTER FUNDAMENTALS	SEMESTER III

Total Credits: 1

Syllabus

Unit I Introduction to Computer

Introduction to Computer – Computer System Hardware – Computer Memory.

Unit II Input and Output Devices

Input and Output Devices – Interaction of user and computer.

Unit III Programming Fundamentals and Internet

Computer Programming fundamentals – Internet and Internet services.

Unit IV Information Systems

Information Systems – Multimedia.

Unit V Ms Office

Ms-Word 2007 - Ms-Excel 2007 – Ms –Powerpoint 2007.

Text Books

1 Anita Goel, 2010,Computer Architecture, Pearson Publications, 1st Edition.

References

1 V. Rajaraman, 2014, "Fundamental of Computers", Prentice- Hall India Ltd., New Delhi.

2 Sinha P.K, 2007, "Computer Fundamentals", BPB Publications, New Delhi

3 Dubey, Manoj,2013, "P C Packages", Kamal Prakashan Publications, Indore.

224CA1ASSB	SELF STUDY : INTERNET TECHNOLOGIES	SEMESTER III

Total Credit: 1

Syllabus

Unit I Introduction

The Internet and Changing IT World - Internet Defined -A brief History of Internet - Administration of Internet - IT Foundations - The Internet and Technology Trends.

Unit II World Wide Web

The Development of the web - Key Web Technologies: URLs , HTTP and HTML -The Invisible Web -Web 2.0 - The Mobile Web -The Social Web -Virtualization ,Grids and Clouds - Using the Web

Unit III Network and Connection Technologies

Network Basics-The OSI Reference Model-Key Concepts and Terminology: Network Hardware – Wired Network Topologies – Wireless Networks – Protocols - Connecting to Internet –ISP, Modems, Analog Phone services, Broadband services.

Unit IV Internet Techonoloies

TCP/IP- UDP and ICMP - Higher Level Internet Protocols: Making the Internet Work- Email: SMTP, POP, IMAP - Protocols for information services - Gopher Protocol, HTTP Protocol.

Unit V Web Design and Graphics

Web Design Overview-Site Planning Typography and Fonts – Graphics and Color in Design.

Text Books

1 Joseph B. Miller , 2014 " Internet Technologies and Information services",ABC-CLIO, LLC , Second Edition,

References

1 Margaret Levine Young, Doug Muder, Dave Kay, Kathy Warfel , Alison Barrows, " Internet: The Complete Reference", McGraw-Hill.

9/6/23
BoS Chairman/HoD
Department of Computer Applications
Dr. N. G. P. Arts and Science College
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Dr.N.G.P. Arts and Science Co
APPROVED
BoS - 9.6.23 | AC - 14.7.23 | GB - 5.8.23

Course Code	Course Name	Category	L	T	P	Credit
221TL1A4TA	TAMIL - IV	LANGUAGE- I	3	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- மொழிப்பாடங்களின் வாயிலாக தமிழரின் பண்பாடு நாகரீகம், பகுத்தறிவு ஆகியவற்றை அறியச் செய்தல்
- கலை மற்றும் மரபுகளை அறியச் செய்தல்
- மாணவர்களின் படைப்பாக்கத்திறன்களை ஊக்குவித்தல்

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	வாழ்க்கைத் திறன்கள் (Life Skills)- மாணவர்களின் செயலாக்கத் திறனை ஊக்குவித்தல்	K3
CO2	மதிப்புக்கல்வி (Attitude and Value education)	K4
CO3	பாட இணைச்செயல்பாடுகள் (Co-curricular activities)	K4
CO4	சூழலியல் ஆக்கம் (Ecology)	K4
CO5	மொழி அறிவு (Tamil knowledge)	K5

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓			✓
CO2		✓			✓
CO3		✓			✓
CO4		✓			✓
CO5		✓			✓

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

221TL1A4TA	TAMIL - IV	SEMESTER IV

Total Credits: 3

Total Instruction Hours: 48 h

Syllabus

Unit I **எட்டுத்தொகை** 10 h

1. நற்றிணை - குறிஞ்சித் திணை
   I.பா.எண் : 01 – கபிலர்
   II.பா.எண் : 88 – நல்லந்துவனார்
   III.பா.எண் : 102 – செம்பியனார்
2. குறுந்தொகை - முல்லைத்திணை
   I.பா.எண் : 65 – கோவூர்கிழார்
   II. பா.எண் : 167 – கூடலூர்கிழார்
   மருதத்திணை
   I.பா.எண் : 08 – ஆலங்குடி வங்கனார்
   II.பா.எண் : 61 – தும்பிசேர்கீரனார்
   III.பா.எண் :196 – மிளைக் கந்தன்
   நெய்தல் திணை
   I.பா.எண் : 57 – சிறைக்குடி ஆந்தையார்

Unit II **எட்டுத்தொகை** 08 h

1. கலித்தொகை – பாலைக்கலி
   I.பா.எண் : 09 - பெருங்கடுங்கோ
2. அகநானூறு – மருதத்திணை
   I.பா.எண் : 86 – நல்லாவூர்கிழார்
3. புறநானூறு - I.பா.எண் : 188 - பாண்டியன் அறிவுடை நம்பி
   II.பா.எண் : 192 – கணியன் பூங்குன்றனார்
   III.பா.எண் : 279 – ஒக்கூர் மாசாத்தியார்
   IV.பா.எண் : 312 – பொன்முடியார்

Unit III **பத்துப்பாட்டு** 10 h

1. பட்டினப் பாலை – கடியலூர் உருத்திரங் கண்ணனார் -1முதல் 218 வரிகள் வரை மட்டும்.

Unit IV **இலக்கிய வரலாறு** 10 h

1. எட்டுத் தொகை நூல்கள்
2. பத்துப்பாட்டு நூல்கள்

Unit V **இலக்கணம் மற்றும் திறனாய்வுப் பகுதி** 10 h

I.இலக்கணம்
   1. அகத்திணை - அன்பின் ஐந்திணை - விளக்கம்
   2. புறத்திணை - 12 திணைகள் - விளக்கம்

II.பயிற்சிப் பகுதி
சங்கப் பாடல்கள் குறித்து திறனாய்வு செய்தல்

Note: பயிற்சிப் பகுதியில் வினாக்கள் அமைத்தல் கூடாது

Text Book

1 செய்யுள் திரட்டு - மொழிப் பாடம் - 2022- 23
தொகுப்பு: தமிழ்த்துறை, டாக்டர் என்.ஜி.பி. கலை அறிவியல் கல்லூரி, வெளியீடு : நியூ செஞ்சுரி புக் ஹவுஸ், சென்னை – 600 098. (Unit I- V)

References

1 பேராசிரியர் புலவர் சோம. இளவரசு, எட்டாம் பதிப்பு -2014, தமிழ் இலக்கிய வரலாறு - மணிவாசகர் பதிப்பகம், சென்னை.
2 பேராசிரியர் முனைவர் பாக்கியமேரி, முதற் பதிப்பு- 2013, இலக்கணம் -இலக்கிய வரலாறு - மொழித்திறன் -பூவேந்தன் பதிப்பகம், சென்னை.
3 தமிழ் இணையக் கல்விக்கழகம்.<http://www.tamilvu.org/>

Course Code	Course Name	Category	L	T	P	Credit
221TL1A4HA	HINDI - IV	LANGUAGE- I	3	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature
- the techniques for expansion of ideas and translation process

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the fundamentals of novels and stories	K1
CO2	Understand the principles of translation work	K2
CO3	Expose the knowledge writing critical views on fiction	K2
CO4	Build creative ability	K3
CO5	Apply the power of creative reading	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓			✓
CO2		✓			✓
CO3		✓			✓
CO4		✓			✓
CO5		✓			✓

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

221TL1A4HA	HINDI- IV	SEMESTER IV

Total Credits: 3

Total Instruction Hours: 48 h

Syllabus

Unit I 10 h

नाटक

Unit II 10 h

एकांकी

Unit III 10 h

काव्य मंजरी

Unit IV 10 h

सूचना लेखन

Unit V 08 h

अनुवाद अभ्यास- III

Text Books

1. लडाई – सर्वेश्वरदयाल सक्सेना प्रकाशक: वाणी प्रकाशन 21-A, दरियागंज नई दिल्ली-110002. (Unit I)
2. एकांकी पंचामृत – डॉ राम कुमार (भोर और तारा छोड्कर) प्रकाशक: जवाहर पुस्तकालय सदर बाजार, मथुरा उत्तर प्रदेश-281001. (Unit II)
3. काव्य मंजरी- (डा मुन्ना तिवारी) मैथिलीशरण गुप्त- मनुष्यता, जयशंकर प्रसाद- बीती विभावरी जागरी सूर्यकान्त त्रिपाठी निराला- तोडती पत्थर और भिक्षुक. (Unit III)
4. सूचना लेखन पुस्तक: व्याकरण प्रदिप – रामदेव प्रकाशक: हिन्दी भवन 36 इलाहाबाद -211024. (Unit IV)
5. अनुवाद अभ्यास (केवल अंग्रेजी से हिन्दी में) (पाठ 10 to 20) प्रकाशक: दक्षिण भारत प्रचार सभा चेनैई -17 (पाठ10 to 20). (Unit V)

Course Code	Course Name	Category	L	T	P	Credit
221TL1A4MA	MALAYALAM- IV	LANGUAGE - I	3	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- the writing ability and develop reading skill
- the various concepts and techniques for criticizing literature, to learn the techniques for expansion of ideas and translation process
- the competency in translating simple Malayalam sentences into English and vice versa

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the fundamentals of novels and stories	K1
CO2	Understand the principles of translation work	K2
CO3	Expose the knowledge writing critical views on fiction	K2
CO4	Build creative ability	K3
CO5	Apply the power of creative reading	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓			✓
CO2		✓			✓
CO3		✓			✓
CO4		✓			✓
CO5		✓			✓

COURSE FOCUS ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

221TL1A4MA	MALAYALAM- IV	SEMESTER IV

Total Credits: 3

Total Instruction Hours: 48 h

Syllabus

Unit I **Drama** 10 h

Saketham- Sreekandan Nair

Unit II **Drama** 10 h

Saketham- Sreekandan Nair

Unit III **Drama** 10 h

Saketham- Sreekandan Nair

Unit IV **Screen Play** 10 h

Perumthachan- Vasudevan Nair

Unit V **Screen Play** 08 h

Perumthachan- Vasudevan Nair

Text Books

1 Nair, Sreekandan C.N. 2023. Saketham, Drama. DC Books Kottayam, Kerala, India. (Unit I to III)

2 Nair, Vasudevan M.T. 1994. Perumthachan- Screenplay. DC Books Kottayam, Kerala, India. (Unit IV & V)

Reference

1 Sankarapillai. 2005. Malayala Nataka Sahithya Charithram, Kerala Sahithya Akademi Publishers, Kerala, India.

Course Code	Course Name	Category	L	T	P	Credit
221TL1A4FA	FRENCH - IV	LANGUAGE- I	3	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- the Competence in General Communication Skills – Oral + Written- Comprehension & Expression
- the Culture, life style and the civilization aspects of the French people as well as of France
- the students to acquire Competency in translating simple French sentences into English and vice versa

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the Basic verbs, numbers and accents	K1
CO2	Apply the adjectives and the classroom environment in France	K2
CO3	Select the Plural, Articles and the Hobbies	K2
CO4	Measure the Cultural Activity in France	K3
CO5	Evaluate the sentiments, life style of the French people and the usage of the conditional tense	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓			✓
CO2		✓			✓
CO3		✓			✓
CO4		✓			✓
CO5		✓			✓

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

221TL1A4FA	FRENCH - IV	SEMESTER IV

Total Credits: 3
Total Instruction Hours: 48 h

Syllabus

Unit I 10 h

°Décrirequelqu'un. ° Comparer	En milieu professional, recruiter quelquún et justifier sonchoix.	S'exprimersur les styles de vêtemantReconnaitre des personnes à partit de descriptions.	Comprendre la description de personnesdans un extrait de roman.

Unit II 10 h

ExprimerPaccord ou le désaccord. ° Se situerdans le temps.	En milieu professional, recruiter quelquún et justifier sonchoix.	Décrire des personnes. Comprendre des personnes qui experiment leur accord ouleurdésaccord.	Comprendre des différences de points de vueexprimétesdans de message électronique. Raconter unsourvenir.

Unit III 10 h

° Parler de Pavenir.	Discuter de l'organisation d'un voyage de groupepuisprépar erune fiche projet et la templit.	Comprendreune chanson. Echangersursesprojets de vacancy	Comprendre le message d'une carte d'anniversaire

Unit IV 10 h

° Exprimer des souhaits. ° Décrirequelq u'u n	Discuter de l'organisation d'un voyage de groupepuisprépar erune fiche projet et la templit.	Discuter du programme de la soire à venir. Addresser des souhaits à quelqu'un.	Comprendre le message d'une carte d'anniversaire

Unit V 08 h

Make in Own Sentences based on the above Lessons

Text Book

1 LATITUDES 1 (Méthode de français) Pages from 128-151, Author : Regine Mérieux, Yves Loiseau (Unit I to IV)

Course Code	Course Name	Category	L	T	P	Credit
221EL1A4EA	PROFESSIONAL ENGLISH - IV	LANGUAGE- II	3	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- the skill-based learning for better communication
- the prevalent issues logically and present coherently
- the ideas accurately and clearly

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Develop the ability to appreciate ideas and think critically	K1
CO2	Integrate academic success into practical life skills	K2
CO3	Express challenges of a competitive environment and select the profession that best suits them	K2
CO4	Discuss with confidence in conversations, to initiate, sustain and close a conversation	K3
CO5	Identify a sense of social commitment	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓			✓
CO2		✓			✓
CO3		✓			✓
CO4		✓			✓
CO5		✓			✓

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights	✓	Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

221EL1A4EA	PROFESSIONAL ENGLISH - IV	SEMESTER IV

Total Credits: 3

Total Instruction Hours: 48 h

Syllabus

Unit I Career 08 h

Leadership- Everyday leadership- Everyday leaders motivation- Qualities of a good leader- Professionalism- Creativity- Practical Application- Ways to become more creative- Six Thinking hats techniques

Unit II Art of Promoting 11 h

Selling your skills- Neuromarketing as a tool for influencing leaders- Using neuromarketing and psychology to get ahead- Recruiters and Clients decision making skills- Three steps to use neuromarketing for a successful life- Attention- storytelling- Perception and reputation- Recognize opportunities and openings before the competition- observation– Matching yourself with your leaders

Unit III Facing Challenges 10 h

Introduction-Panicky people- Negative people- Positive people- Facing challenges and taking initiatives – Importance of youth to face challenges and take initiative Benefits of Facing challenges- Facing challenges in life

Unit IV Effective Decision Making 10 h

Decision Making Process- Methods of Decision Making- Steps in DM- Theoretical Approaches to individual Decision Making- Optimizing Decision Theory- The Subjective Expected Utility Model- Steps to Effective Decision- Making- Effective Decision Making in Terms- Methods for team decision making- Confusion and decision making- Decision making styles

Unit V Practising Corporate Social Responsibility (CSR) 09 h

Corporate Social Responsibility (CSR)- definitions- Goal- Areas- Need- Benefits - Argument in favour/against of CSR- Factors that promote CSR – Limitations for implementing- India and Corporate Social Responsibility- Activities carried out by Companies in India- List of projects for funding under CSR- Implementation of CSR commitments

Text Books

1. Sharma, Prashant. 2022. Soft Skills. BPB Publications, 3rd Edition, New Delhi, India. (Unit I & II)
2. Alex. 2013. Managerial Skills. S. Chand Publishing, New Delhi, India. (Unit III to V)
3. Alex. 2009. Soft Skills. S. Chand Publishing, New Delhi, India. (Unit II)
4. E H McGrath S J. 2011. Basic Managerial Skills for All, 9th Edition, New Delhi, India. (Unit III)

References

1. Adair J. 1986. Effective Team Building: How to make a winning team. Pan Books, London, United Kingdom.
2. Dhanavel S P. 2010. English and Soft Skills, Orient Blackswan, Hyderabad, India.
3. Singh S R. 2011. Soft Skills. APh Publishing Corporation, New Delhi, India.
4. Lakshminarayanan K R, Murugavel T. 2015. Managing Soft Skills. Scitch Publications, Chennai, India.

Course Code	Course Name	Category	L	T	P	Credit
224CT1A4CA	COMPUTER NETWORKS	CORE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- The basic networking concepts, reference models
- Acquire knowledge on various layers and their functionalities
- The networking protocols used in the layers

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Describe the working of OSI and TCP/IP Reference Model and the services offered by physical layer.	K2
CO2	Interpret the design Issues of Data Link Layer and the protocols used in data link layer	K2
CO3	Illustrate the Routing Algorithms in network layer and perspective of it over the internet	K2
CO4	Identify the services provided by transport layer to upper layers and differentiate TCP and UDP Protocols	K2
CO5	Explain the different protocols used at application Layer and functions of application layer.	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓		✓		✓
CO2	✓		✓	✓	✓
CO3	✓		✓	✓	✓
CO4	✓	✓	✓		✓
CO5	✓		✓		✓

COURSE FOCUSES ON

✓	Skill Development		Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

224CT1A4CA	COMPUTER NETWORKS	SEMESTER IV

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Introduction 10 h

Introduction - Uses of Computer Networks - Types of Computer Networks: Broadband Access Networks - Mobile and Wireless Access Networks - Content Provider Networks - Transit Networks - Enterprise Networks. Network Technology - Examples of Networks - Network Protocols.

Reference Model: The OSI Reference Model - TCP/IP Reference Model.

Physical Layer: Guided Transmission Media - Wireless Transmission - Digital Transmission - Using the Spectrum for Transmission - Radio Transmission - Microwave Transmission

Unit II Data Link Layer 10 h

Data Link Layer Design Issues: Services provided to the Network Layer - Framing -Error Control - Flow Control - Error Detection and Correction.

Elementary Data Link Protocols: Basic Transmission and Receipt - Simplex Link-Layer Protocols - Improving Efficiency.

Data Link Protocols in Practice: The Medium Access Control Sublayer: Multiple Access Protocols - Ethernet - Wireless LANs - Bluetooth - Data Link Layer Switching: Repeaters, Hubs, Bridges, Switches, Routers, and Gateways.

Unit III Network Layer 10 h

Network Topologies - Network Layer Design Issues - Routing Algorithms: Shortest Path Algorithm - Distance Vector Routing.

Quality of Service and Application: Packet Scheduling - Integrated Services - Differentiated Services. Software-Defined Networking: The SDN Control Plane - The SDN Data Plane.

The Network Layer in the Internet: The IP Version 4 Protocol - IP Addresses - IP Version 6 - Internet Control Protocols.

Unit IV Transport Layer 10 h

The Transport Service: Services provided to the upper layers – Transport Service Primitives - Berkeley Sockets - Elements of Transport Protocols - Congestion Control.

The Internet Transport Protocols: UDP – Remote Procedure Call - Real-Time Transport Protocols. TCP: TCP Service Model - TCP Protocol – TCP Segment Header - TCP Connection Establishment and Release – TCP Sliding Window - TCP Congestion Control

Unit V The Application Layer 8 h

The DNS: The DNS Lookup Process - The DNS Name Space and Hierarchy - Name Resolution - Electronic Mail: Architecture and Services – Message Formats - Message Transfer. The World Wide

Web: Architectural Overview - HTTP and HTTPS - Content Delivery Networks - Peer-to-Peer Networks.

Text Books

1 Andrew S.Tanenbaum, Nick Feamster, David J.Wetherall, 2022, "Computer Networks", Sixth Edition ,Pearson

References

1 William Stallings, 2018, "Data and Computer Communications", Tenth Edition, Pearson Education.

2 James F. Kurose, Keith W.Ross, 2021, "Computer Networking A Top-Down Approach", Pearson.

Course Code	Course Name	Category	L	T	P	Credit
224CA1A4EP	PYTHON PROGRAMMING	EMBEDDED PRACTICAL	3	-	4	5

PREAMBLE

This course has been designed for students to learn and understand

- The fundamentals of python.
- The function-oriented programming paradigm in python.
- The implementation of various applications using python.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic concepts of Python Language.	K1
CO2	Build skills to work with functions and modules.	K2
CO3	Obtain knowledge to manipulate strings, lists, tuples, sets and dictionaries.	K2
CO4	Apply Numpy library operations on array.	K3
CO5	Apply the fundamentals of the Pandas library.	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓			✓	✓
CO2	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

224CA1A4EP	PYTHON PROGRAMMING	SEMESTER IV

Total Credits: 5

Total Instruction Hours: 36 L + 48 P h

Syllabus

Unit I Basics of Python Programming and Decision Control Statements 7 L + 9 P h

Features of Python-Literal Constants-variables and Identifiers-Data Types-Input Operation-Comments-Indentation-Operators and Expressions-Other Data types – Type Conversion.

Decision Control Statements: Selection/Conditional Branching Statements-Basic Loop Structures/Iterative Statements-Nested Loops-The Break Statement-The Continue Statement-The pass Statement -The else statement used with Loops.

Practical

1.Python Program to Demonstarte Operators

2. Python program to Evaluate Expression

3.Python Program to illustrate decision statements

4.Python Program using Repetitive Statements

Unit II Functions and Modules 7 L + 9 P h

Function Definition- Function Call-Variable Scope and life Time-Return Satements- More on Defining Functions-Lambda Functions-Recursive Functions-Modules-Packages in Python

Practical

5. Python Program to Illustrate User defined functions

6. Python program to Demonstrate Lamda function

7. Python Program to demonstrate Recursive

Unit III Python Strings and Data Structures 8 L + 10 P h

Concatenating, Appending and Multiplying Strings-Formatting Operators- Bulit-in- string Methods and Functions – Slice Operation- in and not-in Operators- comparing String-Itearting String - Data Structures: Sequence- Lists- Functional Programming-Tuple-Sets-Dictionaries.

Practical

8. Python program to demonstrate String operations

9. Python Program to implement Lists

10. Python program to implement Tuples

11. Python Program to implement Sets

12. Python Program to implement Dictionaries

Unit IV NumPy Library — 7 L + 10 P h

The NumPy Library: NumPy : A Little History - The NumPy Installation - Ndarray: The Heart of the Library - Basic Operations - Indexing, Slicing and Iterating - Conditions and Boolean Arrays - Shape Manipulation - Array Manipulation - Structured Arrays - Reading and Writing Array Data on Files.

Practical

13.Python Program for Basic Operations in ND array

14. Python Program to implement Structured Array

Unit V Pandas] — 7 L + 10 P h

Pandas: The Python Data Analysis Library: Pandas Data Structures - Other Functionalities on Indexes - Operations between Data Structures - Function Application and Mapping - Sorting and Ranking - "Not a Number" Data. Pandas: Reading and Writing Data: CSV and Textual Files - Reading Data in CSV or Text Files - Reading and Writing HTML Files.

Practical

15.Python Program for Sorting and Ranking

16.Python Program to read CSV files

17.Python program to read and write HTML Files

Text Books

1 Reema Thareja, 2020, "Python Programming using Problem Solving Approach", oxford University Press, 1st Edition. [Unit- 1,2 and 3].

2 Fabio Nelli , 2015, "Python Data Analytics" , Apress, 1st Edition. [Unit- 4 and 5].

References

1 Wes McKinney,2017,"Python for Data Analysis: Data Wrangling with Pandas, NumPy, and IPython", O'Reilly Media, Inc., 2nd Edition.

2 Dipanjan Sarkar,Raghav Bali,Tushar Sharma, 2018,"Practical Machine Learning with Python", Apress, 1st Edition

3 S.A. Kulkarni,2018,"Problem Solving and Python Programming,Yes Dee Publishing Pvt Ltd., 2nd Edition

4 www.spoken-tutorial.org.

Course Code	Course Name	Category	L	T	P	Credit
224CA1A4CB	CYBER SECURITY	CORE	3	-	-	3

PREAMBLE

This course has been designed for students to learn and understand

- To create awareness about Cyber crime and Cyber offences in day -to-day operations.
- To secure Mobile and Wireless devices from cyber attacks.
- To illustrate the Legal perspectives regarding cyber crime and cyber security.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the basics of cybercrime.	K1
CO2	Know how criminals plan Cyber offenses.	K2
CO3	Outline cybercrime in Mobile and Wireless Devices.	K2
CO4	Illustrate the tools and Methods used in cybercrime.	K2
CO5	Outline cybercrime and cyber security Legal perspectives.	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1		✓			✓
CO2					✓
CO3	✓		✓	✓	✓
CO4		✓	✓	✓	✓
CO5					✓

COURSE FOCUSES ON

✓	Skill Development	☐	Entrepreneurial Development
✓	Employability	✓	Innovations
	Intellectual Property Rights		Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

224CA1A4CB	CYBER SECURITY	SEMESTER IV

Total Credits: 3

Total Instruction Hours: 36 h

Syllabus

Unit I Introduction to Cybercrime 7 h

Cybercrime and Information Security – Who are Cybercriminals – Classification of Cybercrimes :E-Mail Spoofing , Spamming, Cyberdefamation, Internet Time Theft, Salami Attack, Data Diddling, Forgery, Web Jacking, Newsgroup Spam, Industrial Spying, Hacking, Online Frauds, Pornographic Offenses, Soft Piracy, Computer Sabotage, E-Mail Bombing, Computer Network Intrusions, Password Sniffing, Credit Card Frauds, Identity Thefts.

Unit II Cyber offenses: How Criminals Plan them? 8 h

Categories of Cybercrime – How Criminals Plan the Attack?: Reconnaissance, Passive Attacks, Active Attacks, Scanning and Scrutinizing Gathered Information, Attack(Gaining and Maintaining the System Access) – Social Engineering: Classification of Social Engineering – Cyberstalking: Types of Stalkers, How Stalking works? - Cybercafe and Cybercrime.

Unit III Cybercrime: Mobile and Wireless Devices 7 h

Proliferation of Mobile and Wireless Devices – Credit card Frauds in Mobile and Wireless Computing Era- Security Challenges Posed by Mobile Devices - Registry Settings for Mobile Devices – Authentication Service Security – Attacks on Mobile Phones –Laptops: Physical Security Counter Measures.

Unit IV Tools and Methods Used in Cybercrime 7 h

Proxy Servers and Anonymizers – Phishing – Password Cracking – Keyloggers and Spywares – Virus and Worms – Trojan Horses and Backdoors – Steganography – DoS and DDoS Attacks – SQL Injection – Buffer Overflow – Attacks on Wireless Networks.

Unit V Cybercrimes and Cybersecurity: The Legal Perspectives 7 h

The Indian IT Act – Challenges to Indian Law and Cybercrime Scenario in India – Digital Signatures and the Indian IT Act – Amendments to the Indian IT Act – Cybercrime and Punishment. Case studies: E-mail spoofing Instances, Indian case of Online Gambling.

Text Books

1 Nina Godbole and Sunita Belapure, "Cyber Security – Understanding Cyber Crimes, Computer Forensics and Legal Perspectives" Reprint 2022, Wiley India Pvt Ltd.

References

1 Mayank Bhushan, Rajkumar Singh Rathore and Aatif Jamshed, 2017, Fundamentals of Cyber Security, BPB Publications, 1st Edition.

224CA1A4SP	BIG DATA TECHNOLOGIES	SEMESTER IV

Total Credits: 2
Total Instructions Hours: 48 h

S.No	Contents
1	**Cassandra** 1. Design Data Models in Cassandra. 2. Execute Table Creation in Cassandra. 3. Perform Time to Live (TtL) in Cassandra. 4. Implement Import and Export to. Csv in Cassandra. 5. Create Counter in Cassandra.
2	**Hadoop** 1.Start the Hadoop. 2.Check whether all the Hadoop daemons are running. 3.Check the number of files in the root directory. 4.Check the size of space in the root directory. 5.Create a new named directory. 6.Create a new text file in the directory. 7.Move the text file from HDFS to local file system. 8.Remove the directory in HDFS.
3	**PIG** 1.Pig program to perform Word Count Operation. 2.Pig Script to Load Data.
4	**Hive** 1.Creating tables in Hive (Internal & External Tables). 2.Data lake preparation activity in hive. 3.Hive commands to create an internal table.
5	**HBASE** 1. Implement Data model of HBase. 2. Perform basic CRUD operations in HBase. 3. Perform Bulk Loading data into HBase.

R Programming

6

1.Data Types in R

2.Built in Functions in R

3.Vector Manipulation in R

4.Data Frames in R

5.Mathematical Operations Using Built-in Function

6.Matrix Using R Script

7.Data Visualization and Plotting Techniques

Course Code	Course Name	Category	L	T	P	Credit
222MT1A4IC	OPERATIONS RESEARCH	IDC	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- the Mathematical formulation of LPP
- the method of finding optimized solutions for transportation and assignment problems
- the concept and applications of decision theory and networks

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	identify the feasible solution using Graphical method	K1
CO2	illustrate the optimality analysis in Transportation problem	K2
CO3	illustrate the concept behind the travelling salesman problem	K2
CO4	compare various strategies and identify appropriate one	K3
CO5	estimate the project duration for the shortest path using CPM and PERT	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1			✓		✓
CO2			✓	✓	✓
CO3			✓	✓	✓
CO4			✓	✓	✓
CO5			✓	✓	✓

COURSE FOCUSES ON

✓	Skill Development		Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

222MT1A4IC	OPERATIONS RESEARCH	SEMESTER IV

Total Credits:

Total Instruction Hours: 48 h

Syllabus

Unit I Linear Programming Problem 9 h

Definition - Basic requirements -assumptions - advantages and drawbacks - general model of LPP - application areas - formulation-examples-Graphical method- some special cases in LPP.

Unit II Transportation Problem 9 h

Formulation- solution procedure - methods for finding initial solution- test for optimality-variations -sensitivity analysis-prohibited and preferred routes - transhipment problem.

Unit III Assignment Problem 10 h

Mathematical model of assignment problem-solution methods-assignment algorithm-special variations -restrictions on assignments.

Unit IV Decision Analysis 10 h

Few management applications - ingredients of decision problem- types - Bayesian decision rule-Posterior analysis - decision tree analysis.

Unit V Project Network Analysis 10 h

Development of network analysis concept -developing the project network - critical path analysis - critical path method- programme evaluation and review technique - analysis of time cost relationship -resource allocation.

Text Books

1 Kapoor V K, 2022, "Operations Research: Quantitative Techniques for Management", Ninth Edition, Sultan Chand and Sons Educational Publishers, New Delhi

References

1. Kanti Swarup, Gupta P K and Man Mohan, 2007, "Operations Research" Fifth Edition, S. Chand & Sons Education Publications, New Delhi
2. Gupta P K, Hira D S, 2014, "Operations Research", Seventh Edition, S. Chand & Company Pvt. Ltd, New Delhi
3. Hamdy A Taha, 2014, "Operations Research: An Introduction", Nineth Edition, Pearson Education Publishers Private Limited, New Delhi
4. Gupta P K and Gupta S P, 2014, "Quantitative Techniques & Operations Research", Sultan Chand and Sons, New Delhi

16/10/23
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Course Code	Course Name	Category	L	T	P	Credit
224CA1A5CA	ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS	CORE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- The categories of AI Techniques.
- Assess the concepts of Heuristic Search techniques and Knowledge Representation.
- Acquire knowledge of Generative AI and Expert Systems.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn Conceptual framework for Artificial intelligence Technique.	K1
CO2	Understand key concept of Searching process. Classify differentapproach for issues in knowledge representation.	K2
CO3	Make use of Predicate Logic.	K3
CO4	Acquire knowledge about Generative AI Applications.	K3
CO5	Apply procedural and declarative rules for acquiring knowledge in expert system.	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓				
CO2	✓	✓			
CO3	✓	✓	✓		
CO4	✓		✓	✓	
CO5	✓		✓	✓	✓

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

224CA1A5CA	ARTIFICIAL INTELLIGENCE AND EXPERT SYSTEMS	SEMESTER V

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Introduction to Artificial Intelligence 8 h

AI Problems – AI techniques – The level of the model - Criteria for success. Problems, Problem Spaces and Search: Problem as a State Space Search – Production Systems – Problem Characteristics – Issues in design of Search programs – Additional Problems.

Unit II Heuristic Search techniques 8 h

Generate and Test – Hill Climbing – Best-First Search - Problem Reduction - Constraint Satisfaction- Means-end analysis.

Knowledge Representation: Knowledge representation issues - Representations and mappings – Approaches to Knowledge representations – Issues in Knowledge representation - The Frame Problem.

Unit III Using Predicate Logic 8 h

Representing simple facts in logic – Representing Instance and Isa relationships – Computable functions and predicates – Resolution – Natural deduction.

Unit IV Generative AI 12 h

Introduction – Definition – Using Generative AI - Dangers of Hype- Data: The fuel of Generative AI - Generative AI for Data Wrangling - Generative AI for Data Preparation.

AI Fundamentals: Understanding the Core Foundations of Generative AI - Understanding the concept of AI- AITools - The Brain and AI- AI Systems for Beginners.Core Generative AI Technology: Generative vs. Discriminative Models - Probability Theory -Types of Generative AI Models- DALL-E 2.

Unit V Representing knowledge using rules 12 h

Procedural Vs Declarative knowledge – Logic programming – Forward Vs Backward reasoning – Matching – Control knowledge.

Brief explanation of Expert Systems-Definition- Characteristics-architecture- Knowledge Engineering- Expert System Life Cycle-Knowledge Acquisition Strategies- Expert System Tools.

Text Books

1 Elaine rich and Kelvin Knight, 1991, "Artificial Intelligence", Tata McGraw Hill Publication, 2nd Edition.

2 Tom Taulli Monrovia, 2013,"Generative AIHow ChatGPT and Other AI Tools will Revolutionize Business", Apress.

References

1 Stuart J.Russell and Peter Norvig, 2009, "Artificial Intelligence - A Modern Approach", Pearson Education Inc., Second Edition.

2 George F Luger, 2002, "Artificial Intelligence",Tata McGraw Hill Publication, 4th Edition.

3 V S Janaki Raman, K Sarukesi, P Gopalakrishnan, 2010,"Foundations of Artificial Intelligent and Expert Systems", MacMillan India limited.

Course Code	Course Name	Category	L	T	P	Credit
224CA1A5CB	C# PROGRAMMING	CORE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- The objectives of the .Net Framework
- About the programming methodologies of C#.Net
- Develop window applications, database connectivity and web applications

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the C#.Net framework	K1
CO2	Illustrate generic control structures and arrays regulatory functions	K2
CO3	Implements the additional features in C#.Net	K3
CO4	Develop the knowledge of generic and advanced control in windows applications	K2
CO5	Expose the concepts of database connectivity and server side controls	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓				✓
CO2	✓			✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓	✓
CO5	✓		✓	✓	✓

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

224CA1A5CB	C# PROGRAMMING	SEMESTER V

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Introduction to Visual C#.Net 9 h

Introduction-.Net Framework-.Net Base Classes VC#.Net Language-Development and Execution of a simple VC#.Net Program in the Command Prompt Window.

Features in Visual Studio.Net: Start page - Solution Explorer Window-Class View window - Object Browser-Code Window. Data Types and Console I/O: Value types and Reference types - Boxing and Unboxing-variable declaration and Initialization-Data type conversion-Console I/O functions.

Unit II Control Statement 9 h

Foreach statement – Goto statement. Arrays and Methods: One-dimensional arrays - Two-dimensional arrays – Jagged array – array and Array list Classes – Methods – value Type parameters – out Type parameters – params Type parameters – method overloading. Classes and Objects-Properties, Indexers and Operator Overloading-Inheritance and Polymorphism.

Unit III Interface 10 h

Interfaces, Namespaces and Components – Delegates, Events and Attributes – Exception Handling.

Unit IV Window Applications 10 h

Classes used in windows applications - Textbox and Label controls- Button – checkbox – radio button – group box – list box – checked list box – combo box – calendar control – docking – progress bar – track bar – panel – tree view – splitter – menu – dialog boxes – toolbar - status bar.

Unit V Database and web applications 10 h

Database connectivity Database connectivity – Basic web controls: Advantages of ASP.Net-ASP.Net Object Model – server-side controls – server-side processing of client-side events-Calendar controls-Adrotator control. Validation and list web controls.

Text Books

1 Muthu .C, 2007, "Visual C# .Net", 1st Edition, Vijay Nicole Publication, Chennai.

References

1 Balagurusamy. E, 2010, "Programming in C# A Primer", 3rd Edition, Tata McGraw Hill. India.

2 Matt Telles, 2008, "C# Programming" - Black Book, Dreamtech Press, New Delhi.

Course Code	Course Name	Category	L	T	P	Credit
224CA1A5CC	SOFTWARE ENGINEERING CONCEPTS	CORE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- To provide knowledge in the development of software system of high quality.
- To be able to work with software development within different industrial sectors.
- To learn about the systematic approach to the design, development, operating and maintenance of quality software products.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the systematic approach of software process.	K1
CO2	Illustrate the Agile development.	K2
CO3	Translate the systematic approach to design, development of software systems.	K2
CO4	Apply software testing strategies.	K3
CO5	Implement software quality and maintenance.	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓			✓	✓
CO2	✓			✓	✓
CO3	✓				✓
CO4	✓	✓		✓	✓
CO5	✓			✓	✓

COURSE FOCUSES ON

✓	Skill Development		Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

224CA1A5CC	SOFTWARE ENGINEERING CONCEPTS	SEMESTER V

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Software Engineering and Process Models 10 h

Introduction –The Nature of Software – Unique Nature of Web Apps – Software Engineering – The Software Process - Software Engineering Practice.

Process Models: A Generic Process Model - Process Assessment and Improvement – Prescriptive Process Models – Specialized Process Models – The Unified Models.

Unit II Agile Development 8 h

Agility - Agility and Cost of Change - Agile Process - Extreme Programming - Agile Process Models.

Unit III Software Requirement Analysis and Software Design 10 h

Requirements Analysis and Specification: Requirements Gathering and Analysis – Software Requirements Specification (SRS) – Formal System Specification.

Function-Oriented Software Design: Overview of SA/SD Methodology – Structured Analysis – Data Flow Diagram (DFDs) – Structured Design - Detailed Design – Design Review.

Unit IV Coding and Testing 10 h

Coding and Testing: Coding – Code Review – Software Documentation - Testing – UNIT Testing – Black-Box Testing – White-Box Testing – Debugging – Program Analysis Tools – Integration Testing – System Testing.

Unit V Software Quality and Maintenance 10 h

Software Reliability and Quality Management: Software Reliability – Statistical Testing – Software Quality – Software Quality Management System – ISO 9000.

Software Maintenance: Characteristics of Software Maintenance – Software Reverse Engineering – Software Maintenance Process Models – Estimation of Maintenance Cost. Software Reuse: Introduction – Issues in any Reuse Program – Reuse Approach – Reuse at Organization Level.

Text Books

1 Rajib Mall, 2018,"Fundamentals of Software Engineering", Prentice Hall of India Private Limited, 5th Edition.

2 Roger S Pressman,2014,"Software Engineering", MC Graw-Hill, 7th Edition

References

1 Ian Sommerville, 2014, "Software Engineering", Pearson,9th Edition

2 Stephen Schach , 2010,"Software Engineering", TMH, 7th edition..

224CA1A5CP	CORE PRACTICAL : SOFTWARE TESTING	SEMESTER V

Total Credits: 2
Total Instructions Hours: 48h

S.No	List of Experiments
1	Prepare test case based on controls.
2	Implement Test data in a flat file.
3	Perform Manual test case to verify student grade.
4	Create a program and prepare test case to select the number of students those who have scored more than 60 in any one subject (or all subjects).
5	Write and test a program to login a specific web page.
6	Write and test a program to get the number of list items in a list / combo box.
7	Test a HTML program.
8	Test a program in MS Excel for data driven wizard.
9	Test the addition of two values in C++ program.
10	Write a test suite containing minimum four test cases.

224CA1A5CQ	CORE PRACTICAL: C# PROGRAMMING	SEMESTER V

Total Credits: 2
Total Instructions Hours: 48 h

S.No	List of Experiments
1	Develop a console application to implement the concept of Classes and objects.
2	Develop a console application to demonstrate Inheritance.
3	Develop a console application to implement Exception handling.
4	Develop a windows application to demonstrate Mouse Events.
5	Design a windows application using Generic controls.
6	Design a windows application using Advanced controls.
7	Build a web application to design College website.
8	Build a web application to demonstrate Validation controls.
9	Develop a windows application to work with Files.
10	Develop a windows application to work withMenus.
11	Build a web application to demonstrate Adrotator control.
12	Build a web application to demonstrate Database Connectivity.

224CA1A5SP	SEC PRACTICAL: WEB DESIGN AND DEVELOPMENT	SEMESTER V

Total Credits: 2
Total Instructions Hours: 48h

S.No	List of Experiments
1	Write a HTML program to demonstrate Table.
2	Write a HTML program to illustrate Frame.
3	Develop a registration form with necessary validating fields.
4	Develop a HTML document to demonstrate Style Sheet.
5	Demonstrate an XML program to display the Book Information.
6	Write a JavaScript to generate the pay slip.
7	Build a form that captures user input and displays it in real-time user data using Java Script.
8	Construct a Program to display a list of items using ReactJS
9	Build a counter application with buttons to increment and decrement the count using ReactJS
10	Develop an application to change the background color when clicked the component using ReactJS
11	Develop a to-do list application with features to add and remove tasks using ReactJS
12	Build a simple calculator application with basic arithmetic operations using ReactJS
13	Implement a basic authentication with login and registration for bank account holders using ReactJS
14	Develop an application for the student management system and implement routing to navigate through the pages using ReactJS

Course Code	Course Name	Category	L	T	P	Credit
224CA1A5DA	COMPUTER GRAPHICS	DSE –I	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- Computer graphics leading to the ability to understand contemporary terminology, rogress, issues, and trends.
- Mathematical Knowledge on Graphics and Technicalbackground of 2D and 3D objects.
- Geometric transformation and computer animation.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn methods for basic building blocks ofgraphics.	K1
CO2	Understand the key concept of two-dimensionalgeometric transformations.	K2
CO3	Apply the knowledge of clipping algorithm.	K3
CO4	Build the procedures for Three-dimensionalobjects.	K3
CO5	Understand various color models and animation techniques.	K2

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓	✓	✓	
CO2	✓				✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓	✓
CO5	✓	✓	✓	-	✓

COURSE FOCUSES ON

✓	Skill Development		Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

224CA1A5DA	COMPUTER GRAPHICS	SEMESTER V

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Graphics Output Primitives 10 h

Coordinate Reference Frames – Line-Drawing algorithms – Loading frame Buffer – Line function – Circle-Generating algorithms – Ellipse-generating algorithms – other curves.

Unit II Graphics Primitives Attributes and Geometric Transformations 10 h

Fill-Area Primitives – Polygon Fill Areas - Attributes of Graphics Primitives: Point attributes - Line Attributes – Curve attributes – Fill Area Attributes - Character Attributes. Geometric Transformations: Basic Two Dimensional Geometric Transformations – Matrix Representations and Homogeneous Coordinates – Two Dimensional Composite Transformations – Other Two Dimensional Transformations.

Unit III Two-Dimensional Viewing and Clipping 10 h

Two Dimensional Viewing: The Two Dimensional Viewing Pipeline – The Clipping Window – Normalization and Viewport transformations – Clipping Algorithms – Two Dimensional Point Clipping – Two Dimensional Line Clipping: Cohen-Sutherland line Clipping, PolygonFillArea Clipping: Sutherland-Hodgman Polygon Clipping.

Unit IV Three Dimensional Viewing 10 h

Overview of Three Dimensional Viewing Concepts – Transformation from World to View Coordinates – Geometric Transformations Three Dimensional Space – Three Dimensional Translation – Three Dimensional Rotation – Three Dimensional Scaling –Composite Three-Dimensional Transformations.

Unit V Color Models and Color Applications 8 h

Properties of Light – Color Models – The RGB Color Model – The CMY and CMYK Color Models – The HSV Color Model – The HLS Color Model – Color Selection and Applications – Computer Animation : Raster methods for Computer Animation – Design of Animation Sequences – Traditional Animation Techniques.

Text Books

1 Donald Hearn&M. Pauline Bake, 2009,"Computer Graphics with OpenGL", PHI, Third Edition

References

1 Willium M. Newman &Robert F. Sproull, 2007,"Principles of Interactive Computer Graphics", TMH

2 Krishnamoorthi N, 2003, "Introduction to Computer Graphics", TMH, Sixth Edition.

3 Plastock R & Xiang Z, Theory and problems of computer Graphics, Second Edition Schaum Series, McGraw Hill Publishers.

4 www.tutorialspoint.com

Course Code	Course Name	Category	L	T	P	Credit
224CA1A5DB	DATA MINING	DSE - I	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- Basic concepts, tasks, methods, and techniques in data mining
- Techniques in data mining and knowledge discovery
- The data mining process and issues, learnvarious techniques for data mining, and apply the techniques insolving data mining problems using data mining tools and systems

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the fundamentals ideas of Data warehouse.	K1
CO2	Classify the Techniques in Data Mining.	K2
CO3	Understand the classification and the clustering algorithms	K2
CO4	Construct rules-based algorithms.	K3
CO5	Build the knowledge in web mining	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓			
CO2	✓	✓	✓		✓
CO3	✓		✓	✓	✓
CO4	✓		✓	✓	✓
CO5	✓		✓	✓	✓

COURSE FOCUSES ON

✓	Skill Development		Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

224CA1A5DB	DATA MINING	SEMESTER V

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Data Warehousing and Business Analysis 10 h

Data warehousing Components –Building a Data warehouse –Data Warehouse Architecture – DBMS Schemas for Decision Support – Data Extraction, Cleanup, and Transformation Tools – Metadata – reporting – Query tools and Applications – Online Analytical Processing (OLAP) – OLAP and Multidimensional Data Analysis.

Unit II Basic Data Mining Tasks 10 h

Data Mining Versus Knowledge Discovery in Data Bases – Data Mining Issues – Data Mining Metrics -Data Mining Techniques – A Statistical Perspective on data mining – Similarity Measures – Decision Trees – Neural Networks – Genetic Algorithms.

Unit III Classification 10 h

Introduction – Statistical Based Algorithms – Distance Based Algorithms – Decision Tree – Based Algorithms – Neural Network Based Algorithms.

Clustering : Introduction – Similarity and Distance Measures – Outliers – Hierarchical Algorithms - Partitional Algorithms

Unit IV Association Rules 10 h

Introduction - Large Item sets – Basic Algorithms – Parallel & Distributed Algorithms - Incremental Rules - Advanced Association Rules Techniques- Measuring Quality Rules.

Unit V Web Mining 8 h

Web Content Mining – Web Structure Mining –Web Usage Mining-Spatial Mining: Spatial data – Spatial Rules- Spatial Classification Algorithms – Multimedia Data mining - Data mining Applications.

Text Books

1 Jiawei Han, MichelineKamber and Jian Pei, 2011,"Data Mining Concepts and Techniques", Elsevier,Third Edition.

2 Margaret H.Dunhabam, 2009, "Data Mining Introductory and Advanced Topics, Pearson Education

References

1 Prabhu C.S.R, 2011, "Data Warehousing Concepts, Techniques, Products and Applications", PHI Learning Private Limited,Third Edition.

2 Soman, K. P, DiwakarShyam and Ajay ,2009,"Insight Into Data Mining: Theory And Practice", PHI.

3 Amitesh Sinha, 2001, "Data Warehousing", Thomson Asia Pvt Ltd.

4 www.tutorialspoint.com

Course Code	Course Name	Category	L	T	P	Credit
224CA1A5DC	INTERNET OF THINGS AND APPLICATIONS	CORE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- The basic concepts of Internet of Things.
- The Communication Technologies and Specifications of IoT.
- The Applications on various IoT Domains.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understanding IoT Fundamentals.	K1
CO2	Select appropriate communication protocols and technologies for seamless machine-to-machine communication.	K2
CO3	Interpret various models of specifications to integrate devices for IoT Platforms.	K2
CO4	Explore the foundational knowledge and practical skills necessary to work with microcontroller platforms, sensors and actuators.	K3
CO5	Develop IoT solutions for diverse applications.	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓				
CO2	✓	✓			
CO3	✓	✓		✓	✓
CO4	✓	✓	✓	✓	✓
CO5	✓		✓	✓	✓

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

224CA1A5DC	INTERNET OF THINGS AND APPLICATIONS	SEMESTER V

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Introduction to IoT 8 h

Introduction of Internet of Things (IoT): Introduction - Physical Design of IoT - Logical Design of IoT - IoT Enabling Technologies - IoT Levels & Deployment Templates.

Unit II M2M, IoT Connectivity & Communication Technologies 9 h

M2M: Machine-to-Machine Communications - IoT versus M2M - IoT Connectivity Technologies: IEEE 802.15.4 , Zigbee, RFID, LoRa, Wi-Fi, Bluetooth.

IoT Data Protocols: MQTT, CoAP, AMQP, REST, SOAP - Associated IoT Technology: Sensor Cloud - Sensors-as-a-Service.

Unit III IoT Specification 10 h

IoT Specification : IoT platforms design Methodology - purpose and specification - process specification - Domain model specification- Information model specification- Service specification - IoT level specification-functional view specification- operational view specification- Device and component Integrators -Application Development.

Unit IV Microcontrollers, IoT Sensing and Actuation 13 h

Introduction to Arduino Boards: Arduino vs. Raspberry Pi - Choosing a board - Arduino installation and setup - Setting up Arduino IDE for NodeMCU - Writing an Arduino Sketch - Hands-on Experiments with Arduino: Printing on the serial console.

Introduction to Raspberry Pi Boards: Installation - Remotely accessing the Raspberry Pi - Introduction to Python basics - Accessing GPIO pins - Configuring WiFi on Raspberry Pi - Hands-on Experiments with Raspberry Pi: LED interface.

Sensors: Sensor Characteristics - Sensing Types: Scalar sensing, Multimedia sensing, Hybrid sensing - Sensing Considerations.

Actuators: Actuator Types: Hydraulic actuators, Pneumatic actuators, Electric actuators, Thermal/magnetic actuators, Mechanical actuators - Actuator Characteristics.

Unit V IoT Applications 8 h

IoT Applications for Home Automation: Smart Lighting - Cities: Smart parking, Environment: Weather Monitoring - Industry: Indoor Air Quality monitoring, Agriculture: Smart Irrigation - Health & Lifestyle: Wearable Electronics.

Text Books

1 Arshdeep Bahga & Vijay Madisetti, 2015, "Internet of Things", Universities Press (India) Private Limited. (Unit I, III & V).

2 S. Misra, A. Mukherjee, and A. Roy, 2020, "Introduction to IoT", Cambridge University Press.(Unit II & IV).

References

1 Vibha Soni, 2022, "IoT for Beginners", 1st Edition, BPB Publications, India.

2 Boris Adryan, Dominik Obermaier & Paul Fremantle, 2017, "The Technical Foundations of IoT", Artech Houser Publishers.

3 Michael Margolis, 2012, " Arduino Cookbook", 2nd Edition, O'Reilly Media.

4 https://onlinecourses.nptel.ac.in/noc22_cs53/preview.

224CA1A5GA	GENERIC ELECTIVE : SPREADSHEET APPLICATIONS	SEMESTER V

Total Credits: 2

Total Instruction Hours: 24 h

Syllabus

Unit I Introduction 5 h

Entering data in Excel – manually – Importing data using get & Transformation data – Applying data validations – Transforming and Managing data – sort, filter and advanced filter – Converting data into Table – Protecting Worksheet and workbook.

Unit II Functions 4 h

Functions – Basic calculations – Count Functions – Conditional calculations – Logical functions – Text functions- Network days - Lookup Functions.

Unit III Pivot Tables 5 h

Pivot tables – create a pivot table - Calculations and grouping options – Power pivot and power query – Accessing data in power pivot.

Unit IV Data Visualization 5 h

Charts – Insert a chart, add and remove chart elements – Column and Bar Charts – Line Chart – Pie and Doughnut chart – Area chart – X Y (Scatter) Chart and Bubble Chart – Stock Chart – Surface Chart – Time Line.

Unit V Data Extraction and Macros 5 h

Print Excel files - Understanding page setup options – Page Orientation – Macros – Difference between Macros and VBA – Record a macro – Save a Macro – Run a Macro – Checking the VBA Code – Edit or delete the macro.

Text Books

1 Lokesh Lalwani,2019, "Excel 2019 All-in-One", BPB Publications, India.

References

1 Sima Alex,2019, "Excel Formulas and Functions Cool Tips and Tricks With Formulas in Excel", Caprioru

2 Alan Murray, 2020, "Advanced Excel Success A Practical Guide to Mastering Excel" ,Apress

3 Stephen L. Nelson, E. C. Nelson , 2015, "Excel Data Analysis For Dummies", Wiley

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Course Code	Course Name	Category	L	T	P	Credit
224CA1A6CA	OPEN SOURCE TECHNOLOGIES	CORE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- The concepts on web design and PHP Programming
- The design of web applications
- Client side web application development using AngularJS

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Identify methods to define strings and arrays.	K1
CO2	Understand the functions and data reading operation in web page applications.	K2
CO3	Apply the data base concepts to read and write from database.	K3
CO4	Build applications using cookies, execute FTP and e-mail transactions.	K3
CO5	Develop and solve common web application tasks by writing PHP programs and publish applications on the web using AngularJS.	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓			✓	✓
CO2	✓			✓	✓
CO3	✓		✓	✓	✓
CO4	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

224CA1A6CA	OPEN SOURCE TECHNOLOGIES	SEMESTER VI

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Strings and Arrays 9 h

Development Environment – PHP Page – Mixing HTML and PHP - Variables: Storing Data. Strings and Arrays: String Functions - Converting to and from Strings – Formatting Text Strings – Array: Building and Modifying, Deleting Elements – Handling Arrays with Loops –Array Functions – Converting Between Strings and Arrays Using Implode and Explode - Extracting Data from Arrays – Sorting Arrays.

Unit II Functions and Reading Data 10 h

Functions in PHP – Passing Data and Arrays to Functions – Passing by Reference – Using Default Arguments – Passing Variable Numbers of Arguments - Returning Data from Functions – Returning arrays – Returning List – Returning References. Reading Data in Web Pages: Web Pages to Communicate with PHP – Handling: Text Fields, Text Areas, Checkboxes, Radio Buttons, List Boxes, Password Controls, Hidden Controls, Image Maps, File Uploads, Buttons.

Unit III PHP and Databases 10 h

Handling Form Data with Custom Arrays – Performing Data Validation - Requiring Data – Requiring Numbers – Requiring Text – Persisting User Data – Client-Slide Data Validation. Working with Databases: Creating MySQL Database – Creating Table – Inserting records. Accessing the Database in PHP – Updating Databases – Inserting data into Database – Deleting Records – Creating New Tables – Creating New Database – Sorting Data.

Unit IV Cookies, Sessions and Shapes 9 h

Cookies: Setting, Reading, Expiration, Delete – Sending E-mail – Advanced E-mail Attachments – Sessions: Storing Data, Hit Counter. Drawing Images on the Server: Creating Image – Displaying Images in HTML Pages – Drawing: Lines, Rectangles, Ellipses, Arcs.

Unit V Angular JS 10 h

Angular JS: Framework - First AngularJS Application - MVC: Design Patterns - Model view controller - Filters and Modules - Directives: Basics of Directives- Using

Directives - Built-in Directives - Custom Directives - Services and Server Communication.

Text Books

1 Steven Holzner, 2018, "PHP: The Complete Reference", Indian Edition, McGraw-Hill.

2 Andrew Grant, 2017, "Beginning AngularJS", Apress.

References

1 Steve Suehring, 2009, "PHP6 MySQL", Tim Converse, Joyce Park, Willy.

2 Vikramvaswani, 2009, "PHP A Beginner's Guide ", Tata MC-Graw Hill Publications.

3 Adam Freeman, 2014,"Pro AngularJS", Apress.

4 www. php.org

224CA1A6CP	CORE PRACTICAL : OPEN SOURCE TECHNOLOGIES	SEMESTER VI

Total Credits: 2
Total Instructions Hours: 48 h

S.No	Contents
1	Handling Strings in PHP.
2	Implementing and Manipulating Arrays in PHP.
3	Defining and Implementing Functions in PHP.
4	Generic Controls implementation in PHP.
5	Advanced Controls implementation in PHP.
6	Client-Side Data Validation through PHP.
7	Accessing the Database through PHP.
8	Sessions and Cookies implementation in PHP.
9	E-mail functions utilization in PHP.
10	Drawing Shapes in PHP with GD Library.
11	Implementing AngularJS with UI Controls.
12	Working with AngularJS Directives

224CA1A6SP	SEC PRACTICAL: MULTIMEDIA TECHNOLOGIES	SEMESTER VI

Total Credits: 2
Total Instructions Hours: 48 h

S.No	Contents
1	Create a flower using GIMP.
2	Apply wrap text around image using GIMP.
3	Blend two images using GIMP.
4	Animate a flying object using GIMP.
5	Apply Plastic Surgery for Nose using GIMP.
6	Apply 2D animation using GIMP.
7	Convert Black and White to Color Photo using GIMP.
8	Design a Website using GIMP.
9	Create a company logo with selection tool and crop tool using GIMP.
10	Design a Visiting Card using GIMP.
11	Prepare a Cover Page for the Book using GIMP.
12	Create a Video Clipping using Editing Tools.

Course Code	Course Name	Category	L	T	P	Credit
224CA1A6DA	COMPUTER VISION	DSE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- Comprehensive theoretical foundation in computer vision, integrating fundamental concepts with modern applications
- The concepts how images are captured, processed, and analyzed
- The methods for analyzing image alignment, segmentation, and rendering

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the foundational concepts of computer vision and image formation.	K1
CO2	Explore basic image processing techniques and their applications in visual data analysis.	K2
CO3	Interpret and describe methods for instance recognition and image classification.	K2
CO4	Apply the concepts of model fitting and optimization in computer vision tasks.	K3
CO5	Utilize feature detection and matching techniques to interpret visual scenes.	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓		✓		✓
CO2	✓		✓		✓
CO3	✓	✓	✓		✓
CO4	✓	✓	✓		✓
CO5	✓		✓		✓

COURSE FOCUSES ON

✓	Skill Development		Entrepreneurial Development
✓	Employability	✓	Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

224CA1A6DA	COMPUTER VISION	SEMESTER VI

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I **Image Formation** 9 h

Computer Vision – History- Geometric primitives and transformation:2D transformations, 3D transformations, 3D rotations, 3D to 2D projections, Lens Distortions - Photometric image formation: Lighting, Reflectance and shading, Optics - Digital Camera: Sampling and Aliasing-Color-Compression.

Unit II **Image Processing** 10 h

Point operators : Pixel Transforms, Color Transforms, Compositing and matting, Histogram equalization - Linear filtering: Separable filtering, Band-pass and steerable filters - Non-linear filtering- Bilateral filtering- Binary image processing – Fourier transforms: Two-dimensional Fourier transforms - Geometric transformations.

Unit III **Model fitting and Optimization** 10 h

Scattered data interpolation: Radial basis functions, overfitting and underfitting, Robust data fitting - Variational methods and regularization: Discrete energy minimization, Total variation, Bilateral solver.

Unit IV **Recognition** 10 h

Instance recognition- Image classification: Feature-based methods, Deep networks, Face recognition - Object detection: Face detection, Pedestrian detection - Semantic segmentation: Instance segmentation, Panoptic segmentation, Pose estimation-Video understanding.

Unit V **Feature Detection and Matching** 9 h

Points and patches: Feature detectors, Feature descriptors, Feature matching, Large-scale matching and retrieval, Feature tracking - Edges and contours: Edge detection, Contour detection - Contour Tracking: Snakes and scissors, Level Sets - Lines and vanishing points: Hough transforms- Segmentation: Graph-based segmentation.

Text Books

1 Richard Szeliski, 2022, "Computer Vision: Algorithms and Applications", 2nd Edition, Springer.

References

1 D. A. Forsyth, J. Ponce, 2015 "Computer Vision: A Modern Approach", 2nd Edition, Pearson Education.

2 E. R. Davies, 2012," Computer and Machine Vision", 4th Edition ,Academic Press.

3 Richard Hartley and Andrew Zisserman, 2004, "Multiple View Geometry in Computer Vision", 2nd Edition, Cambridge University Press.

Course Code	Course Name	Category	L	T	P	Credit
224CA1A6DB	MACHINE LEARNING AND APPLICATIONS	DSE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- The fundamental concepts of Machine Learning
- The various methods and learning algorithms in Machine Learning
- Applications of Machine Learning

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the basic concepts of Machine Learning.	K1
CO2	Explain the process of building Supervised Learning models.	K2
CO3	Describe the process of building Unsupervised Learning models.	K3
CO4	Apply learning algorithms to solve real-world problems.	K3
CO5	Apply Machine Learning algorithms for image, speech, prediction, and recommendations.	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓			✓	
CO2	✓		✓	✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓	✓
CO5	✓		✓	✓	✓

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

224CA1A6DB	MACHINE LEARNING AND APPLICATIONS	SEMESTER VI

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Machine Learning 10 h

Human Learning - Types of Human Learning- Machine Learning: Types of Machine Learning - Applications of Machine Learning - Languages and Tools in Machine Learning - Issues in Machine Learning.

Unit II Supervised Learning 10 h

Supervised Learning - Example of Supervised Learning - Classification Model - Classification Learning steps - Common Classification Algorithms: k-Nearest Neighbour, Decision Tree, Random Forest Model, Support Vector Machines - Regression - Common Regression Algorithms.

Unit III Unsupervised Learning 10 h

Unsupervised Learning - Unsupervised versus Supervised Learning- Application of Unsupervised Learning - Clustering - Types of Clustering – Partitioning method – K-medoids – Hierarchical Clustering.

Unit IV Learning Algorithms 10 h

Introduction - Representation Learning - Active Learning - Instance-Based Learning - Associate Rule Learning Algorithm - Ensemble Learning Algorithm - Regularization Algorithm.

Unit V Machine Learning Applications 8 h

Image Recognition - Speech Recognition - Traffic Prediction Product Recommendations - Self-driving cars - Email Spam and Malware Filtering – V irtual Personal Assistant - Stock Market Trading - Automatic Language Translation.

Text Books

1 Saikat Dutt, Subramanian Chandramouli, Amit Kumar Das, 2021, "MachineLearning", 7th Edition, Pearson India Education Services Pvt. Ltd.

2 Dr Ruchi Doshi, Dr kamal kant Hiran, Ritesh Kumar Jain, Dr Kamlesh Lakwani, 2022,"MachineLearning", 1st Edition, BPB Publications.

References

1 Ethem Alpaydin, 2014 ,"Introduction to Machine Learning", 3rd Edition, MIT Press, Prentice Hall of India.

2 Mehryar Mohri, Afshin Rostamizadeh, Ameet Talwalkar, 2012, "Foundations of Machine Learning", MIT Press.

3 Kevin P.Murphy, 2012, "Machine Learning: A Probabilistic Perspective", The MIT Press

4 Harsh Bhasin, 2020, "Machine Learning For Beginners", 2nd Edition, Apress.

Course Code	Course Name	Category	L	T	P	Credit
224CA1A6DC	CLOUD TECHNOLOGIES	DSE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- Various Cloud models and its architecture
- Different Cloud Enabling Technologies
- Web-based Cloud Applications

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the fundamental concepts and models of cloud.	K1
CO2	Understand the cloud enabling technology.	K2
CO3	Explain the various computing architectures of cloud.	K2
CO4	Interpret advanced cloud computing architectures.	K2
CO5	Implement Cloud Computing applications in different domains.	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓				
CO2	✓	✓			✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓		✓	✓
CO5	✓				✓

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability		Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

224CA1A6DC	CLOUD TECHNOLOGIES	SEMESTER VI

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Cloud Computing 10 h

Introduction - Business Drivers – Technology Innovations – IT Resource – On Premise –Cloud Consumers and Cloud Providers – Scaling –Cloud Service – Cloud Service Consumer– Goals and Benefits – Risk and Challenges - Fundamentals concepts and Models: Roles and Boundaries, Cloud Characteristics – Cloud Delivery Models: Infrastructure-as-a-Service, Platform-as-a-Service, Software-as-a-Service - Cloud Deployment Models: Public Clouds, Community Clouds, Private Clouds, Hybrid Clouds – Other Cloud Deployment Models.

Unit II Cloud Enabling Technology 10 h

Broadband Networks and Internet Architecture: Internet Service Provider, Connectionless Packet Switching, Router Based Interconnectivity - Data Center Technology - Virtualization Technology – Web Technology – Multitenant Technology – Service Technology.

Unit III Cloud Computing Architectures 10 h

Workload Distribution Architecture - Resource Pooling Architecture - Dynamic Scalability Architecture – Elastic Resource Capacity Architecture – Service Load Balancing Architecture – Cloud Bursting Architecture – Elastic Disk Provisioning Architecture – Redundant Storage Architecture.

Unit IV Advanced Cloud Architectures 9 h

Load Balanced Virtual Server Instances Architecture – Zero Downtime Architecture – Dynamic Failure Detection and Recovery Architecture – Cloud Security Threats.

Unit V Platforms and Applications 9 h

Platforms: Amazon Web Services – Google App Engine – Cloud Applications: Scientific Applications – Healthcare: ECG Analysis in Cloud – Biology: Protein Structure Prediction – Business and Consumer Applications: CRM and ERP, Social Networking.

Text Books

1. Thomas Erl, Zaigham Mahmood and Ricardo Puttini, 2019, "Cloud Computing Concepts, Technology & Architecture", Twelfth Impression , Pearson India Education Services Pvt. Ltd.

2. Rajkumar Buyya, Christian Vecchiola and S.ThamaraiSelvi, 2018, "Mastering Cloud Computing", Thirteenth reprint , McGraw Hill Education(India) Pvt. Ltd.

References

1. Kumar Saurabh, 2011, "Cloud Computing – Insights into New Era Infrastructure", Wiley Indian Edition.

2. Kaittwang Geoffrey C.Fox and Jack J Dongrra, 2012, "Distributed and Cloud Computing", Elsevier.

3. Michael Miller,2008, "Cloud Computing: Web-Based Applications That Change the Way You Work and Collaborate Online", Que Publishing.

4. www.onlinecourses.nptel.ac.in/noc24_cs17

Course Code	Course Name	Category	L	T	P	Credit
224CA1A6DD	AUGMENTED REALITY AND VIRTUAL REALITY	DSE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- The fundamental aspects of Augmented Reality and Virtual Reality technologies
- The concepts of input devices and output devices in Virtual Reality
- The technologies involved in the development of Augmented Reality and Virtual Reality

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the basic concepts of Augmented Reality.	K1
CO2	Understand the working principle and components used in Virtual Reality.	K2
CO3	Gain knowledge of modelling techniques in Virtual Reality.	K2
CO4	Explore the technologies associated with Virtual Reality.	K2
CO5	Know the applications of Augmented Reality and Virtual Reality in different domains.	K2

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓				
CO2	✓				
CO3	✓		✓	✓	✓
CO4	✓	✓	✓	✓	✓
CO5	✓				

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

224CA1A6DD	AUGMENTED REALITY AND VIRTUAL REALITY	SEMESTER VI

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Augmented Reality 9 h

Introduction to Augmented reality – Computer Vision for AR- Marker Tracking - Interaction -Output Modalities- Input modalities – Modeling and Annotation.

Unit II Virtual Reality 10 h

Introduction to Virtual Reality - Definition-Three I's of Virtual Reality- Classic Components of VR System: Input devices: Mechanical Tracker, Magnetic Tracker, Ultrasonic Tracker, Optical Tracker, Trackballs. Output Devices: Human Visual Display, Large Volume Display.

Unit III VR Modeling 10 h

Modeling: Geometric Modeling - Kinematic Modeling: Transformation Invariants - Object Hierarchies - Viewing 3D World – Physical Modeling -Behavioral Modeling.

Unit IV VR Programming 10 h

Toolkits and Scene Graphs- World Tool Kit: Model Geometry and Appearance, WTK Scene Graph - JAVA 3D : Model Geometry and Appearance, Java 3D and scene Graph, Sensors and Networking.

Unit V Applications 9 h

Education, Arts and Entertainment - Military VR Applications - VR Application in Manufacturing - Plant Design and Construction.

Text Books

1 Grigore C Burdea , Philippe Coiffet , 2014, "Virtual Reality and Technology ", 2nd Edition, Wiley Publishers.

2 Dieter Schmalstieg, Tobias Hollerer , 2016, " Augmented Reality", First Impression, Pearson.

References

1 John Vince, 2004, "Introduction to Virtual Reality", Springer-Verlag.

2 William R. Sherman, Alan B. Craig , 2003 ," Understanding Virtual Reality - Interface, Application, Design", Morgan Kaufmann.

3 Timothy Jung M Claudia tom Dieck , 2018, "Augment Reality and Virtual Reality Empowering Human Place and Business", Springer International Publishers.

4 Sumit Badotra , Sarvesh Tanwar, Ajay Rana , Nidhi Sindhwani and Ramani Kannan, 2023," Handbook of Augmented and Virtual Reality , De Gruyter.

Course Code	Course Name	Category	L	T	P	Credit
224CA1A6DE	DEEP LEARNING	DSE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- The idea of artificial neural networks and their architecture
- The techniques used for training artificial neural networks
- The design of an artificial neural network for classification

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the fundamentals and functioning of artificial neural networks.	K1
CO2	Illustrate the concept of Convolutional Neural Networks and their architecture.	K2
CO3	Apply the knowledge of Autoencoders and Recurrent Neural Network algorithms.	K3
CO4	Implement the concepts of various deep learning algorithms.	K3
CO5	Design and develop various deep learning applications.	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓				
CO2	✓			✓	✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓		✓
CO5	✓		✓	✓	✓

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

224CA1A6DE	DEEP LEARNING	SEMESTER VI

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Introduction to Neural Networks 9 h

Artificial Neural Networks: Building Intelligent Machines- Limits of Traditional Computer Programs-Neuron-Feed-Forward Neural Networks- Linear Neurons and Limitations – Sigmoid – Tanh - and ReLU Neurons - Softmax Output Layers - Training Feed-Forward Neural Networks-Gradient Descent-Delta Rule and Learning Rates-Backpropagation Algorithm-Stochastic and Minibatch Gradient Descent - Test Sets - Validation Sets and Overfitting.

Unit II Convolutional Neural Networks 10 h

Neurons in Human Vision- Feature Selection- Filters and Feature Maps - Convolution Layer- Max Pooling- Architecture -Accelerating Training with Batch Normalization-Building a Convolutional Network using TensorFlow- Visualizing Learning in Convolutional Networks.

Unit III Autoencoders and Recurrent Neural Networks 10 h

Autoencoders Architecture - Implementing an Autoencoder in TensorFlow–Denoising- Sparsity in Autoencoders. Models for Sequence Analysis: Recurrent Neural Networks- Vanishing Gradients- Long Short-Term Memory Units-TensorFlow Primitives for RNN Models-Augmenting Recurrent Networks with Attention.

Unit IV Practical Methodology 10 h

Performance Metrics- Selecting Hyperparameters. Automatic Hyperparameter Optimization Algorithms: Grid Search - Random Search - Model-Based Hyperparameter Optimization - Debugging Strategies.

Unit V Applications 9 h

Large-Scale Deep Learning: GPU Implementations - Specialized Hardware Implementations of Deep Networks. Computer Vision: Preprocessing. Speech Recognition - Natural Language Processing: Neural Language Models - Exploration Versus Exploitation.

Text Books

1. Nikhil Buduma, 2022, "Fundamentals of Deep Learning: Designing Next-Generation Machine Intelligence Algorithm", O'Reilly.
2. Ian Goodfellow, Yoshua Bengio and Aaron Courville, 2023, "Deep Learning", MIT Press.

References

1. Daniel A. Roberts, 2022, "The Principles of Deep Learning Theory: An Effective Theory Approach to Understanding Neural Networks", Cambridge University Press.
2. Amlan Chakrabarti Amit Kumar Das, Saptarsi Goswami, Pabitra Mitra, 2021, "Deep Learning", Pearson Education.

Course Code	Course Name	Category	L	T	P	Credit
224CA1A6DF	FUNDAMENTALS OF BLOCKCHAIN AND APPLICATIONS	DSE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- The basic concepts of Blockchain Technology
- The architecture of Blockchain Technology
- The applications of Blockchain Technology in various domains

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn Blockchain Fundamentals.	K1
CO2	Understand the Blockchain Architecture and Cryptographic techniques.	K2
CO3	Explore appropriate hash function and Consensus mechanisms.	K2
CO4	Interpret knowledge on Smart contracts.	K2
CO5	Analyze the applications of Blockchain Technology in various domains.	K3

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓				
CO2	✓	✓			✓
CO3	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓	✓
CO5	✓				✓

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
	Intellectual Property Rights		Gender Sensitization
	Social Awareness/ Environment		Constitutional Rights/ Human Values/ Ethics

224CA1A6DF	FUNDAMENTALS OF BLOCKCHAIN AND APPLICATIONS	SEMESTER VI

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Concepts and Components 9 h

Introduction – History – Fundamentals - Characteristics - Consensus in Trust-Building – Public, Private and Hybrid Blockchains – Distributed Ledger Technology – DLT Decentralized Applications and Databases. Components: Introduction – Ethereum – Working of Ethereum.

Unit II Architecture and Cryptography 10 h

Architecture of Blockchain – Transactions – Chaining Blocks. Decentralized System: Distributed Decentralized Databases – Decentralized Enterprise – Decentralization – Disintermediation - Enterprise Regulation. Cryptography: Introduction – Primitives – Symmetric – Asymmetric.

Unit III Hash Functions and Consensus 10 h

Hashing: Characteristics, Security Requirements, Attacks – Distributed Hash Tables: Consistent Hashing, Rendezvous Hashing, Comparison of Consistent and Rendezvous Hashing - Consensus: Approach – Algorithms: Proof-of-Work, Proof-of-Stake, Proof-of-Activity, Proof-of-Elapsed-Time, Proof-of-Burn, Proof-of-Proof, Proof-of-Capacity.

Unit IV Smart Contracts 10 h

Introduction – Absolute and Immutable – Contractual Confidentiality -Law Implementation and Settlement - Characteristics - Internet of Things – Smart Grid – Proof of Origin - Supply chain management – Medical Sciences – Finance – Media and Entertainment - Public Services – Legal Services.

Unit V Applications 9 h

Bitcoins: Introduction – Working of Bitcoin - Blockchain Vertical Solutions and Use Cases: Blockchain in Insurance, Healthcare, Smart Assets, Manufacturing. Blockchain and Allied Technologies: Cloud computing, Artificial Intelligence, Internet of Things.

Text Books

1 Kumar Saurabh and Ashutosh Saxena, 2020, "Blockchain Technology – Concepts and Applications", 1st Edition, Wiley India Pvt Ltd.

2 Imran Bashir, 2018, "Mastering Blockchain", 2nd Edition, Packt Publishing Ltd.

References

1 Koshik Raj , 2019,"Foundations of Blockchain", 1st Edition, Packt India.

2 Daniel Drescher, 2017, "Blockchain Basics: A Non,Technical Introduction in 25 Steps", 1st Edition, Apress.

3 Bikramaditya Singhal, Gautam Dhameja, Priyansu Sekhar Panda, 2019, "Beginning Blockchain - A Beginner's guide to Building Blockchain Solutions", 1st Edition, Apress India.

4 Peter Lipovyanov , 2019, "Blockchain for Business", 1st Edition, Packt USA.

Course Code	Course Name	Category	L	T	P	Credit
223BC1A6AA	INNOVATION, IPR AND ENTREPRENEURSHIP	AECC	2	-	-	2

PREAMBLE

This course has been designed for students to learn and understand

- The role of Entrepreneurship in Economic Development and basics of Intellectual Property Rights, Copy Right Laws, Trade Marks and Patents
- ethical and professional aspects related to intellectual property law context
- Intellectual Property as a career option

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the concept of innovation, IPR, entrepreneurship and its role in economic development.	K2
CO2	Know the value, purpose and process of Patent.	K2
CO3	Understand the basics of trademarks and industrial designs.	K2
CO4	Acquire knowledge about copyright and copyright law.	K2
CO5	Identify Geographical Indications.	K2

MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	✓	✓		✓	✓
CO2	✓	✓		✓	✓
CO3	✓	✓			✓
CO4	✓	✓		✓	✓
CO5	✓	✓			✓

COURSE FOCUSES ON

✓	Skill Development	✓	Entrepreneurial Development
✓	Employability	✓	Innovations
✓	Intellectual Property Rights		Gender Sensitization
✓	Social Awareness/ Environment	✓	Constitutional Rights/ Human Values/ Ethics

223BC1A6AA	INNOVATION, IPR AND ENTREPRENEURSHIP	SEMESTER VI

Total Credits: 2

Total Instruction Hours: 24 h

Syllabus

Unit I Introduction to Innovation and Entrepreneurship 05 h

Meaning of Creativity, Invention and innovation - Types of Innovation - Introduction and the need for Intellectual Property Right (IPR) - Kinds of IPR – National and International IPR Policy. Entrepreneurs-Concept, characteristics, Functions, need and types, Entrepreneurial decision process. Role of Entrepreneurship in Economic Development.

Case Study: Jayabharati Viswanath: A case of Ladel to Leather.

Unit II Patents 05 h

Introduction and origin of Patent System in India- Conceptual Principles of Patent Law in India - Process for obtaining patent - Rights granted to a Patentee -Validity of patent- Infringement of Patent.

Case Study: Apple Inc. v. Samsung Electronics Co. Ltd. (2020)

Unit III Trademarks 05 h

Origin of Trade Marks System - Types - Functions - Distinctiveness and Trademarks - Meaning of Good Trademark - Rights granted by Registration of Trademarks - Infringement of trademark.

Case Study: Merck v. Mylan Pharmaceuticals (2016)

Unit IV Copyright 05 h

Introduction and Evolution of Copyright - Objectives and fundamentals of Copyright Law - Requirements for Copyrights - Works protectable under Copyrights - Authorship and Ownership - Rights of Authors and Copyright owners - Infringement of Copyright.

Case Study: J.K. Rowling and Warner Bros. v. Steve Vander Ark (2007)

Unit V Geographical Indications 04 h

Introduction and Concept of Geographical Indications - History - Administrative Mechanism - Benefits of Geographical Indications - Infringement of registered Geographical Indication.

Case Study: Darjeeling Tea v. Tea Board of India (2012)

Note: Case studies related to the above topics to be discussed (Examined internal only)

Text Books

1 Nithyananda, K V. 2019, "Intellectual Property Rights" Protection and Management. Cengage Learning India Private Limited, New Delhi, India.

2 Dr.S.S.Khanka, 2020,"Entrepreneurial Development", S Chand and Company Limited, New Delhi, India.

References

1 Ahuja, V K. 2017, "Law relating to Intellectual Property Rights", 3rd Edition, Lexis Nexis, Gurgaon, India.

2 Neeraj, P., & Khusdeep, D. 2014, "Intellectual Property Rights",1st Edition, PHI learning Private Limited, New Delhi,India.

3 http://www.bdu.ac.in/cells/ipr/docs/ipr-eng-ebook.pdf.

4 https://knowledgentia.com/knowledgeate

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