Dr. N.G.P. ARTS AND SCIENCE COLLEGE
(An Autonomous Institution, Affiliated to Bharathiar University, Coimbatore)
(Approved by Government of Tamil Nadu & Accredited by NAAC with A++ Grade (3rd Cycle - 3.64 CGPA)
Dr. N.G.P. – Kalapatti Road, Coimbatore – 641 048, Tamil Nadu, India
Web : www.drngpasc.ac.in | Email : info@drngpasc.ac.in | Phone : +91-422-2369100

REGULATIONS 2022-23 for Under Graduate Programme
(Outcome Based Education model with Choice Based Credit System)

Bachelor of Science in Computer Technology Degree

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

Programme: B.Sc. (Computer Technology)

Eligibility

Candidates for admission to the first year of the **Bachelor of Science (Computer Technology)** 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 / Statistics / Business Mathematics 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 significant understanding the Key Concepts of various Computer technologies.
2. To stimulate the interest among the learners on various technologies through Lab sessions.
3. Inculcating professional competence in technologies, software design, database and Quality Assurance.
4. To facilitate the learners to develop skills to meet the requirements of the corporate.
5. To develop competency in research and in current technologies.

PROGRAMME OUTCOMES

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

PO Number	POStatement
PO1	Capability to intend, execute and assess a computer based system on par with the industry standards through the ability to identify the problem and capability to provide a solution
PO2	Correlate the knowledge of mathematics and computing in the field of project development and apply the obtained knowledge in real – time platform using latest tools and technologies
PO3	Ability to excel in the field of IT and ITES by enduring learning to accomplish their goals
PO4	Improve the ability to communicate effectively and to work as individual or team in the industry / enterprise / community
PO5	Understand proficient, ethical, and social issues and community responsibilities

B.Sc. Computer Technology
Credit Distribution

Part	Subjects	No. of Papers	Credit	Semester No.
I (12 Credits)	Tamil / Hindi / French/Malayalam	4	4 x 3 = 12	I to IV
II (12 Credits)	English	4	4 x 3 = 12	I to IV
III (108Credits)	Core (Credits 4)	11	11 x4= 44	I to VI
	Core (Credits 3)	2	2 x 3 = 6	III &VI
	Core Practical (Credits 5)(Embedded)	2	2 x 5 = 10	III to IV
	Core Project (Credits 4)	1	1 x 4 = 4	VI
	Core Practical (Credits 2)	3	3 x 2 = 6	I, II &V
	Inter Departmental Course (IDC)	4	4 x 4 = 16	I to IV
	Discipline Specific Elective (DSE)	3	3 x 4 =12	V & VI
	Skill Enhancement Course(SEC)	4	4 x 2 = 8	III,IV,V&VI
	Industrial Training	1	1 x 2=2	V
IV (8 Credits)	Environmental Studies(AECC)	1	2	I
	Basic Tamil/Advance Tamil/Human Rights, & Women's Rights (AECC)	1	2	II
	Innovation & IPR/ Innovation, IPR & Entrepreneurship (AECC)	1	2	VI
	Generic Elective(GE)	1	1 x 2=2	V
V (2 Credits)	NSS/NCC/YRC/RRC/Yoga/Sports	-	2x1=2	I - II
TOTAL CREDITS			142	

CURRICULUM

B.Sc. COMPUTER TECHNOLOGY 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
224CT1A1CP	Core Practical - I	Programming in C	-	-	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										
224CT1A1XA	Extension Activity	NSS/NCC/ YRC/RRC/ Yoga/Sports/ Clubs	-	-	-	-	50	-	50	1
Total			22	3	5	-	-	-	700	23

BoS Chairman/HoD
Department of Computer Technology
Dr. N.G.P. Arts and Science College
Coimbatore – 641 048

Dr.N.G.P. Arts and Science College
APPROVED
BoS 13th 27/7/22 | AC - 13th 6/9/22 | GB - 18th 10/9/22

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

Course Code	Course Category	Course Name	L	T	P	Exam (h)	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
224CT1A2CP	Core Practical-II	Programming in 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										
224CT1A2XA	Extension Activity	NSS/NCC/ YRC/RRC/ Yoga/Sports/Clubs	-	-	-	-	50	-	50	1
Total			22	3	5	-	-	-	700	23

BoS Chairman/HoD
Department of Computer Technology
Dr. N. G. P. Arts and Science College
Coimbatore – 641 048

Dr.NGPASC
COIMBATORE | INDIA

Dr.N.G.P. Arts and Science College
APPROVED
BoS- 14th 05/12/22 | AC - 14th 19.01.23 | GB - 19th 30.01.23

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

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
224CT1A3SP	SEC Practical -I	SQL Programming	-	-	4	3	50	50	100	2
225BP1A3IA	IDC -III	Corporate Culture	4	-	-	3	50	50	100	4
Total			**20**	**2**	**08**	-	-	-	**700**	**24**

BoS Chairman/HoD
Department of Computer Technology
Dr. N. G. P. Arts and Science College
Coimbatore – 641 048

Dr.N.G.P. Arts and Science College
APPROVED
BoS- 10/6/23 | AC - 14/7/23 | GB - 5/8/23

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
224CT1A4CB	Core-VIII	Web Application Development	3	-	-	3	50	50	100	3
224CA1A4EP	Embedded Practical	Python Programming	3	-	4	3	50	50	100	5
224CT1A4SP	SEC Practical -II	Web Programming	-	-	4	3	50	50	100	2
225BI1A4IB	IDC -IV	Social Media Marketing	4	-	-	3	50	50	100	4
Total			**20**	**2**	**08**	-	-	-	**700**	**24**

17/10/23

BoS Chairman/HoD
Department of Computer Technology
Dr. N. G. P. Arts and Science College
Coimbatore – 641 048

Dr.N.G.P. Arts and Science Co...
APPROVED
BoS- 16th 17.10.23 | AC - 16th 13.12.2023 | GB - 21st 05.01.2024

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

Dr.NGPASC
COIMBATORE | INDIA

Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
Fifth Semester										
Part–III										
224CT1A5CA	Core - IX	Software Engineering and Testing	4	1	-	3	50	50	100	4
224IT1A5CB	Core - X	Cyber Security and Ethics	4	1	-	3	50	50	100	4
224CT1A5CB	Core - XI	PHP Programming	4	1	-	3	50	50	100	4
224CT1A5CP	Core Practical -V	Programming in PHP	-	-	4	3	50	50	100	2
224CT1A5SP	SEC Practical - III	Android Application Development	-	-	4	3	50	50	100	2
224CT1A5DA	DSE –I	Data Mining Techniques	4	1	-	3	50	50	100	4
224CT1A5DB		Distributed Computing								
224CT1A5DC		Service Oriented Architecture								
224CT1A5TA	IT	Industrial Training	-	-	-	3	50	50	100	2
Part-IV										
	GE		2	-	-	-	50	-	50	2
Total			**18**	**4**	**8**	-	-	-	**750**	**24**

BoS Chairman/HoD
Department of Computer Technology
Dr. N. G. P. Arts and Science College
Coimbatore – 641 048

Dr.N.G.P. Arts and Scien[illegible] Co
APPROVED
BoS- 17th 3/4/24 | AC - 17th 27/4/24 | GB -

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

Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
Sixth Semester										
Part–III										
224CT1A6CA	Core - XII	R for Analytics	4	-	-	3	50	50	100	4
224CT1A6CB	Core - XIII	Blockchain Technology Essentials	4	-	-	3	50	50	100	4
224CT1A6SP	SEC Practical-IV	Analytics using R	-	-	4	3	50	50	100	2
224CT1A6CV	Core - XIV	Project and Viva voce	-	-	8	3	50	50	100	4
224CT1A6DA	DSE – II	Artificial Intelligence and Machine Learning Techniques	4	-	-	3	50	50	100	4
224CT1A6DB		Cloud Computing and Virtualization								
224CT1A6DC		Fundamentals of Internet of Things								
224CT1A6DD	DSE – III	Big Data Tools and Technologies	4	-	-	3	50	50	100	4
224CT1A6DE		Fault Tolerant Systems								
224CT1A6DF		Edge Computing								
Part - IV										
223BC1A6AA	AECC - III	Innovation, IPR and Entrepreneurship	2	-	-	-	50	-	50	2
Total			**18**	**-**	**12**	**-**	**-**	**-**	**650**	**24**
***Grand Total**									**4200**	**142**

BoS Chairman/HoD
Department of Computer Technology
Dr. N. G. P. Arts and Science College
Coimbatore – 641 048

Dr.N.G.P. Arts and Science College
APPROVED
BoS- 18th 08/11/24 | AC - 18th 26/11/24 | GB -

Academic Council * Dr.N.G.P. Arts and Science College

Dr.NGPASC
COIMBATORE | INDIA

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	224CT1A5DA	Data Mining Techniques
2	224CT1A5DB	Distributed Computing
3	224CT1A5DC	Service Oriented Architecture

Semester VI (Elective II) List of Elective Courses

S. No.	Course Code	Name of the Course
1	224CT1A6DA	Artificial Intelligence and Machine Learning Techniques
2	224CT1A6DB	Cloud Computing and Virtualization
3	224CT1A6DC	Fundamentals of Internet of Things

Semester VI (Elective III) List of Elective Courses

S. No.	Course Code	Name of the Course
1	224CT1A6DD	Big Data Tools and Technologies
2	224CT1A6DE	Fault Tolerant Systems
3	224CT1A6DF	Edge Computing

GENERIC ELECTIVE COURSES(GE)

The following is the course offered under Generic Elective Course

Semester V

S. No.	Course Code	Name of the Course
1	224CT1A5GA	Web Development Essentials

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	224CT1ASSA	Multimedia and Animation
2	224CT1ASSB	Social Networking

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.

Mandatory

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	**10**x2=20	**Choose the correct answer**	**10**x1=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			

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 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	K3
CO2	மதிப்புக்கல்வி (Attitude and Value education)	K4
CO3	பாடஇணைச்செயல்பாடுகள் (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 - நாமக்கல்கவிஞர்
5. தமிழ்க் கொலை புரியாதீர் - புலவர் குழந்தை
6. திரைத்தமிழ்

அ) 'விஞ்ஞானத்த வளர்க்கப் போறண்டி'எனத்தொடங்கும் பாடல் - உடுமலை நாராயண கவி

ஆ) 'சும்மா கிடந்த நிலத்தை' எனத்தொடங்கும் பாடல் - பட்டுக்கோட்டை கல்யாண சுந்தரனார்

இ) 'சமரசம் உலாவும் இடமே' எனத்தொடங்கும் பாடல்- மருதகாசி

ஈ) 'உன்னை அறிந்தால்' எனத்தொடங்கும் 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,னவேறுபாடு - ஒலிப்பு நெறி,சொற்பொருள் வேறுபாடு அறிதல்)

ஆ. படைப்பாக்கம்

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

2.சிறுகதை - எழுதுதல் (குறைந்தது 3 பக்கங்கள்)

Text Book

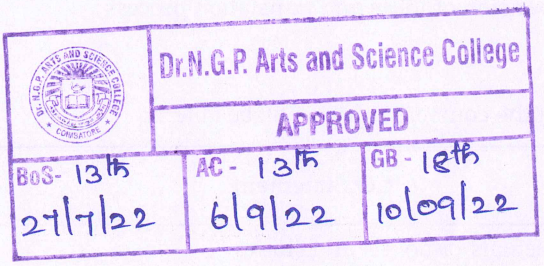
1 தமிழ் மொழிப்பாடம் - 2022-2023,தொகுப்பு: தமிழ்த்துறை, டாக்டர்என்.ஜி.பி. கலை அறிவியல் கல்லூரி,கோயம்புத்தூர் – 641048,வெளியீடு: நியூ செஞ்சுரி புக் ஹவுஸ்,சென்னை – 600 098.

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 - नूतनगद्यसंग्रह(जयप्रकाश)पाठ 1- रजियापाठ 2- मक्रीलपाठ 3- बहतापानीनिर्मला
पाठ 4- राष्ट्रपितामहात्मागाँधी

Unit II 13 h

कहानीकुंज- डॉवी.पी. 'अमिताभ'(पाठ 1-4)

Unit III 12 h

व्याकरण : शब्दविचार (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: सुमित्रप्रकाशन 204 लीलाअपार्ट्मेंट्स, 15 हेस्टिंग्सरोड'अशोकनगरइलाहाबाद-211001

2 प्रकाशक: गोविन्दप्रकाशनसदरबाजार, मथुराउत्तरप्रदेश-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

Dr.N.G.P. Arts and Science College
APPROVED
BoS- 13th 27/7/22 | AC - 13th 6/9/22 | GB - 18th 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

PathummayudeAdu

Unit II **Novel** 10 h

PathummayudeAdu

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, "PathummayudeAdu" (NOVEL), DC Books & Kottayam
2. T.Padmanabhan, "Nalinakanthi" (Short Story), DC Books & Kottayam.

References

1. MalayalaNovel Sahithyam.
2. MalayalaCherukathaInnale Innu.

Dr.N.G.P. Arts and Science College
APPROVED
BoS- 13th 27/7/22 | AC - 13th 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 deréception et de production orale
• Saluer • Enter en contact • avecquelqu'un. • Se presenter. • S'excuser	Encours 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 deréception 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'adoreI Page 30 12 h

Objectifs de Communication	Tâche	Activités deréception et de production orale
• Exprimerses gouts.	Dans un café, participer à une soirée de rencontres rapides et remplir de taches d'appréciation.	• Dans une soirée de recontresrapid 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'adoreI Page 30 14 h

Objectifs de Communication	Tâche	Activités deréception et de production orale
• Présenterquelqu'un	Dans un café, participer à une soirée de rencontres rapides et remplir de taches d'appréciation	• Exprimersesgoûts. • 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. Parlerd'actions passes. Tuveuxbien?	Organiser un programme d'activités pour accueillirunepersonneimportante.	Comprendreunepersonne 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 RegineMerieux, Yves Loiseau, "LATITUDES - 1" (Page No: 9-55)(Methode de Français), Goyal Publisher &DistributorsPvt.Ltd., 86 UB JawaharNagar (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 ofvaried 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

NiyiOsundare: 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/EFLListening 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)

Dr.N.G.P. Arts and Science College

APPROVED

BoS- 13th	AC- 13th	GB- 18th
27/7/22	6/9/22	10/9/22

References

1. Our Earth Will Not Die By NiyiOsundare." 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	0	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 members – 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", (7thEdn), TMH

2 H. Schildt, 2009, "C: The Complete Reference", 4th Edition, TMH

3 Reema Thareja , 2015, "Programming in C", 2nd Edition, Oxford University Press

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

224CT1A1CP	CORE PRACTICAL : PROGRAMMING IN C	SEMESTER I

Total Credits: 2
Total Instructions Hours: 48 h

S.No	Contents
1	Program to implement basic structure of C with flowchart.
2	Program to implement formatted and unformatted I/O functions with flowchart.
3	Program to implement types of number conversion.
4	Program to implement i) Conditional Operator ii) Bitwise Operator iii) Type Conversion
5	Program to implement various decision making statements.
6	Program to implement iteration statements.
7	Program to implement predefined macros.
8	Program to compute various types of matrix using array
9	i). Program to implement string handling functions. ii). Program to implement category of functions.
10	Program to find the palindrome using pointer
11	Program to implement array of structure
12	Program to implement file operation with command line argument

Dr.N.G.P. Arts and Science College
APPROVED
BoS- 13th 27/7/22 | AC - 13th 6/9/22 | GB - 18th 10/9/22

Note: Out of 12 programs 10 Mandatory

Course Code	Course Name	Category	L	T	P	Credit
224IT1A1CA	DIGITAL COMPUTER FUNDAMENTALS	CORE	4	0	0	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, McGrawHill Education

Course Code	Course Name	Category	L	T	P	Credit
222MT1A1IC	NUMERICAL METHODS AND STATISTICS	IDC	4	1	0	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

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.

BoS Chairman/HoD
Department of Computer Technology
Dr. N.G.P. Arts and Science College
Coimbatore - 641 048

Dr.N.G.P. Arts and Science Col...
APPROVED

BoS - 13th	AC - 13th	GB - 18th
27/7/22	6/9/22	10/9/22

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

Dr.NGPASC
COIMBATORE | INDIA

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

Dr.N.G.P. Arts and Science College		
APPROVED		
BoS- 14th 5/12/2022	AC - 14th 19.01.23	GB - 19th 30.01.23

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

आधुनिक पद्य – शबरी (श्री नरेश मेहता)

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 अपार्ट्मेंट्स, 15 हेस्टिंग्स रोड' अशोक नगर इलाहाबाद. (Unit II)
3. प्रकाशक: राधाकृष्ण प्रकाशन दिल्ली. (Unit III)
4. पुस्तक: व्याकरण प्रदिप – रामदेव प्रकाशक: हिन्दी भवन 36 इलाहाबाद. (Unit IV)
5. प्रकाशक: दक्षिण भारत प्रचार सभा चेनैई. (Unit V)

Dr.N.G.P. Arts and Science College		
APPROVED		
BoS- 14th 05/12/22	AC - 14th 19.01.23	GB - 19th 30.01.23

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	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

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 SuthanMangad, 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. MalayalaNovel Sahithyam, DC Books Kottayam, Kerala, India.
2. MalayalaSahithyaCharithram, National Books Kottayam, Kerala, India.

Dr.N.G.P. Arts and Science College		
APPROVED		
BoS-14th 05/12/22	AC - 14th 19.01.23	GB - 19th 30.01.23

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 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

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.	Organiserune 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 vuepositif et négatif. S'informersur le prix. S'informersur la quantitité. Exprimer la quantitité.	Engroupes, choisir un cadeau pour un ami.	Exprimer son point de vuesur des idées de cadeau. Faire des achatsdans un magasin

Unit IV 14h

Demander etindiquerune 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. Comprendreune chanson. Comprendre de courts messages qui experiment l'obligationoul'interdictio n. Donner des conseils à des personnesdans 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-ImprimeenRoumanie par Canaleen Janvier 2012.(Unit I to IV)

	Dr.N.G.P. Arts and Science College	
	APPROVED	
BoS- 14th 05/12/22	AC -	GB -

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.

Dr.N.G.P. Arts and Science College
APPROVED
RoS-05/12/22 | AC - 14th 19.01.23 | GB - 19th 30/01/23

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 YashavantKanetker, 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

Dr.N.G.P. Arts and Science College

APPROVED

BoS- 14th	AC - 14th	GB - 19th
05/12/22	19/01/23	30/01/23

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 oriented programming 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. Yashavant Kanetkar, 2020, "Let Us C++", BPB Publications.
5. https://www.codecademy.com/
6. https://www.simplilearn.com/

224CT1A2CP	CORE PRACTICAL: PROGRAMMING IN DATA STRUCTURES AND C++	SEMESTER II

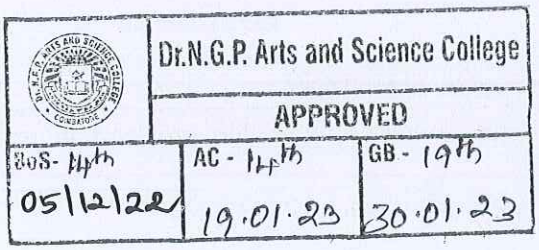
Total Credits: 2
Total Instructions Hours: 48 h

S.No	Contents
1	Program to demonstrate class and member functions
2	Program to demonstrate the usage of constructors, destructors and inline member functions
3	a. Program to implement friend function b. Program to implement virtual function
4	Programs to implement all types of inheritance
5	a. Program to apply string functions b. Program to implement exception handling
6	a. Program to implement templates b. Program to merge two files in to single file
7	Program to convert infix expression to postfix expression
8	Program to implement queue operations
9	Program to implement any one linked list data structure
10	Program that implements sorting algorithms
11	a. Program to implement searching techniques b. Program to implement graph traversal
12	Program to solve the single source shortest path problem using Dijkstra's algorithm

Note: Out of 12 Programs 10 Mandatory

References

1. Balagurusamy. E, 2018, "Object Oriented Programming with C++", 7th Edition, Tata Mc-Graw Hill Publication, New Delhi.
2. Michael T. Goodrich , Roberto Tamassia, David Mount, 2011, "Data Structures & Algorithms in C++", 1st Edition, Wiley Publication
3. Sachi Nandan Mohanty, Parbitra Kumar Tripathy, 2021, "Data Structures and Algorithms using C++", Wiley Publication.
4. Wisnu Anggoro, 2018, "C++ Data Structures and Algorithms", 1st Edition, Packt Publication



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.

Dr.N.G.P. Arts and Science College		
APPROVED		
BoS- 14th 5/12/22	AC - 14th 19.01.23	GB - 19th 30.01.23

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
வலைதள முகவரி : https://www.tamilvu.org.

Dr.N.G.P. Arts and Science College		
APPROVED		
BoS - 14th 05/12/22	AC - 14th 19.01.23	GB - 19th 30.01.23

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

1. தமிழ்நாடு - 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. வலைதள முகவரி : https://www.tamilvu.org

Dr.N.G.P. Arts and Science College

APPROVED

BoS- 14th	AC - 14th	GB - 9th
05/02/22	19.01.23	30.01.23

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. Lalit Parmar, 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 Piyush Diwan, 1994, "Women and Legal Protection", South Asia Books, Andhra Pradesh.
3. Venkataram and 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.

05/12/22
BoS Chairman/HoD
Department of Computer Technology
Dr. N. G. P. Arts and Science College
Coimbatore – 641 048

Dr.N.G.P. Arts and Science College
APPROVED

BoS - 14th	AC - 14th	GB - 19th
05/12/22	19.01.23	30.01.23

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

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 storage 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 Book

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.

224CT1A3SP	SEC PRACTICAL-I: SQL PROGRAMMING	SEMESTER III

Total Credits: 2
Total Instructions Hours: 48 h

S.No	List of Experiments
1	(i) Create the three tables as stated below. Table: DEPARTMENT: deptid (Primary key), deptname (Not null) Table: DESIGNATION: desid (Primary key), designation (Not null) Table: EMPLOYEE: empid (Primary key), empname (Not null), deptid (Reference key), desid (Reference key), gender, dob (Not null), doj (Not null), contactno, managerid, basicpay (Not null) (ii) Insert necessary records in the above tables.
2	Use the DML and DDL statements to (i) update the contact number of an employee. (ii) delete the record of an employee. (iii) add a 'not null' constraint to the column 'gender' in the table 'EMPLOYEE'.
3	Display the employee details (i) of the 'purchase' department. (ii) in ascending order based on the date of joining.
4	Use the grouping functions and group by clause to display, (i) the maximum salary of the employee of each department. (ii) the total salary of the employee of each department. (iii) the departments whose average salary is more than 10000.
5	Use Joins to display, (i) the empid, name, and designation of the employees. (ii) the names of the employees and their managers.

6	(i) Create a view to display the details of the employee along with designation and department details. (ii) Create a cursor to display all employee IDs and names from the EMPLOYEE table.
7	Create a function to find the sum of salaries of all employees working in a department.
8	Write a procedure to update the basic pay of all the employees.
9	Write a database trigger (i) 'before delete for each row' not allowing deletion on EMPLOYEE table and give the appropriate message. (ii) 'before insert for each row' on the table EMPLOYEE not allowing transaction on Saturday / Sunday.
10	Define an exception handling mechanism to handle any exception that occurs (i) when too many rows are fetched inside a PL/SQL block. (ii) when a PL/SQL block receives an invalid employee id.
11	Define a PL/SQL block to lock a number of records before changing the basic pay of the employee.
12	Create a package and define procedures to retrieve, insert, and update records in the employee table.

Note: Mandatory - First program and 9 out of remaining 11 programs

Course Code	Course Name	Category	L	T	P	Credit
225BP1A3IA	CORPORATE CULTURE	IDC	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- Corporate Readiness and Governance.
- Corporate Etiquettes and communication.
- Interview Skills and the Presentations.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Describe the Corporate Readiness and Corporate Governance.	K1
CO2	Distinguish between Campus and corporate and classify the body language.	K2
CO3	Explain the Corporate Etiquettes and their Presentation skills.	K3
CO4	Contrast the Communication and Vocabulary Skills.	K4
CO5	Prepare for Interview Skills and the Presentations.	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

225BP1A3IA	CORPORATE CULTURE	SEMESTER III

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Overview of Corporate 09 h

Corporate Readiness - Overview of Corporate - History of Corporate – Corporate Social Responsibility – Business Ethics –Corporate Governance: Definition - Need – Benefits - Principles – Corporate Governance system worldwide - e- Governance – Trends in e-Governance.

Unit II Attitude and Behavior 09 h

Difference between Campus and Corporate – Change management - Learn the Culture - Impact of your attitude and behavior - Consider the language – Establish and maintain relationship – Respect others - Be Confident - Keep on learning - Consider the body language.

Unit III Corporate Etiquettes 10 h

Corporate Etiquettes – Dressing and grooming skills - Workplace etiquette - Business etiquette - e-Mail etiquette - Telephone etiquette - Meeting etiquette - Presentation Skills - Professional Competencies - Analytical Thinking - Listening Skills - Time management - Team Skills – Assertiveness - Stress Management - Participating in Group Discussion - Interview facing – Ownership - Attention to Detail.

Unit IV Communication 10 h

Communication – Grammar – Phonetics – One on one basic conversation skill practice - Reading Comprehension - Listening Comprehension - Improving Vocabulary - Improving Writing Skills - Comprehension while interacting face to face.

Unit V Interview Skills 10 h

Recitation of short stories - Interview Skills - Group Discussion - Social Conversation Skills – Presentation - One Act Plays.

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

Text Book

1 Course Material – Tata Consultancy Services.

224CT1ASSA	SELF STUDY: MULTIMEDIA AND ANIMATION	SEMESTER III

Total Credits: 1

Syllabus

Unit I Text Concepts

Text: Types of Text – Unicode Standard – Font – Insertion of Text – Text compression – File formats.

Unit II Image Concepts

Image: Image Types – Seeing Color – Color Models – Basic Steps for Image Processing – Scanner – Digital Camera.

Unit III Audio Concepts

Audio: Introduction – Acoustics – Nature of Sound Waves – Fundamental Characteristics of Sound – Microphone – Amplifier – Loudspeaker – Audio Mixer – Digital Audio – Sound Card – Audio Transmission – Audio File formats.

Unit IV Video Concepts

Video: Analog Video Camera – Transmission of Video Signals – Video Signal Formats – Television Broadcasting Standards – PC Video – Video File Formats and CODECs – Video Editing – Video Editing Software.

Unit V Basics of Animation

Animation: Types of Animation – Computer Assisted Animation – Creating Movement – Principles of Animation – Some Techniques of Animation – Animation on the Web.

Text Book

1 Ranjan Parekh, 2013, "Principles of Multimedia", 2nd Edition, TMH Publication.

224CT1ASSB	SELF STUDY: SOCIAL NETWORKING	SEMESTER III

Total Credits: 1

Syllabus

Unit I Introduction to Social Networking

Social Networking: Introduction - History – Features-Types – Impact on Social Networks among people - Advantages of Social Networking - Issues.

Unit II Facebook

Facebook: Evolution of Facebook - Design - Facebook IPO - Five hidden dangers of Facebook - Security tips for users and Application Developers - Facebook Security Settings.

Unit III Google Applications

Google Applications: History of Google apps - Gmail - Calendar - Drive - Docs - Sheets - Slides - Hangouts - Advantages of Google Applications.

Unit IV Mobile Applications

Mobile Applications: Introduction – Definition - Overview - Messenger - Truecaller - Share it - Xender - Adobe reader - INDpay - EPFO.

Unit V Search Engines

Search Engines: Google - Yahoo - Bing - Qwant. P2P Search Engines - Meta Search Engines.

Text Books

1 https://en.wikipedia.org/wiki/Social Networks.

2 http://www.google.com/Google Applications.

BoS Chairman/HoD
Department of Computer Technology
Dr. N. G. P. Arts and Science College
Coimbatore – 641 048

Dr.N.G.P. Arts and Science Co.
APPROVED
BOS - 10/6/23 | AC - 14/7/23 | GB - 5/8/23

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

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

செய்யுள் திரட்டு - மொழிப் பாடம் - 2022- 23

1 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. ° Décrirequelqu'un	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 protocolsused in the layers

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Describethe working of OSI and TCP/IPReference 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
224CT1A4CB	WEB APPLICATION DEVELOPMENT	CORE	3	-	-	3

PREAMBLE

This course has been designed for students to learn and understand

- Creating web pages using HTML and Cascading Styles sheets
- JavaScript basics, objects and events
- XML and AJAX for building web applications

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Discover and understand the basic HTML elements, Tables and Forms to create web pages	K2
CO2	Demonstrate using CSS to format text, colors, background and explore using different layouts.	K2
CO3	Determine the concepts of control statements, functions and arrays in JavaScript	K2
CO4	Use various JavaScript objects and Event handlers while building web applications.	K3
CO5	Develop rich internet applications by gaining knowledge on XML and AJAX	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

224CT1A4CB	WEB APPLICATION DEVELOPMENT	SEMESTER IV

Total Credits: 3

Total Instruction Hours: 36 h

Syllabus

Unit I HTML 7 h

HTML: Creating a simple webpage - Marking Up Text - Lists - Content Elements - The Inline Element - Generic Elements (div and span)- Adding Links - Adding Images.

Tables: Table Markup - Table Structure - Spanning Cells - Table Accessibility - Wrapping Up Tables.

Forms: Working with Forms - The Form Element - Variables and Content - Form Accessibility Features - Form Layout and Design.

Unit II Formatting with CSS 7 h

CSS: Benefits and Working of CSS - Formatting Text - Colors and Background - Element box - Box dimensions - Padding - Borders - Margins - Box drop shadows - Floating and Positioning - CSS layout with flexbox and grid - Responsive web design - Web development tools.

Unit III JavaScript 7 h

Introduction - Getting user input with prompt dialogs - Datatypes - Arithmetic - Decision making - Control Statements: Selection Statement - Repetition Statement - Operators - Loops - Functions - Arrays.

Unit IV JavaScript Objects & Events 7 h

Introduction - Objects: Math, String, Date, Boolean, Number, Document, Window - using JSON to represent objects. DOM: Modeling a document - DOM collections.

JavaScript Events: Registering event handlers - onload and onmouse events - Form processing events

Unit V XML and AJAX 8 h

XML Basics - Structuring data - XML namespaces - DTDs - Extensible stylesheet language and XSL transformation.

AJAX: Introduction - Web applications vs AJAX applications - RIAs with AJAX - XMLHttpRequest object - using XML and DOM - Creating AJAX enabled application

Case Study: Web Application Development using APEX

Text Books

1 Jennifer Niederst Robbins, 2018, " Learning Web Design ", Fifth Edition, O'Reilly Media. (Units I, II)

2 Paul J. Deitel, Harvey M. Deitel, 2009, "JavaScript for Programmers", Pearson Education (Units III, IV and V)

References

1 Kogent Learning Solutions Inc. , 2011, "HTML5 Black Book", Wiley India

2 John Dean, 2018, "Web Programming with HTML5, CSS and JavaScript", Jones & Bartlett Learning

3 https://www.w3schools.com/whatis/

4 https://www.tutorialspoint.com/internet-and-web-programming

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 conceptsof 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	ApplyNumpy 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 readand 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 and5].

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,RaghavBali,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.

224CT1A4SP	SEC PRACTICAL: WEB PROGRAMMING	SEMESTER IV

Total Credits: 2
Total Instructions Hours: 48h

S.No	Contents
1	Design a webpage to play a promotion video
2	Design a web page to submit an application form.
3	Demonstrate the usage of internal and external style sheet using CSS.
4	Design a webpage to illustrate positioning and layout optionsusing CSS.
5	Design a webpage to apply different types of shadow effects to objects using CSS.
6	JavaScript program for a simple calculator.
7	JavaScript program to print squares and cubes of numbers from 1 to 10.
8	JavaScript program to illustrate the onload and onmouse events
9	JavaScript program to design a login form and validate the credential patterns.
10	Validate an XML document using DTD
11	Display XML Data using XSLT
12	Fetch information from an XML file with AJAX

Note: Out of 12 - 10 Mandatory

References

1. David DuRocher, 2021, "HTML / CSS QuickStart Guide", Clydebank Media LLC
2. Robin Nixon, 2012, "Learning PHP, MySQL, Javascript and CSS", O'Reilly Publication, 2nd Edition
3. Heather Williamson, 2008, "XML the complete Reference ",11th reprint, TMH
4. Deitel and Deitel and Nieto, 2011,"Internet and World Wide Web - How to Program", 5th Edition, Prentice Hall.

Course Code	Course Name	Category	L	T	P	Credit
225BI1A4IB	SOCIAL MEDIA MARKETING	IDC	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- The basics of Digital Marketing and Social Media Marketing
- The knowledge to develop strategies for Social Media Marketing
- The innovative trends and best practices of the Social Media.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Acquire the basic knowledge of Digital Marketing	K2
CO2	Understand to develop Online Advertising	K2
CO3	Know about the Email Marketing and Mobile Marketing Tools	K3
CO4	Understand the Social Media Marketing plan and its tools	K2
CO5	Acquire Knowledge about the Search Engine Optimization Process	K2

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

225BI1A4IB	SOCIAL MEDIA MARKETING	SEMESTER IV

Total Credits: 4
Total Instruction Hours: 48 h

Syllabus

Unit I Social Media Marketing 9 h

Introduction - Features of SMM - Advantages and Disadvantages of SMM - Requisites for a Successful Social Media Marketer - Social Media Marketing plan - Social Media marketing Platforms - Facebook - Twitter - Social Media marketing Tools - Publishing Blogs - Podcast and Webinars - Google Ads, Canva, Adobe.

Unit II Search Engine Optimization (SEO) 9 h

Introduction-Understanding SEO - Search Engine Activities- Search Engine Optimization Process – Search Engine Optimization Goals - On-Page Optimization - Off-Page Optimization and Analyze - Search Engine Result Process (SERP) - Search Engine Optimization Tools.

Unit III Digital Marketing 10 h

Introduction of Digital Marketing - Characteristics of Digital Marketing - Benefits of Digital Marketing - Differences between Traditional Marketing and Digital Marketing - Technology behind Digital Marketing - Digital Marketing Strategy - Understanding Digital Consumer

Unit IV Online Advertising 10 h

Introduction - Objective -Online Advertising Tools-Affiliate Marketing -Affiliate Marketing Eco System-Online AdFormat - Search Engine Advertising - Objectives-Network Advertising - Pros and Cons-Pricing Structure- Google Display Network-Landing Pages-Types-Importance..

Unit V E mail Marketing and Mobile Marketing 10 h

Introduction - Types of Email - Email Marketing Campaign Process - Advantages and Disadvantages - Opt-in Email Advertising -Email marketing Tools - Email tracking - Email Tracking Tools - Mobile Marketing- Goals-App Creation Strategy-Types of Mobile Marketing Strategies.

Text Books

1 Nitin Kamat, Chinmay Nitin Kamat,2017,"Digital Marketing", First Edition 2017,Himalaya Publishing House, Mumbai.

2 Gordon E and Natarajan 2019 Banking Theory Law and Practices(Twenty Seventh Edition) Himalaya Publishing house, New Delhi.

References

1. Abhishek Das, 2018, "Application of Digital Marketing", First Edition , BPB Publications, Mumbai
2. Liana Li Evans, 2011, Social Media Marketing, First Edition , Pearson India Education Services Pvt Ltd, Uttar Pradesh.
3. Seema Gupta, 2021, Digital Marketing, Second Edition , McGraw Hill Education (India) Private Limited, Chennai
4. Dishek J Mankad, 2018, Understanding Digital Marketing Strategies for Online Success, First Edition , BPB Publications, Mumbai.

17/10/23

BoS Chairman/HoD
Department of Computer Technology
Dr. N. G. P. Arts and Science College
Coimbatore – 641 048

Dr.N.G.P. Arts and Science College

APPROVED

BoS- 16th	AC - 16th	GB - 21st
17.10.23	13.12.2023	05.01.2024

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

Course Code	Course Name	Category	L	T	P	Credit
224CT1A5CA	SOFTWARE ENGINEERING AND TESTING	CORE	4	1	-	4

PREAMBLE

This course has been designed for students to learn and understand

- The basics of Software engineering and Requirements engineering.
- The concepts of Design, Architectural engineering and to learn Software Coding and Metrics.
- Software Testing strategies, Testing Automation, and Software Maintenance.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the basics of Software engineering and requirements engineering principles and modeling.	K2
CO2	Infer the knowledge on Design and Architectural engineering.	K2
CO3	Interpret the knowledge on Software Coding and identify the Software Metrics and estimation process.	K2
CO4	Discuss the Software Testing strategies for conventional and web applications	K2
CO5	Build knowledge on Test Cases, Testing Automation and Software Maintenance.	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

224CT1A5CA	SOFTWARE ENGINEERING AND TESTING	SEMESTER V

Total Credits: 4

Total Instruction Hours: 60 h

Syllabus

Unit I Introduction to Software Engineering 13 h

Software Engineering: Introduction - Components of Software - Role of Software - Phases of Software - Characteristics of Software - Changing nature of Software - Software Myths - Generic view of Software Engineering - Role of Management Software Engineering - Software Process - Process Models - Software Product.

Requirements Engineering: Principles: Requirements Engineering - Importance of requirements - Types of requirements - Steps Involved. Modeling: Analysis modeling - Structured analysis - Object Oriented analysis.

Unit II Design and Architectural Engineering 12 h

Design and Architectural Engineering: Design process and concepts - Basic issues in Software Design - Characteristics of a good design - Software Design and Software Engineering - Function-Oriented System vs Object-Oriented System - Modularity, Cohesion, Coupling, Layering.

User Interface Design: Concepts - Elements - Designing the User Interface.

Unit III Software Coding & Metrics 12 h

Software Coding: Programming Principles - Programming Guidelines - Coding Conventions - Key Concepts.

Software Metrics and Estimation: Introduction - Measurement - Metrics - Lines of Code - Function Point Count. Software Estimation: Definition - Importance of Accurate Estimation - Efforts and Duration - Estimation Process.

Unit IV Software Testing 13 h

Software Testing: A Strategic Approach to Software Testing - Strategic Issues - Test Strategies for Conventional Software - Validation Testing - System Testing.

Testing Conventional Applications: White-Box Testing - Basis Path Testing - Control Structure Testing - Black-Box Testing.

Testing Web Applications: Testing Concepts for WebApps - The Testing Process - Content Testing - User Interface Testing - Component-Level Testing - Configuration Testing - Security Testing - Performance Testing.

Unit V Test Automation and Software Maintenance 10 h

Software Testing Plan and Test Case Preparation: Introduction - Test Plan - Test Case.

Test Automation: Expectations from Test Automation - Limitations - Automation Strategy - Automation Frameworks - Automation Metrics.

Software Maintenance: Introduction - Maintenance Activities - Maintenance Process - Maintenance Cost - Maintenance Strategies.

Text Books

1 Saikat Dutt, Chandramouli Geetha, Chandramouli Subramanian, 2015, "Software Engineering", Pearson Education, India (Units I, II, III, V).

2 Roger S. Pressman and Bruce Maxim, 2022, "Software Engineering, A Practitioner's Approach", 11th Edition, Mc Graw Hill, International Edition (Units IV).

References

1 Sommerville , 2017, "Software Engineering", Tenth Edition, Pearson Education.

2 Mathur Aditya P, 2013, "Foundations of Software Testing", Second Edition, Pearson

3 Rajib Mall, 2015, "Fundamentals of Software Engineering", Fifth Edition, PHI.

4 https://www.tutorialspoint.com/software_engineering/index.html

Course Code	Course Name	Category	L	T	P	Credit
224IT1A5CB	CYBER SECURITY AND ETHICS	CORE	4	1	-	4

PREAMBLE

This course has been designed for students to learn and understand

- The objective of this course is to focus on the models, tools, and techniques for enforcement of security.
- Develop an understanding of security policies as well as protocols to implement such policies
- Will gain familiarity with computer network, defenses against them.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the foundations of Cyber security and threat landscape	K3
CO2	To equip students with the technical knowledge and skills needed to protect and defend against cyber threats and Mobile threats.	K3
CO3	To expose students to governance, regulatory, legal, economic, environmental, social and ethical contexts of cyber security	K4
CO4	To systematically educate the necessity to understand the impact of cyber crimes and threats with solutions in a global and societal context..	K4
CO5	To select suitable ethical principles and commit to professional responsibilities and human values and contribute value and wealth for the benefit of the society	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

224IT1A5CB	CYBER SECURITY AND ETHICS	SEMESTER V

Total Credits: 4

Total Instruction Hours: 60 h

Syllabus

Unit I Introduction to Cyber Security 12 h

Cyber Security and Cybercrime Definition and Origins of Cybercrime of the World - Cybercrime and Information Security - Classifications of Cybercrime with Cyber Security, Cybercrime and the Indian IT Act,2000. Global Perspective on Cybercrimes. Cyber Offences & Cybercrime: Cyber Offences - Introduction to Cybercrime - Cyber Security Strategic Attacks.

Unit II Computer Crime and Security 12 h

Computer Crime hacking and Security - Computer as Commodities - Theft of Intellectual Property. Identity Theft and Identity Fraud: Typologies of Internet Theft/ Fraud - Prevalence and Victimology - Physical Methods of Identity Theft - Virtual or Internet Facilitated Methods - Crimes Facilitated by Identity Theft/Fraud

Unit III Cyberattacks and Security Breach 12 h

Attacks that Inflict Damage - Impersonation-Data Theft – Malware - Web Service Attacks - Malvertising-Advanced Attacks - Identifying Security Breach: Identifying-Detecting Convert Breaches. Recovering from a security Breach: Reinstall Damage software - Stolen Information. Resetting your Device

Unit IV Cyberspace and Cyber Law 12 h

Aspects in Cyber Law - Security Aspects of Cyber Law- Intellectual Property Aspects in Cyber law and Evidence - Criminal Aspects in Cyber Law - Global Trends in Cyber Law. Legal framework for Electronic Data Interchange Law. Cybercrime and Cyber Security: Cyberspace - Cyber law - Cyber Security Policy.

Case Study : Cyber Security Threats in Payment Gateway

Unit V Overview of Ethics 12 h

Ethics : Human values and Professional Ethics - Ethics in the Business World - Corporate Social Responsibility - Fostering Corporate Social Responsibility and Good Business Ethics - Improving Business Ethics - Ethical Considerations in Decision Making - Ethics in Information Technology. Professional Codes of Ethics - Professional Organizations - Certifications and Licensing - Encouraging Ethical Use of IT Resources among Users.

Text Books

1. Nilakshi Jain , Ramesh Menon, "Cyber Security and Cyber Laws" , Publications: Wiley India Pvt. Ltd., First Edition, 2021
2. Marjie T.Britz ,"Computer Forensics and Cyber Crime" , Second Edition, 2022 Pearson
3. Joseph Steinberg, "Cybersecurity for Dummies",Edition 2020 – Wiley Publication.

References

1. George Reynolds , "Ethics in Information Technology", Cengage Learning Publication, 6th Edition, 2019
2. Cyber Security Understanding Cyber Crimes, Computer Forensics and Legal Perspectives by Sumit Belapure and Nina Godbole, Wiley India Pvt. Ltd. 2010
3. https://www.ugc.gov.in/pdfnews/5457035_Cyber-Security-Final.pdf
4. Cyber Ethics 4.0, Christoph Stuckelberger, Pavan Duggal, by Globethic

Course Code	Course Name	Category	L	T	P	Credit
224CT1A5CB	PHP PROGRAMMING	CORE	4	1	-	4

PREAMBLE

This course has been designed for students to learn and understand

- The basic concepts, Control Flow, Strings and Arrays using PHP.
- The Functions and Object-Oriented Programming Concepts in PHP
- Working with Web Services and databases in PHP.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the basics of PHP and write simple PHP scripts.	K2
CO2	Demonstrate the Usage of Functions and Strings in PHP.	K3
CO3	Apply the concept of Arrays and the usage of Objects in PHP to build organized and scalable web applications	K3
CO4	Demonstrate the use of web Techniques to maintain a stateful interactions between client and server using Session and Cookies.	K3
CO5	Develop applications using web services and PHP's database integration capabilities.	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

224CT1A5CB	PHP PROGRAMMING	SEMESTER V

Total Credits: 4

Total Instruction Hours: 60 h

Syllabus

Unit I Introduction to PHP, Language Basics 10 h

Introduction to PHP - Language Basics: Lexical Structure - Data Types - Variables - Expression and Operators - Flow-Control Statements - Including Code - Embedding PHP in Web Pages.

Unit II Functions, Strings 12 h

Functions: Calling a Function - Defining a Function - Variable Scope - Function Parameters - Return Values - Variable Functions - Anonymous Functions.

Strings: Quoting String Constants - Printing Strings - Accessing Characters - Encoding and Escaping - Comparing Strings - Manipulating and Searching Strings - Regular Expressions.

Unit III Arrays, Objects 12 h

Arrays: Indexed Versus Associative Arrays - Identifying Elements of an Array - Storing Data in Arrays - Multidimensional Arrays - Extracting Multilpe Values - Arrays and Variables Conversion - Traversing Arrays - Sorting - Implementing Iterator Interface.

Objects: Terminology - Creating an Object - Accessing Properties and Methods - Declaring a Class - Anonymous Class - Introspection - Serialization.

Unit IV Web Techniques, Debugging PHP 12 h

Web Techniques: HTTP Basics - Variables - Server Information. Processing Forms: Methods - Parameters - Self-Processing Pages - Sticky Forms - Multivalued Parameters - File Uploads - Form Validation. Setting Response Headers: Different Content Types - Redirections - Expiration - Authentication. Maintaining State: Session - Cookies - Combining Cookies and Sessions.

Debugging PHP: Error Handling - Error Reporting - Exceptions - Error Suppression - Triggering Errors - Defining Error Handlers.

Unit V Web Services and Databases 14 h

Web Services: REST Clients : Responses - Manipulating Resources. XML-RPC: Servers - Clients.

Database: Essential SQL - Creating a MYSQL Database - Creating a New Table - Inserting Records. Connecting PHP and MySQL: Accessing the Database in PHP - Updating Databases - Inserting Data - Deleting Records - Creating New Tables - Creating a New Database - Sorting Data.

Text Books

1 Kevin Tatroe, Peter Maclntyre, 2021, "Programming PHP: Creating Dynamic Web Pages", Fourth Edition, O'REILLY (Unit I - IV)

2 Steven Holzner, 2019, "The Complete Reference PHP", McGraw Hill Education (Unit V)

References

1 Richard Blum, 2021, "PHP, MySQL & JavaScript All-in-One for Dummies", Wiley Publishers

2 Vikram Vaswani, 2014, "PHP A Beginner's Guide", McGraw Hill Education

3 Steve Suehring, Tim Converse and Joyce Park ,2013, "PHP6 and MySQL Bible", Wiley Publishers

4 Lynn Beighley, Michael Morrison, 2009, "Head First PHP & MySQL", O'Reilly Media, Inc.,

224CT1A5CP	CORE PRACTICAL : PROGRAMMING IN PHP	SEMESTER V

Total Credits: 2
Total Instructions Hours: 48 h

S.No	Contents
1	Write a PHP program using expression and operators.
2	Write a PHP program to demonstrate the use of decision-making statements.
3	Write a PHP program to demonstrate the use of looping structures
4	Write a PHP program to implement built-in functions.
5	Write a simple PHP program to demonstrate use of simple function and parameterized function.
6	Write a PHP program for creating and manipulating: i) Indexed Array ii) Associative Array iii) Multidimensional Array
7	Write a PHP program to perform various string manipulations
8	Write a PHP program to implement OOP concepts. (Introspection, serialization)
9	Write a PHP program to process forms.
10	Write a PHP program to demonstrate session management.
11	Develop a simple application to manipulate the data in database.
12	Develop a User Registration form using REST webservice.

Note: Out of 12 - 10 Mandatory

References

1 Kevin Tatroe, Peter Maclntyre, 2021, "Programming PHP Creating Dynamic Web Pages", O'REILLY

2 Steve Suehring, Tim Converse and Joyce Park ,2013, "PHP6 and MySQL Bible", Wiley Publishers

3 Vikram Vaswani 2018, "PHP A Beginner's Guide", McGraw Hill Education

4 Steven Holzner, 2019, "The Complete Reference PHP", McGraw Hill Education

224CT1A5SP	SEC PRACTICAL: ANDROID APPLICATION DEVELOPMENT	SEMESTER V

Total Credits: 2
Total Instructions Hours: 48 h

S.No	Contents
1	Design a mobile app UI to upload a resume. Use appropriate views and view groups to read the inputs.
2	Design a login UI on (i) relative layout (ii) table layout (iii) constraint layout.
3	Create a mobile application using ListView to display the countries along with its flag.
4	Create an image gallery app using GridView.
5	Create an app implementing fragment.
6	Create an app to show the progress of a process implementing progress bar.
7	Create an app implementing (i) option menu (ii) context menu (iii) pop-up menu
8	Create a mobile app implementing implicit and explicit intents.
9	Create animation effects on a mobile app.
10	Create an app to play video.
11	Develop a personal database using SQLite to store and access the job seeker's data.
12	Display the data of student using JSON parsing.
13	Mini project.

Note: 10 out of 12 Programs Mandatory

References

1 John Horton, 2018, "Android Programming for Beginners", Second Edition, Packet Publication

2 Rick Boyer, 2018, "Android 9 Development Cookbook", Third Edition, Packt Publishing Ltd

3 https://abhiandroid.com/

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

Course Code	Course Name	Category	L	T	P	Credit
224CT1A5DA	DATA MINING TECHNIQUES	DSE	4	1	-	4

PREAMBLE

This course has been designed for students to learn and understand

- The basic concepts of data mining process and preprocessing methods
- Different classification methods and cluster analysis
- The association rule mining techniques and the trends in data mining

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the data mining techniques and preprocessing methods.	K2
CO2	Infer various classification algorithms and assessment metrics for classification	K2
CO3	Demonstrate cluster analysis using different clustering algorithms	K2
CO4	Apply association rule mining and web mining for finding hidden and interesting patterns in data	K3
CO5	Identify the principles of mining complex data types and the applications of data mining.	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

224CT1A5DA	ELECTIVE: DATA MINING TECHNIQUES	SEMESTER V

Total Credits: 4

Total Instruction Hours: 60 h

Syllabus

Unit I Data Mining Introduction 12 h

Introduction to Data Mining – Architecture - Need of Data Mining - Data objects and attribute types – Statistical description of data - Measuring data similarity and dissimilarity - Data Mining Applications - Data Mining Process - Data Mining Techniques.

Data Preprocessing: Need for Data Preprocessing - Data Preprocessing Methods: Data Cleaning – Data integration– Data reduction– Data transformation and discretization

Unit II Classification 12 h

Classification: Introduction – Decision Tree Induction – Bayes Classification – Rule Based Classification - Model Evaluation and Selection – Classification by back propagation – Support Vector Machines - Assessment Metrics for Classification -Techniques to improve classification accuracy

Unit III Cluster Analysis 12 h

Cluster Analysis: Introduction – Applications of Cluster Analysis – Desired Features of Clustering – Distance Metrics – Clustering Methods : K-Means Clustering – K-Medoids - Agglomerative Clustering – Divisive Clustering - Density Based Clustering - DBSCAN Algorithm – Evaluation of Clustering.

Unit IV Association Rule and Web Mining 12 h

Mining frequent Patterns: Market Basket Analysis – Frequent Itemsets, Closed Itemsets and Association Rules. Frequent Itemset Mining Methods: Apriori Algorithm – Generating Association Rules from Frequent Itemsets

Web Mining and Search Engine: Introduction – Web Content Mining – Web Usage mining - Web Structure Mining - Working of a Search Engine - Page Ranking Algorithm

Unit V Data Mining Trends 12 h

Mining complex datatypes: Mining sequence data – Spatial-temporal data - Graphs and Networks. Methodologies of data mining: Statistical data mining – Visual and Audio data mining.

Data mining applications: Financial data analysis – Retail and Telecommunication industries – Science and Engineering – Intrusion Detection and Prevention – Sentiment and Opinion - Recommendation systems.

Text Books

1 Jiawei Han, Micheline Kamber , Jian Pei, 2011, "Data Mining Concepts and Techniques", Morgan Kaufmaan Publishers.

2 Parteek Bhatia, 2022, "Data Mining and Data Warehousing", Cambridge University Press

References

1 Jiawei Han, Jian Pei , Hanghang Tong, 2022, "Data Mining : Concepts and Techniques", 4th Edition, Morgan Kaufmann Publishers.

2 Max Bramer, 2020, "Principles of Data Mining", Fourth Edition, Springer

3 Arun K. Pujari, 2016, "Data Mining Techniques", Fourth Edition, Orient Blackswan publishers.

4 Pang-Ning Tan, Michael Steinbach, Vipin Kumar, 2016, "Introduction to Data Mining", First Edition, Pearson education.

Course Code	Course Name	Category	L	T	P	Credit
224CT1A5DB	DISTRIBUTED COMPUTING	DSE	4	1	-	4

PREAMBLE

This course has been designed for students to learn and understand

- the basic concepts and types of distributed systems
- the architecture design, processes and communication of distributed systems.
- The coordination, fault tolerance methods and security concepts

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the design goals and types of distributed systems.	K2
CO2	Discover the architectural styles and system architecture of distributed systems	K2
CO3	Infer the threads, virtualization process and communication in distributed systems	K2
CO4	Interpret various distributed algorithms related to clock synchronization, learn consistency models and replica management	K3
CO5	Examine fault tolerance, security policies and mechanisms in distributed systems.	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

224CT1A5DB	ELECTIVE: DISTRIBUTED COMPUTING	SEMESTER V

Total Credits: 4

Total Instruction Hours: 60 h

Syllabus

Unit I Introduction 10 h

Introduction: Distributed system - Characteristics - Middleware and distributed systems - Design goals: Resource sharing - Distribution transparency - Scaling - Types of distributed systems: High performance distributed computing - Distributed information systems - Pervasive systems

Unit II Architectures 12 h

Architectural styles: Layered architectures - Object-based and service-oriented architectures – Resource based architectures – Publish-subscribe architecture - Middleware organization - System architecture: Centralized organizations - Peer-to-peer systems - Hybrid Architectures – Network File System - Web

Unit III Processes & Communication 14 h

Threads: Introduction - Threads in distributed systems - Virtualization: Principle of virtualization - Application of virtual machines to distributed systems - Clients – Servers – Types of Communication - Remote procedure call: Basic RPC operation - Parameter passing - Message-oriented communication: Simple transient messaging with sockets - Message-oriented persistent communication

Unit IV Coordination, Consistency and Replication 12 h

Clock Synchronization: Physical Clocks – Lamport's Logical Clocks – Distributed Mutual Exclusion algorithm – Consistency and replication: Reasons for replication – Replication as scaling technique – Data centric consistency models - Client-centric consistency models – Replica management

Unit V Fault Tolerance & Security 12 h

Fault Tolerance: Introduction – Failure models – Reliable client server communication – Distributed commit – Recovery - Security: Security threats, policies, and mechanisms - Design issues - Cryptography - Authentication - Message integrity and confidentiality - Security management

Text Books

1 Maarten van Steen, Andrew S. Tanenbaum, 2017, "Distributed Systems", Third edition, CreateSpace Independent Publishing Platform

References

1 Roberto Vitillo, 2022, "Understanding Distributed Systems", Second Edition

2 Sukumar Ghosh, 2014, "Distributed Systems An Algorithmic Approach", Second Edition, CRC Press

3 George Coulouris, Jean Dollimore, Time Kindberg, 2012, "Distributed Systems Concepts and Design", Fifth Edition, Pearson Education.

4 George F. Coulouris, Jean Dollimore, Tim Kindberg, Gordon Blair, 2012, "Distributed Systems: Concepts and Design", Addison-Wesley

5 A.D. Kshemkalyani, M. Singhal, 2011, " Distributed Computing: Principles, Algorithms and Systems", Cambridge University Press.

Course Code	Course Name	Category	L	T	P	Credit
224CT1A5DC	SERVICE ORIENTED ARCHITECTURE	DSE	4	1	-	4

PREAMBLE

This course has been designed for students to learn and understand

- The fundamentals of Service Orientation and its architecture
- The lifecycle of SOA projects and the layers with services and microservices
- The service-oriented analysis and design

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Outline the fundamentals of service orientation and its architecture	K2
CO2	Interpret the characteristics of SOA and the lifecycle of SOA projects	K2
CO3	Infer the service models and service layers, and building up a service-oriented solution	K2
CO4	Analyzing and modeling of webservices and REST services	K3
CO5	Inspect the design consideration and versioning of web services and REST services	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

224CT1A5DC	ELECTIVE: SERVICE ORIENTED ARCHITECTURE	SEMESTER V

Total Credits: 4

Total Instruction Hours: 60 h

Syllabus

Unit I Fundamentals of SOA 10 h

Introduction: Service-Orientation as a Design Paradigm - Service-Orientation Design Principles - Problems Solved by Service-Orientation - Service-Orientation and Application - Service-Orientation Integration – Service Composition - Goals and benefits of Service Oriented computing – Pillars of Service Orientation

Unit II Architecture and SOA Project lifecycle 14 h

Characteristics of SOA – Types of SOA: Service Architecture - Service Composition Architecture - Service Inventory Architecture - Service-Oriented Enterprise Architecture.

SOA Project and lifecycle stages: SOA Project stages - SOA Adoption Planning - Service Inventory Analysis - Service-Oriented Analysis – Service Oriented Design – Service Logic Design - Service Development - Service Testing – Service Deployment and Maintenance - Service usage and Monitoring - Service Discovery - Service Versioning and Retirement.

Unit III Service Layers 12 h

Service Models and Service Layers - Breaking Down the Business Problem: Functional Decomposition - Service Encapsulation - Agnostic Context - Agnostic Capability - Utility Abstraction - Entity Abstraction - Non-Agnostic Context - Micro Task Abstraction and Microservices - Process Abstraction and Task Services.

Building Up the Service-Oriented Solution: Service-Orientation and Service Composition - Capability Composition and Capability Recomposition - Logic Centralization and Service Normalization.

Unit IV Service Oriented Analysis and Design 12 h

Analysis and modelling with web services and Microservices: Web Service Modeling Process - Case Study Example - Steps in Web Service Modelling.

Analysis and modelling with REST services and Microservices: REST Service Modeling Process - Case Study Example - Steps in REST Service Modelling.

Unit V Service API and Contract Design 12 h

Web Services: Service Model Design Considerations: Entity Service Design - Utility Service Design - Microservice Design - Task Service Design - Web Service Design - Case study Example

REST Services and Microservices: Service Model Design Considerations: Entity Service Design - Utility Service Design - Microservice Design - Task Service Design - Case Study Example.

Versioning with Webservices and REST Services: Versioning Basics - Versioning and Compatibility

Text Books

1 Thomas Erl, 2016, "Service Oriented Architecture: Analysis and Design for Services and Microservices", Second Edition, Pearson Education

References

1 M. Papazoglou, 2012, "Web Services & SOA: Principles and Technology", Second Edition, Pearson Education

2 Irakli Nadareishvili, Ronnie Mitra, Matt McLarty, and Mike Amundsen, 2016, "Microservice Architecture: Aligning Principles, Practices, and Culture", First Edition, O'Reilly

3 Thomas Erl, 2005, "Service Oriented Architecture: Concepts, Technology and Design", First Edition, Pearson Education

224CT1A5GA	GENERIC ELECTIVE: WEB DEVELOPMENT ESSENTIALS	SEMESTER V

Total Credits: 2

Total Instruction Hours: 24 h

Syllabus

Unit I HTML 5 h

HTML Document Structure - Marking Up Text: Paragraphs - Headings - Lists - Content Elements - The Inline Element - Generic Elements (div and span).

Tables: Table Markup - Table Structure - Spanning Cells - Table Accessibility - Wrapping Up Tables

Unit II Forms 5 h

Working with Forms - The Form Element - Variables and Content - The Great Form Control Roundup - Form Accessibility Features - Form Layout and Design.

HTML5 updates: Markup - Meet the APIs - Video and Audio - Canvas.

Unit III Formatting with CSS 5 h

Cascading Style Sheets: Introduction - Benefits and Working of CSS.

Formatting Text: Basic Font Properties - Colors and Background: Pseudo-class Selectors - Gradients - External Style Sheets.

Padding, Borders, and Margins: The Element Box - Box Dimensions - Display Roles - Adding Drop Shadows to Boxes.

Unit IV Page layout with CSS 4 h

Floating and Positioning: Normal Flow - Floating - Fancy Text Wrap with CSS Shapes- Positioning Basics - Relative Positioning - Absolute Positioning - Fixed Positioning.

Unit V Automatic Web Design Tools 5 h

Wix: Set Up Site - Customize the Layout - Add and Edit Media - Optimize Design.

Canva: Create and publish responsive websites using template.

Text Books

1 Jennifer Niederst Robbins, 2018, " Learning Web Design ", Fifth Edition, O'Reilly Media.

2 David DuRocher, 2021, "HTML / CSS QuickStart Guide", Clydebank Media LLC.

References

1 Gopalan NP and Akilandeswari J., 2011, "Web Technology", Prentice Hall of India

2 https://www.wix.com/blog/10-wix-essential-tutorials

3 https://www.canva.com/designschool/tutorials

3/4/24

BoS Chairman/HoD
Department of Computer Technology
Dr. N. G. P. Arts and Science College
Coimbatore – 641 048

Dr.N.G.P. Arts and Science Co
APPROVED
BoS- 17th 3/4/24
AC - 14th 17/4/24
GB -

Academic Council
17/4/2024
CHAIRMAN
Dr.N.G.P. Arts and Science College

Course Code	Course Name	Category	L	T	P	Credit
224CT1A6CA	R FOR ANALYTICS	CORE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- fundamentals of R
- concepts of loading, data handling and exploring data in R
- Regression and Time Series in R.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the fundamental concepts of R.	K2
CO2	Interpret how to handle data and methods for reading data.	K2
CO3	Identify and summarize data to perform preliminary data cleaning and analysis.	K2
CO4	Develop knowledge on linear and logistic regression models.	K3
CO5	Identify the methods to work with time series data.	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

224CT1A6CA	R FOR ANALYTICS	SEMESTER VI

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Introduction to R 10 h

Introduction - Downloading and Installing R - Integrated Development Environment (IDE) and Text Editors - Handling Packages. Getting Started with R: Directory commands - Data Types - Commands for Data Exploration. Loading Data: Introduction - Challenges of Analytical Data Processing - Expression, Variables and Functions - Manipulating text - Missing Values treatment - 'as' Operator.

Unit II Handling Data 10 h

Handling data: Vectors - Matrices - Factors - List - Analytical Tasks - Aggregating and Group Processing of a Variable - Describe Data and Variable structure. Methods for Reading Data: CSV and Spreadsheets - Packages - Web/APIs - JSON document - XML file.

Unit III Exploring Data 8 h

Introduction - Data Frames - R Functions in Data Frames - Load Data Frames - Exploring Data - Data Summary - Missing Values - Invalid Values and Outliers - Descriptive Statistics - Spotting Problems in Data with Visualization.

Unit IV Linear and Logistic Regression 10 h

Linear Regression: Introduction - Model Fitting - Linear Regression - Assumptions of Linear Regression - Validating Linear Assumption. Logistic Regression: Introduction - Generalized Linear Models - Logistic Regression - Diagnosing Logistic Regression - Binary Regression - Multinomial Regression - Case Study.

Unit V Time Series 10 h

Time Series Data: Introduction - Commands for data visualization and manipulation - Reading Time Series data - Plotting Time Series data, Decomposing Time Series data - Forecasts Using Exponential Smoothing: Simple, Holt's, Holt-Winters - Selecting a candidate ARIMA model- Forecasting using an ARIMA model - Case Study.

Text Books

1 Seema Acharya, 2018, "Data Analytics using R", First Edition, McGraw Hill Education (India) Private Limited.

References

1 Hadley Wickham, Garrett Grolemund, 2017, "R for Data Science: Import, Tidy, Transform, Visualize, and Model Data Paperback", O'Reilly Publishers.

2 Robert L. Kabacoff, 2015, "R in Action", Second Edition, Dreamtech Press Publisher.

3 Mike McGrath, 2023, "R for Data Analysis in Easy Steps - R Programming Essentials", Second Edition, In Easy Steps Limited.

Course Code	Course Name	Category	L	T	P	Credit
224CT1A6CB	BLOCKCHAIN TECHNOLOGY ESSENTIALS	CORE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- the essentials of Blockchain and the potential of decentralized applications.
- the security techniques.
- the working of Blockchain with allied technologies.

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 Blockchain and recognize how it operates as a distributed technology.	K2
CO2	Interpret the structure, function of distributed databases and Ethereum	K2
CO3	Discover the importance of Cryptography in Blockchain.	K2
CO4	Infer the working of bit coins and Blockchain use cases.	K2
CO5	Analyze the allied technologies of Blockchain.	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

224CT1A6CB	BLOCKCHAIN TECHNOLOGY ESSENTIALS	SEMESTER VI

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Blockchain 8 h

Blockchain: History - Definition - Fundamentals - Characteristics - Distributed Ledger Technologies (DLT) - DLT Decentralized Applications and Databases - Architecture of Blockchain - Transactions - Chaining Blocks - Value Proposition of Blockchain Technology.

Unit II Decentralized System 10 h

Decentralized System: Distributed Decentralized Databases - Decentralized Enterprise - Decentralization. Ethereum: History - Ethereum Virtual Machine - Working of Ethereum - Ethereum Transactions - Ethereum Development Tools. Consensus: Approach, Algorithms.

Unit III Security 8 h

Cryptography: Primitives - Symmetric Cryptography - Asymmetric Cryptography. Hash Functions: Hashing - Message Authentication Code - Secure Hash Algorithms (SHA-1) - Distributed Hash Tables - Hashing and Data Structures.

Unit IV Bitcoins 12 h

Smart Contracts - Characteristics. Bitcoins: Introduction - Working of Bitcoin - Bitcoin Block Structure - Bitcoin Transactions - Bitcoin Network - Bitcoin Wallets - Bitcoin Payments - Bitcoin Clients - Bitcoin Supply. Blockchain Vertical Solutions and Use Cases: Blockchain in Insurance - Healthcare - Assets Management - Smart Assets - Electronic Currency - Manufacturing.

Unit V Blockchain and Allied Technologies 10 h

Blockchain and Cloud Computing - Characteristics of Blockchain Cloud - Blockchain and Artificial Intelligence - Blockchain and IoT - Blockchain and Machine Learning - Blockchain and Robotic Process Automation.

Text Books

1 Kumar Saurabh, Ashutosh Saxena, 2020, "Blockchain Technology: Concepts and Applications", First Edition, Wiley Publishers.

References

1 Michael Juntao Yuan, 2020, "Building Blockchain Apps", First Edition, Pearson Education.

2 Bikraditya Singhal,Gautam Dhameja, Priyansu Sekhar Panda, 2018, "Beginning Blockchain", APress.

3 Don Tapscott, Alex Tapscott, 2016, "Blockchain Revolution: How the Technology behind Bitcoin and other Cryptocurrencies is changing the world", Portfolio Penguin.

4 Josh Thompson, 2017, "Blockchain: The Blockchain for Beginnings, Guide to Blockchain Technology and Blockchain Programming", Create Space Independent Publishing Platform.

224CT1A6SP	SEC PRACTICAL: ANALYTICS USING R	SEMESTER VI

Total Credits: 2
Total Instructions Hours: 48 h

S.No	Contents
1	Program to apply functions to explore a dataset
2	i) Program to implement string functions ii) Program to create user defined functions
3	Program to implement vectors, matrices and list
4	Program using parent-child structure i) read data from a .CSV file ii) write data into a .JSON file
5	Program to represent vector values in the form of bar-plot, scatter plot and contour plot
6	Program to implement the operations of loading, reading and merging in data frames
7	Program to implement descriptive statistics methods
8	Program to implement linear regression model for a dataset
9	Program to implement logistic regression model for a dataset
10	Program to explore data visualization commands
11	Program to implement linear filtering using the filter() command
12	Program to decompose seasonal and non-seasonal time series data

References

1. Seema Acharya, 2018, "Data Analytics using R", First Edition, McGraw Hill Education.
2. Hadley Wickham, Garrett Grolemund, 2017, "R for Data Science: Import, Tidy, Transform, Visualize, and Model Data Paperback", O'Reilly Publishers.
3. Robert L. Kabacoff, 2015, "R in Action", Second Edition, Dreamtech Press Publisher.

Course Code	Course Name	Category	L	T	P	Credit
224CT1A6DA	ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING TECHNIQUES	DSE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- the fundamentals of Artificial Intelligence and problem-solving methods
- different types of machine learning techniques
- Neural Network concepts and applications of AI

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 AI	K2
CO2	Interpret appropriate search algorithms for problem solving	K2
CO3	Understand the categories of machine learning and the steps involved in data scrubbing process	K2
CO4	Interpret decision trees and regression models for solving problems	K2
CO5	Apply Neural Networks for AI 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

224CT1A6DA	ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING TECHNIQUES	SEMESTER VI

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Artificial Intelligence 10 h

Artificial Intelligence: Introduction - History - Intelligent Agents: Agents and Environments - Nature of Environments. Structure of Agents: Agent Programs - Simple Reflex Agent - Model Based Reflex Agent - Goal Based Agents - Utility Based Agents - Learning Agents.

Unit II Problem Solving 10 h

Problem Solving Agents – Toy Problem – Real World Problems. Searching Strategies: Breadth First Search - Depth First Search (DFS) - Depth Limited Search - Iterative Deepening DFS - Greedy Best First Search - A* Search.

Unit III Machine Learning 10 h

Machine Learning (ML): Introduction – Categories: Supervised Learning, Unsupervised Learning, Reinforcement Learning. ML Toolbox: Data - Infrastructure - Algorithms - Data Scrubbing: Feature Selection - Row Compression - One-Hot Encoding - Binning - Missing data - Setting the data.

Unit IV Algorithmic Learning 8 h

Learning Decision Trees - Evaluating and choosing the best hypothesis - Univariate linear regression - Multivariate linear regression - Support Vector Machines - Ensemble learning - Case study.

Unit V Neural Networks and Applications of AI 10 h

Artificial Neural Networks: Neural Network Structures - Single layer feed forward neural networks - Multilayer feed forward neural networks - Learning in multilayer networks. Applications of AI: Business Intelligence - Healthcare - Education - Finance - Manufacturing.
Case Study: Large Language Models

Text Books

1 Stuart Russell and Peter Norvig, 2021, "Artificial Intelligence – A Modern Approach", Fourth Edition, Pearson Education.

2 Oliver Theobald, 2017, "Machine Learning for Absolute Beginners", Second Edition.

References

1 John D. Kelleher, Brian Mac Namee, Aoife D'Arcy, "Fundamentals of Machine Learning for Predictive Data Analytics", Second Edition, MIT Press.

2 Kevin Night, Elaine Rich, Nair B., 2008, "Artificial Intelligence", Tata McGraw Hill.

3 Patrick H. Winston, 2006, "Artificial Intelligence", Third Edition, Pearson Education.

4 Deepak Khemani, 2013, "Artificial Intelligence", Tata McGraw Hill Education.

Course Code	Course Name	Category	L	T	P	Credit
224CT1A6DB	CLOUD COMPUTING AND VIRTUALIZATION	DSE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- fundamentals, benefits and limitations of Cloud Computing
- Cloud Computing Architecture and Services
- Virtualization, Data Storage and Security in Cloud

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Acquire knowledge on Cloud Computing terminologies.	K2
CO2	Understand the architecture of Cloud	K2
CO3	Infer Cloud Computing services and deployment models	K2
CO4	Understand virtualization techniques in Cloud	K2
CO5	Apply security measures in cloud	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

224CT1A6DB	CLOUD COMPUTING AND VIRTUALIZATION	SEMESTER VI

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Cloud Computing 8 h

Introduction - Applications - Intranets and Cloud - Cloud Service Providers - Benefits - Limitations - Security Concerns - Regulatory Issues. Hardware and infrastructure: Clients, Network - Cloud Platforms - Web APIs.

Unit II Cloud Architecture 10 h

Cloud Architecture - Front End - Back End - Components of Cloud Computing Architecture - Working of Cloud Computing - Applications of Cloud Computing. Scalability and Redundancy: Key features of Scalability - Types of Scalability - Benefits of Scalability - Concepts and benefits of Redundancy.

Unit III Cloud Services 10 h

Introduction - Benefits - Types of Cloud Service Models: Software as a Service - Platform as a Service - Infrastructure as a Service - Network as a Service. Cloud Deployment Models: Public Cloud - Private Cloud - Community Cloud - Hybrid Cloud.

Unit IV Virtualization 10 h

Definition - Features - Benefits - Difference between Cloud Computing and Virtualization - Types of Virtualization: Hardware Virtualization - Software Virtualization - Server Virtualization - Storage Virtualization.

Unit V Data Storage and Security 10 h

Cloud Storage basics - Types of Cloud Storage - Advantages and Risks of Cloud Storage - Infrastructure - Data Protection Process - Cloud Security - Measures and Controls in Cloud Security. Cloud Operation and Challenges: Defining Cloud Operations - Management - Benefits - Challenges - Mobile Cloud Computing and Applications.

Case Study: Mobile Applications with IoT and Cloud.

Text Books

1 Anthony T.Velte, Toby T.Velte, Robert Elsenpeter, 2020, "Cloud Computing: A Practical Approach", Twenty Eighth Reprint, McGraw Hill Education.

2 Surbhi Rastogi, 2021, "Cloud Computing Simplified", First Edition, BPB Publications.

References

1 Kamal Kant Hiran, Ruchi Doshi, Temitayo Fagbola, Mehul Mahrishi, 2023, "Cloud Computing", First Edition, BPB Publications.

2 Arshdeep Bahga, Vijay Madisetti, 2019, "Cloud Computing: A Hands-on Approach", Universities Press (India) Private Limited.

3 Douglas Comer , 2021," The Cloud Computing Book-The Future of Computing Explained", First Edition, CRC Press, Taylor and Francis Group.

Course Code	Course Name	Category	L	T	P	Credit
224CT1A6DC	FUNDAMENTALS OF INTERNET OF THINGS	DSE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- fundamental concepts of IoT and domain specific IoTs
- IoT platform design methodology and Physical devices
- security design in IoT

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the fundamental concepts of IoT.	K2
CO2	Infer the knowledge on Domain specific IoTs.	K2
CO3	Identify IoT platform design specifications for developing applications.	K2
CO4	Illustrate applications using Arduino and Raspberry PI.	K3
CO5	Discover the risks and security design in IoT	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

224CT1A6DC	FUNDAMENTALS OF INTERNET OF THINGS	SEMESTER VI

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Introduction 9 h

Internet of Things (IoT): Introduction - Physical Design - Logical Design of IoT: Functional Blocks - Communication Models - Communication APIs. IoT Enabling Technologies: Wireless Sensor Networks - Cloud Computing - Big Data Analytics - IoT Levels and Deployment.

Unit II Domain Specific IoTs 10 h

Introduction - Home Automation - Cities - Environment - Energy - Retail - Logistics - Agriculture - Industry - Health and Lifestyle. IoT and Machine to Machine (M2M): Introduction - M2M - Difference between IoT and M2M - Software Defined Networking (SDN) for IoT - Network Function Virtualization (NFV) for IoT.

Unit III IoT Platforms Design Specifications 10 h

IoT Design Specifications: Purpose and Requirements Specification - Process Specification - Domain Model Specification - Information Model Specification - Service Specification - IoT Level Specification - Functional View Specification - Operational View Specification - Device and Component Integration - Application Development - Case Study.

Unit IV IoT Physical Devices 9 h

Building Blocks of IoT device - Arduino: Board description - Installation - Program Structure - Blinking LED with Arduino - Humidity Sensor with Arduino. Raspberry PI: Board description, Raspberry PI interfaces - Interfacing an LED and switch with Raspberry PI - Interfacing a light sensor with Raspberry PI.

Unit V IoT Security 10 h

Threats - Vulnerability - Risks - Attacks - Safety and Security design - Security Products and Services - Secure IoT System Implementation Lifecycle: Implementation and Integration - Operations and Maintenance - Dispose.

Text Books

1. Vijay Madisetti and Arshdeep Bahga, 2015, "Internet of Things - A Hands-on Approach", First Edition, VPT
2. Russell, Brian and Drew Van Duren, 2016, "Practical Internet of Things Security ", Second Edition, Packt Publishing

References

1. Rajkamal, 2017, "Internet of Things: Architecture, Design Principles and Applications", McGraw Hill Higher Education
2. Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, 2014, "From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence", First Edition, Academic Press.
3. David Hanes, Gonzalo Salgueiro, Patrick Grossetete, Rob Barton and Jerome Henry, 2017, "IoT Fundamentals: Networking Technologies, Protocols and Use Cases for Internet of Things", Cisco Press
4. https://onlinecourses.nptel.ac.in/noc19_cs65

Course Code	Course Name	Category	L	T	P	Credit
224CT1A6DD	BIG DATA TOOLS AND TECHNOLOGIES	DSE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- fundamental concepts of Big Data
- tools used for Big Data processing
- open source NoSQL databases

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand fundamentals of Big Data Technologies	K2
CO2	Interpret Hadoop Framework and MapReduce in Big Data Processing	K2
CO3	Acquire knowledge on Hive and Pig to process the Big Data	K2
CO4	Build database using NoSQL to handle Big Data	K3
CO5	Apply MongoDB in Big Data 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

224CT1A6DD	BIG DATA TOOLS AND TECHNOLOGIES	SEMESTER VI

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Big Data 8 h

Introduction - Classification of Data - Big Data Characteristics and Types - Scalability and Parallel Processing - Data Architecture Design - Data Source - Data Pre-Processing and Storing - Big Data storage - Big Data platform - Big Data analytics.

Unit II Hadoop and MapReduce 10 h

Hadoop Overview - Hadoop Distributed File System (HDFS) - Processing data with Hadoop - Hadoop Yet Another Resource Navigator (YARN) - Hadoop Ecosystem - MapReduce: Mapper - Reducer - Combiner - Partitioner - Searching - Sorting.

Unit III Hive and Pig 12 h

Hive: Introduction - Architecture - Data Types - File Formats - Hive Query Language (HQL) - User Defined Functions. Pig: Introduction - Pig on Hadoop - Pig Latin: Statements, Keywords, Identifiers - Data Types - Running Pig - Execution Modes - Relational Operators.

Unit IV NoSQL 8 h

Introduction - NoSQL Data Store - NoSQL Data Architecture Patterns: Key-Value Store - Document Store - Tabular Data - Object Data Store - Graph Database - Managing Big Data – Shared Nothing Architecture.

Unit V MongoDB 10 h

Introduction - JSON - Unique Key Generation - Dynamic Queries - Storing Binary Data - Replication - Sharding - Updation - Create, Drop Database - Data Types. MongoDB Query Language: Insert, Save, Update, Remove, Find - Case Study.

Text Books

1 Raj Kamal and Preeti Saxena, 2018, "Big Data Analytics: Introduction to Hadoop, Spark and Machine-Learning", First Edition, McGraw Hill Education.

2 Seema Acharya, Subhashini Chellappan, 2019, "Big Data and Analytics", Second Edition, Wiley.

References

1 Tom White, 2012, "Hadoop: The Definitive Guide", Third Edition, O'Reily Media.

2 Douglas Eadline, 2016, "Hadoop 2 Quick-Start Guide: Learn the Essentials of Big Data Computing in the Apache Hadoop 2 Ecosystem", First Edition, Pearson Education.

3 Mayank Bhushan, 2018, "Big Data and Hadoop Learn by Example", Second Edition, BPB Publications.

Course Code	Course Name	Category	L	T	P	Credit
224CT1A6DE	FAULT TOLERANT SYSTEMS	DSE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- fault tolerance in computing systems
- classifications of faults and delve into different redundancy techniques
- software fault tolerance techniques to handle real-world challenges

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand and classify different types of faults in computing systems	K2
CO2	Differentiate various Information Redundancy techniques and their applications	K2
CO3	Apply redundancy techniques to design and implement Fault Tolerant networks	K3
CO4	Identify, assess the dependability and performance metrics of Software Fault Tolerance	K3
CO5	Develop knowledge of Software Reliability Models and Checkpointing	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

224CT1A6DE	FAULT TOLERANT SYSTEMS	SEMESTER VI

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Fault Tolerance 10 h

Introduction - Fault Classification - Types of Redundancy - Measures of Fault Tolerance. Hardware Fault Tolerance: The Rate of Hardware Failures - Failure Rate, Reliability and Mean Time to Failure. Canonical and Resilient Structures: Series and Parallel Systems, Non-Series and Parallel Systems - Reliability Evaluation Techniques - Fault Tolerance Processor Level Techniques - Byzantine Failures.

Unit II Information Redundancy 8 h

Coding: Parity Codes, Checksum, M-of-N codes. RAID Level 1 - RAID level 2 - RAID level 3 - RAID level 4 - RAID level 5 - Non-Hierarchical Data Replication - Hierarchical Data Replication.

Unit III Fault Tolerant Networks 10 h

Measures of Resilience: Graph-Theoretical Measures - Computer Network Measures. Network Topologies and Resilience: Multi-Stage and Extra-Stage Networks - Crossbar Networks - Mesh Networks - Hypercube Networks - Loop Networks. Fault Tolerant Routing: Hypercube Fault Tolerant Routing - Origin Based Routing.

Unit IV Software Fault Tolerance 10 h

Software Fault Tolerance: Acceptance Tests - Single-Version Fault Tolerance Wrappers - Software Rejuvenation. N-Version Programming: Consistent Comparison Problem, Version Independence. Recovery Block Approach: Basic Principles, Success Probability Calculation, Distributed Recovery Blocks.

Unit V Software Reliability Models 10 h

Software Reliability Models: Jelinski–Moranda Model - Littlewood–Verrall Model - Fault-Tolerant Remote Procedure Call. Checkpointing: Checkpoint Level – Domino Effect and Livelock - Time Based Synchronization - Message Logging.

Text Books

1 Israel Koren, C. Mani Krishna, 2020, "Fault-Tolerant Systems", Second Edition, Morgan Kaufmann

References

1 E. Dubrova, 2013, "Fault-Tolerant Design", Springer.

2 Kjetil Norvag, 2000, "An Introduction to Fault Tolerant Systems", IDI Technical Report

3 Michael R. Lyu, 1995, "Software Fault Tolerance", John Wiley & Sons Ltd

4 D. K. Pradhan, 1998, "Fault-Tolerant Computing, Theory and Techniques", Prentice-Hall

Course Code	Course Name	Category	L	T	P	Credit
224CT1A6DF	EDGE COMPUTING	DSE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- the essentials of Edge Computing and the design patterns.
- Edge Native applications and data confidentiality in Edge environments.
- Edge Computing use cases.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Acquire knowledge on the fundamentals of Edge Computing and the Networking concepts.	K2
CO2	Understand Edge Computing design patterns with respect to Cloud.	K2
CO3	Identify the usage of Kubernetes and the steps to create Edge Native applications.	K3
CO4	Make use of Encryption techniques to provide Data Security in Edge environments.	K3
CO5	Analyze real-time data for diverse Edge Computing use cases.	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

224CT1A6DF	EDGE COMPUTING	SEMESTER VI

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Edge Computing 8 h

Edge Computing: Definition - Characteristics - Scenarios - Edge Computing Architecture - Networking for Edge Computing - Edge Devices - Fleet Management. Edge Computing Interfaces: Middleware - Application Interfaces.

Unit II Design Patterns 10 h

Edge to Cloud: Data Collection Patterns - Messaging, Ingress endpoints - Remoting Patterns - Compute Offloading Patterns. Cloud to Edge: Edge Acceleration Patterns - Edge Functions Patterns - Cloud Compute Stack on Edge. Edge Native Compute Stack: Datacenters - Template based Compute Stack - Multi-access Edge Computing Framework.

Unit III Native Applications 10 h

Kubernetes on Edge: Kubernetes Cluster - Federation Topologies - Securing Kubernetes Cluster. Edge Native Applications: Autonomous Bootstrapping - Adaptive to Environmental changes - Edge High Availability - End-to-End Security - Manageability - One Stack Multiple Perspective (OSMP) Model.

Unit IV Data Storage Security 10 h

Data Security - Data Encryption methods: Identity based, Attribute based, Proxy Re-Encryption, Function based, Honey based, Search based and Homomorphic Encryption. Authentication - Privacy-Preserving Schemes - Edge-based Attack Detection and Prevention.

Unit V Analytics 10 h

Edge Analytics: Data Analytics - Types of Data Analytics - Edge Data Analytics - Architecture of Edge Analytics - Machine Learning for Edge Devices. Edge Computing Use Cases: Autonomous Vehicles - Smart Cities - Industrial Automation - Network Functions - Healthcare.

Case Study: Blood Pressure Monitor to Predict Hypotension in Edge Server - Detect Body Heat Index in Edge Server.

Text Books

1 Haisai Bai, Boris Scholl, 2021, "Edge Computing and Capability Oriented Architecture", First Edition, CRC Press.

2 K.Anitha Kumari, G.Sudha Sadasivam, D.Dharani, M. Niranjanamurthy, 2022, "Edge Computing - Fundamentals, Advances and Applications", First Edition, CRC Press.

References

1 Rajkumar Buyya, Satish Narayana Srirama, 2019, "Fog and Edge Computing: Principles and Paradigms", Wiley Publication.

2 Perry Lea, 2020, "IoT and Edge Computing for Architects", Second Edition, Packt Publishing.

3 David Jensen, 2019, "Beginning Azure IoT Edge Computing: Extending the Cloud to the Intelligent Edge", First Edition, Springer.

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 (IP) 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

BoS Chairman/HoD
Department of Computer Technology
Dr. N. G. P. Arts and Science College
Coimbatore – 641 048

Dr.N.G.P. Arts and Science College
APPROVED
BoS- 18th 08/11/24 | AC - 18th 26/11/24 | GB -

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

Dr.NGPASC
COIMBATORE | INDIA