

**Dr. N.G.P.ARTS AND SCIENCE COLLEGE (Autonomous)**

**REGULATIONS 2020-21 for Under Graduate Programme  
(Outcome Based Education model with Choice Based Credit System)**

**Bachelor of Science in Computer Science with Cognitive Systems**

(For the students admitted during the academic year 2020-21 and onwards)

**Programme: B.Sc. Computer Science with Cognitive Systems**

**Eligibility**

Candidates for admission to the first year of the **Bachelor of Science (Computer Science with Cognitive Systems)** 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 anyone of the following subjects: Mathematics / Computer Science 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. To offer a sufficient core understanding about Computer Science and Cognitive based applications to the students.
2. Graduates will be engaged in a wide range of careers and/or graduate studies in computer science or related fields with a passion for lifelong learning.
3. Students able to complete successfully be able to computer program on their own. Sufficient programming skills will require the use of best practices.
4. To understand of professional, ethical, legal, security, and social issues and responsibilities of the computing profession.
5. Understand how technological advances impact society and the social, legal, ethical and cultural ramifications of computer technology and their usage.



**PROGRAMME OUTCOMES:**

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

<b>PO Number</b>	<b>PO Statement</b>
<b>PO1</b>	The graduates are relied upon to apply mathematical foundations, algorithmic standards and software engineering hypothesis in displaying, plan and direct of trials just as information interpretation and analysis.
<b>PO2</b>	Dissect an unpredictable computing issue and to apply principles of computing and other significant disciplines to recognize solutions.
<b>PO3</b>	Graduates will create solid thinking aptitudes to empower them to take effective choices in key administration and promoting positions and get presented to bleeding edge improvements in computing technology innovations.
<b>PO4</b>	Creating and executing solution based frameworks or potentially forms that address issues and additionally improve existing frameworks inside in a computing based industry.
<b>PO5</b>	Implementation of cognitive-skill based solutions for the betterment of society keeping the environmental context in mind, be aware of professional ethics and be able to communicate effectively.



**Guidelines for Programmes offering Part I& Part II for Four Semesters:**

Part	Subjects	No.of Papers	Credit	Semester No.
<b>I</b>	Tamil / Hindi / French/Malayalam	4	4 x 3 = 12	I to IV
<b>II</b>	English	4	4 x 3 = 12	I to IV
<b>III</b>	Core (Credits 2,3,4 )	20	60	I to VI
	Inter Departmental Course (IDC)	4	16	I to IV
	Discipline Specific Elective (DSE)	3	3 x 4 = 12	V & VI
	Skill Enhancement Course(SEC)	4	10	III & IV
	Generic Elective(GE)	2	2 x 2 = 4	III & IV
	Lab on Project (LoP)	1	1	III to V
<b>IV</b>	Environmental Studies(AECC)	1	2	I
	Value Education (VE) (Human Rights, Women's Rights) (AECC)	2	4	II and III
	General Awareness(On-Line Exam) (AECC)	1	2	IV
	RM ( AECC)	1	2	V
	Innovation, IPR, Entrepreneurship (AECC)	1	2	VI
<b>V</b>	Extension Activity NSS / Sports / Department Activity	-	1	I to VI
<b>TOTALCREDITS</b>			<b>140</b>	



## CURRICULUM

B.Sc. COMPUTER SCIENCE WITH COGNITIVE SYSTEMS  
PROGRAMME

Course Code	Course Category	Course Name	L	T	P	Exam (hours)	Max Marks			Credits	
							CIA	ESE	Total		
First Semester											
Part - I											
191TL1A1TA	Language - I	Tamil-I	4	1	-	3	25	75	100	3	
201TL1A1HA		Hindi-I									
201TL1A1MA		Malayalam-I									
201TL1A1FA		French – I									
Part - II											
191EL1A1EA	Language - II	English – I	4	-	1	3	25	75	100	3	
Part - III											
204CG1A1CA	Core - I	Problem Solving Techniques	4	1	-	3	25	75	100	4	
202MT1A1IB	IDC - I	Discrete Mathematical Structure	4	1	-	3	25	75	100	4	
204CG1A1CP	Core Practical - I	Programming in C	-	-	4	3	40	60	100	2	
204CG1A1CQ	Core Practical - II	Introduction to Worksheets	-	-	4	3	40	60	100	2	
Part - IV											
193MB1A1AA	AECC - I	Environmental Studies	2	-	-	3	-	50	50	2	
Total			18	3	9				650	20	



Bos Chairman / HoD  
Dept. of Computer Science with Cognitive Systems  
Dr. N. G. P. Arts and Science College  
Coimbatore - 641 048



Dr.NGPASC

COIMBATORE | INDIA

B.Sc. Computer Science with Cognitive Systems (Students admitted during the AY 2020-21)



Course Code	Course Category	Course Name	L	T	P	Exam (hours)	Max Marks			Credits
							CIA	ESE	Total	
Second Semester										
Part - I										
191TL1A2TA	Language - I	Tamil-II	4	1	0	3	25	75	100	3
201TL1A2HA		Hindi-II								
201TL1A2MA		Malayalam-II								
201TL1A2FA		French - II								
Part - II										
191EL1A2EA	Language - II	English - II	4	0	1	3	25	75	100	3
Part - III										
204CG1A2CA	Core - II	Operating Systems	4	1	0	3	25	75	100	4
204CG1A2CB	Core - III	Data Structures and Algorithms	4	1	0	3	25	75	100	4
204CG1A2CP	Core Practical - III	Operating Systems	0	0	4	3	40	60	100	2
202PY1A2IE	IDC - II	Digital Computer Fundamentals	4	0	0	3	25	75	100	4
Part - IV										
196BM1A2AA	AECC - II	Human Rights	2	0	0	3	-	50	50	2
Total			22	3	5				650	22



Course Code	Course Category	Course Name	L	T	P	Exam (hours)	Max Marks			Credits
							CIA	ESE	Total	
Third Semester										
Part - I										
191TL1A3TA	Language - I	Tamil-III	3	1	0	3	25	75	100	3
191TL1A3HA		Hindi-III								
191TL1A3MA		Malayalam-III								
191TL1A3FA		French - III								
Part - II										
191EL1A3EA	Language - II	English - III	4	0	0	3	25	75	100	3
Part - III										
204CG1A3CA	Core - IV	Computer Networks	3	0	0	3	25	75	100	3
204CG1A3CP	Core Practical - IV	Computer Networks	0	0	4	3	40	60	100	2
202MT1A3IE	IDC - III	Optimization Techniques	4	0	0	3	25	75	100	4
204CG1A3SA	SEC - I	Programming in Python	3	0	0	3	25	75	100	3
204CG1A3SP	SEC Practical - I	Python Programming	0	0	4	3	40	60	100	2
	GE - I		2	0	0	3	-	50	50	2
	LoP	Lab on Project	-	-	-	-	-	-	-	-
Part - IV										
191TL1A3AA	AECC - III	Basic Tamil	2	0	0	3	-	50	50	2
191TL1A3AB		Advanced Tamil								
195CR1A3AA		Women's Rights								
Total			21	1	8				800	24



Course Code	Course Category	Course Name	L	T	P	Exam (hours)	Max Marks			Credits
							CIA	ESE	Total	
Fourth Semester										
Part - I										
191TL1A4TA	Language - I	Tamil-IV	3	1	0	3	25	75	100	3
191TL1A4HA		Hindi-IV								
191TL1A4MA		Malayalam-IV								
201TL1A4FA		French – IV								
Part – II										
191EL1A4EA	Language - II	English – IV	4	0	0	3	25	75	100	3
Part – III										
204CG1A4CA	Core - V	Relational Database Management Systems	3	0	0	3	25	75	100	3
204CG1A4CP	Core Practical- V	PL/SQL	0	0	4	3	40	60	100	2
205CI1A4IA	IDC - IV	Digital Marketing	4	0	0	3	25	75	100	4
204CG1A4SA	SEC - II	Cloud and Virtualization	3	0	0	3	25	75	100	3
204CG1A4SP	SEC Practical- II	Advanced Cloud	0	0	4	3	40	60	100	2
	GE - II		2	0	0	3	-	50	50	2
	LoP	Lab on Project	-	-	-	-	-	-	-	-
Part - IV										
191TL1A4AA	AECC - IV	Basic Tamil	2	0	0	3	-	50	50	2
191TL1A4AB		Advanced Tamil								
192PY1A4AA		General Awareness								
Total			21	1	8				800	24



Course Code	Course Category	Course Name	L	T	P	Exam (hours)	Max Marks			Credits
							CIA	ESE	Total	
Fifth Semester										
Part - III										
204CG1A5CA	Core - VI	Introduction to Digital Technologies	4	1	0	3	25	75	100	4
204CG1A5CB	Core - VII	Process Management	4	0	0	3	25	75	100	3
204CG1A5CC	Core - VIII	Software Testing	4	0	0	3	25	75	100	4
204CG1A5CD	Core - IX	Information Technology Infrastructure Library	3	0	0	3	25	75	100	3
204CG1A5CP	Core Practical - VI	Digital Technologies	0	0	4	3	25	75	100	2
204CG1A5CQ	Core Practical - VII	Software Testing	0	0	4	3	25	75	100	2
204CG1A5DA	DSE – I	Design Thinking	4	0	0	3	25	75	100	4
204CG1A5DB		Internet Programming								
204CG1A5DC		Cyber Security								
204CG1A5TA	IT	Industrial Training	Grade A to C							
204CG1A5LA	LoP	Lab on Project	-	-	-	-	50	-	50	1
Part - IV										
192MT1A5AA	AECC -V	Research Methodology	2	0	0	3	-	50	50	2
Total			21	1	8				800	25



Course Code	Course Category	Course Name	L	T	P	Exam (hours)	Max Marks			Credits
							CIA	ESE	Total	
Sixth Semester										
Part - III										
204CG1A6CA	Core - X	Client Relationship Management	4	0	0	3	25	75	100	4
204CG1A6CB	Core - XI	Data Mining and Warehousing	4	0	0	3	25	75	100	4
204CG1A6CP	Core Practical - VIII	Client Relationship Management	0	0	4	3	40	60	100	2
204CG1A6CV	Core – IX - Project	Project Work	0	0	8	-	40	60	100	4
204CG1A6DA	DSE – II	Wireless Networks	4	0	0	3	25	75	100	4
204CG1A6DB		Software Design with UML								
204CG1A6DC		Mobile Computing								
204CG1A6DD	DSE – III	Artificial Intelligence	4	0	0	3	25	75	100	4
204CG1A6DE		Devops Application								
204CG1A6DF		Network Security								
Part - IV										
193BC1A6AA	AECC - VI	Innovation, IPR and Entrepreneurship	2	0	0	3	-	50	50	2
Part - V										
204CG1A6XA		Extension Activity	-	-	-	-	50	-	50	1
Total			18	0	12				700	25
Grand Total									4400	140





## 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.	204CG1A5DA	Design Thinking
2.	204CG1A5DB	Internet Programming
3.	204CG1A5DC	Cyber Security

### Semester VI (Elective II)

#### List of Elective Courses

S. No.	Course Code	Name of the Course
1.	204CG1A6DA	Wireless Networks
2.	204CG1A6DB	Software Design with UML
3.	204CG1A6DC	Mobile Computing

### Semester VI (Elective III)

#### List of Elective Courses

S. No.	Course Code	Name of the Course
1.	204CG1A6DD	Artificial Intelligence
2.	204CG1A6DE	Devops Application
3.	204CG1A6DF	Network Security



### GENERIC ELECTIVE COURSES (GE)

The following are the courses offered under Generic Elective Course

#### Semester III (GE-I)

S. No.	Course Code	Course Name
1	204CG1A3GA	Computing and Internet Technology

#### Semester IV (GE-II)

S. No.	Course Code	Course Name
1	204CG1A4GA	E-Commerce Technologies

### EXTRA CREDIT COURSES

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

S. No.	Course Code	Course Name
1	204CG1ASSA	Cognitive Skills for IT
2	204CG1ASSB	Web Technology

### CERTIFICATE PROGRAMMES

The following are the programme offered to earn extra credits:

S. No.	Course Code	Course Name
1	4CG5A	Software Testing
2	4CG5B	Advanced Cloud Services



## MOOC (NPTEL/SWAYAM/ SPOKEN TUTORIAL)

The following are the online courses offered:

Please refer the following link to select the courses

- [www.swayam.org](http://www.swayam.org)
- [www.nptel.ac.in](http://www.nptel.ac.in)
- [www.spoken-tutorial.org](http://www.spoken-tutorial.org)



## REGULATION 2019-20

Effective from the academic year 2019-20 and applicable to the students admitted to the Degree of Bachelor of Science / Commerce/ Arts.

### 1. NOMENCLATURE

1.1 Faculty: Refers to a group of programmes concerned with a major division of knowledge are. Eg. Faculty of Computer Science consists of disciplines like Departments of Computer Science, Information Technology, Computer Technology and Computer Applications.

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 2015–2018 refers to students belonging to a 3 year Degree programme admitted in 2015 and completing in 2018.

1.4 Course Refers to a component (a paper) 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 and learning needs and the credits may be assigned suitably.

#### a) Core Courses

A course, which should compulsorily be studied by a candidate as a core requirement is termed as a Core course.

#### 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: DSE courses are the courses offered by the respective disciplinary/ interdisciplinary programme.

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

#### e) Ability Enhancement Courses (AEC): AEC courses are the courses based upon the content that leads to Knowledge enhancement. These



are mandatory for all disciplines. Environmental Science, Human Rights, Women's Rights, General Awareness, IPR and Innovation, Entrepreneurship Development and Research Methodology.

All these courses should be taught according to Outcome based Education.

### 1.5 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.

### 1.6 Projectwork

It is considered as a special 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.

### Extra credits

Extra credits will be awarded to a student for achievements in co-curricular activities carried out outside the regular class hours. The guidelines for the award of extra credits are given in section- these credits are not mandatory for completing the programme.

### Advanced Learner Course (ALC):

ALC is doing work of a higher standard than usual for students at that stage in their education. Research work carried out in University/ Research Institutions/ Industries of repute in India or abroad for a period of 15 to 30 days will be considered as Advanced LearnersCourse.





## 2. STRUCTURE OF PROGRAMME

### 2.1 PART - I: LANGUAGE

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

### 2.2 PART - II : ENGLISH

English will be offered during the first two / four semester.

### 2.3 PART - III:

- Core course
- Inter Departmental Course (IDC)
- Discipline Specific Elective (DSE)
- Skill Enhancement Course (SEC)
- Generic Elective (GE)
- Lab on Project (LoP)
- Industrial Training (IT)

### 2.4 PART IV

#### 2.4.1 Ability Enhancement Compulsory Course

The ability enhancement courses such as i) Environmental Studies, ii) Human Rights, iii) Women's Rights, iv) General Awareness, v) Research Methodology, vi) Intellectual Property Rights (IPR), Innovation and Entrepreneurship or IPR and Innovation from I to VI Semester.

a) Those who have not studied Tamil up to XII Std and taken a non-Tamil language under Part-I shall take Tamil comprising of two courses.

(OR)

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

(OR)

c) Students who come under the above a+b categories are exempted from Women's Rights and General awareness during III and IV semester respectively.



## 2.5 PART V: EXTENSION ACTIVITIES

The following co-curricular and extracurricular activities are offered under institutional / department Association/ club/ extension programmes for the students under extension activities from I to IV semester.

### a) Institutional

- National Service Scheme(NSS)  
Participation in any one of the camps organized by NSS unit.
- Friends of Police(FoP)  
Active participation in traffic regulation and other extension activities
- Sports  
Active participation in any one of the sports activities
- Youth Red Cross (YRC)  
Active participation in YRC programmes

### b) Department Association

Membership and active participation in the department association activities.

### c) Clubs

Membership and active participation in any one club activities.

## 1. CREDIT ALLOTMENT

The following is the credit allotment:

- Lecture Hours(Theory) : Max.1 credit per lecture hour per week,  
1 credit per tutorial 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

## 2. DURATION OF THE PROGRAMME

A student is normally expected to complete the B.Sc. /B.com. /BA Programme in 6 semesters. However, in any case not more than 7 consecutive semesters. Failing which the concern BoS will identify suitable / equivalent course.



### 3. REQUIREMENTS FOR COMPLETION OF ASEMESTER

Candidate shall be permitted to appear for the End Semester examinations for any semester (practical/theory) if

- i) He/she secures not less than 75% of attendance in the number of working days during the semester.
- ii) He/she earns a progress certificate from the Head of the institution, of having satisfactorily completed the course of study prescribed in the scheme of examinations for that semester as required by these regulations, and
- iii) His/her conduct / character is satisfactory.
  - Provided that it shall be open to the Academic council, or any authority delegated with such powers by the Academic council, to grant exemption to a candidate who has failed to earn 75% of the attendance prescribed, for valid reasons, subject to usual conditions. (Refer the Ordinance No.1 of 1990 of the Bharathiar University)
  - A candidate who earned 75% of attendance and more in the current semester are eligible to write the examination in current semester subjects.
  - A candidate who has secured less than 65% but 55% and above attendance in any semester has to compensate the shortage in attendance in the subsequent semester besides earning the required percentage of attendance in that semester and appear for both semester papers together at the end of the later semester.
  - A candidate who has secured less than 55% of attendance in any semester shall not be permitted to appear for the regular examinations and to continue the study in the subsequent semester. He/she has to rejoin the semester in which the attendance is less than 55%.
  - A candidate who has secured less than 65% of attendance in the final semester has to compensate his/her attendance shortage in a manner as decided by the concerned Head of the department after rejoining the same course.



#### 4. 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 (including the project work and Viva-Voce examination in the final Semester) shall be 100 with the following breakup.

##### (i) Theory Courses

Continuous Internal Assessment (CIA) : 25 Marks

End Semester Exams (ESE) : 75 Marks

##### (ii) For Practical/Courses

Continuous Internal Assessment (CIA) : 40 Marks

End Semester Exams (ESE) : 60 Marks

- a. The following are the distribution of marks for the Continuous Internal Assessment in Practical, Project / Industrial Training Courses.

Continuous Internal Assessment for Practical Courses:

S.No	For - UG practical courses	Distribution of Marks					
1	Minimum 10 experiments to be conducted/practical paper/semester	20	15	10	8	5	4
2	Tests : Two tests out of which one shall be during the mid semester and the other to be conducted as model test at the end of the semester.)	16	10	10	8	6	6
3	Observation Note Book	4	5	5	4	4	-
	TOTAL MARKS	40	30	25	20	15	10



### Project viva-voce / Industrial Training

The following are the distribution of marks for the continuous Internal assessment in UG Project/Industrial Training courses.

S.no	For - UG Project courses//Industrial Training	Distribution of Marks	
1	Review-I	5	10
2	Review-II	5	10
3	Review-III	5	10
4	Document, Preparation and Implementation	10	10
	TOTAL MARKS	25	40

b. Following are the distribution of marks for the External Examination in UG Project /Industrial Training courses

S.no	For - UG Project //Industrial Training courses	Distribution of Marks	
1	Record Work and Presentation	35	40
2	Viva-Voce	15	20
	TOTAL MARKS	50	60

### Part – IV

The courses offered under Part – IV shall have only End Semester Examinations (ESE) for a maximum of 50 Marks. However, Students who select “Tamil” under Part IV, will be assessed only by Continuous Internal Assessment (CIA). The marks shall be furnished to the COE by the concerned Course teacher through the Head of the Department.





## 6.1 CONTINUOUS ASSESSMENT EXAMS

### 6.1 Theory courses

#### a) Continuous Internal Assessment test(CIA)

There will be a Minimum of two Continuous Assessment Exams, for each Theory course. The first and Second Assessment Exams will be conducted for a Maximum of 50 Marks and 75 marks respectively. The total marks secured in the Two Assessment Exams will be converted to 15 Marks.

#### b) Utilization of Library

Marks will be awarded to the student based on the hours spent in the library after the working hours and submission of report by the student.

Hours spent in Library	Marks	Type of Document submitted
2	1	Report/ Assignment/Class presentation
4	2	
6	3	
8	4	
10	5	
12	6	

- During the Library hour, the student must spend time in reading the articles, books, journals of their subject of interest
- Each student should borrow minimum three books during the semester
- Student is expected to submit one Report / Assignment / Class Presentation per Course.

#### c) Class Participation

Active participation in classroom discussion by the student will be evaluated based on Integration of knowledge, Interaction and Participation and demonstration of knowledge.



d) Papers / Reports/ Assignments/ ClassPresentation

The student will be evaluated based on his ability to do analysis of application of theory to real world problems or creative extension of class room learning and his/her ability to communicate the given topic effectively and clearly.

**Continuous Assessment OBE Rubrics Score Sheet**

Degree: \_\_\_\_\_ Branch: \_\_\_\_\_ Semester: \_\_\_\_\_

CourseCode: \_\_\_\_\_ Course: \_\_\_\_\_

Max. Marks: \_\_\_\_\_ Internal: \_\_\_\_\_ External: \_\_\_\_\_ Total: \_\_\_\_\_

S.No.	REG. NO	THEORY / PRACTICAL & LIBRARY CLASS PARTICIPATION (15) (Compulsory)				RUBRICS ASSESSMENT (SELECT ANY ONE)									Total Marks out of : 30	Total Marks out of : 16 / 10 / 08 / 04
						PAPERS / REPORTS (15)			ASSIGNMENTS (15)			CLASS PRESENTATION (15)				
		Library	Integration of Knowledge	Interaction & Participation	Demonstration of Knowledge	Organization & Knowledge	Format & Spelling	Reference / Experiments	Demonstration of Knowledge	Format & Spelling	Reference	Content & Coherence	Creativity and Speaking Skills	Duration of Presentation		
1		6	3	3	3	5	5	5	5	5	5	5	5	5		



The following are the distribution of marks for the continuous internal assessment in UG practical courses

S.No	For - UG Practical Courses	Distribution of Marks					
1	Minimum 10 experiments to be conducted/practical paper/semester	20	15	10	8	5	4
2	Tests : Two tests out of which one shall be during the mid semester and the other to be conducted as model test at the end of the semester.)	16	10	10	8	6	6
3	Observation Note Book	4	5	5	4	4	-
	TOTAL MARKS	40	30	25	20	15	10



## 7. FOR PROGRAMME COMPLETION

Programme Completion (for students admitted in the A.Y.2019-20 and Onwards)

Student has to complete the following:

- i) Part I, II, III, IV, V as mentioned in the scheme
- ii) Industrial/ Institutional training

Students must undertake industrial / institutional training for a minimum of 15 days and not exceeding 30 days during the IV semester summer vacation. The students will submit the report for evaluation during V semester.

Based on the performance Grade will be awarded as follows:

Marks Scored	Grade to be awarded
75 and above	A
60-74	B
40-59	C
< 40	Re-Appearence

- iii) Skill Enhancement Training

Student must undergo Skill Enhancement training on Communication skills (I and II Semester) and Quantitative aptitude (III and IV Semester) respectively each for 40 h.



## 8. EXTRACREDITS

- Earning extra credit is mandatory. However, it is not essential for programme completion
- Extra Credits will be awarded to a student for achievement in co-curricular/ extracurricular activities carried other than the regular class-hours.
- The detailed guidelines for the award of extra credits are as follows:
- A student is permitted to earn a maximum of five extra Credits during the programme duration of UG from I to V Semester.
- Candidate can claim a maximum of 1 credit under each category listed.

The following are the guidelines for the award of Extra credits:

### 8.1 Proficiency in foreign language

Qualification	Credit
A pass in any foreign language in the examination conducted by an authorized agency	1

### 8.2 Proficiency in Hindi

Qualification	Credit
A pass in the Hindi examination conducted by Dakshin Bharat Hindi Prachar Sabha	1

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

### 8.3 Self-study Course

Qualification	Credit
A pass in the self-study courses offered by the department	1

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





#### 8.4 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.

Qualification	Credit
A pass in the type writing / short hand examination offered by TNDTE	1

#### 8.5 Diploma /Certificate

Courses offered by any recognized University / NCVRT

Qualification	Credit
A pass in any Certificate course/ Diploma / PG Diploma	1

#### 8.6 CA/ICSI/CMA

Qualification	Credit
Qualifying foundation / Inter level / Final in CA/ICSI/CMA / etc.,	1

#### 8.7 Sports andGames

The Student can earn extra credit based on their Achievement in sports as given below:

Qualification	Credits
Achievement in University/ State / National/ International	1

#### 8.8 OnlineCourses

Pass in any one of the online courses

Qualification	Credit
SWAYAM/NPTEL/Spoken Tutorial etc.,	1



## 8.9 Publications / Conference Presentations(Oral/Poster)/ Awards

Qualification	Credit
Research Publications in Journals/oral/poster presentation in Conference	1

## 8.10 Innovation / Incubation / Patent / Sponsored Projects / Consultancy

Qualification	Credit
Development of model/ Products /Prototype /Process/App/Registration of Patents/ Copyrights/Trademarks/Sponsored Projects /Consultancy	1

## 8.11 Representation

Qualification	Credit
State / National level celebrations such as Independence day, Republic day Parade, National Integration campetc.,	1



Course Code	Course Name	Category	L	T	P	Credit
191TLIA1TA	தமிழ்த் தாள் - I	மொழி- I	4	1	-	3

### PREAMBLE

This course has been designed for students to learn and understand

- மொழிப்பாடங்களின் வாயிலாக தமிழரின் பண்பாடு , 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) – மாணவனின் செயலாக்கத்திறனை ஊக்குவித்தல்	K1,K2,K3
CO2	மதிப்புக்கல்வி (Attitude and Value education)	K2,K4
CO3	பாட இணைச் செயல்பாடுகள் (Co-curricular activities)	K2,K3,K4
CO4	சூழலியல் ஆக்கம் (Ecology)	K4
CO5	மொழி அறிவு (Tamil knowledge)	K5, K6

### MAPPING WITH PROGRAMME OUTCOMES

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

**S Strong**

**M Medium**

**L Low**



Dr.NGPASC

COIMBATORE | INDIA

B.Sc. Computer Science with Cognitive Systems (Students admitted during the AY 2020-21)

191TLIA1TA	தமிழ்த்தாள் - I	SEMESTER I
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Total Credits: 03

Total Instruction Hours: 60 h

### Syllabus

**Unit I** மறுமலர்ச்சிக் கவிதைகள் 12 h

1. உயிர் பெற்ற தமிழர் பாட்டு - பாரதியார்
2. படி - பாரதிதாசன்
3. போராடப் புறப்பட்டோம் - தமிழ் ஒளி
4. தமிழ்க் கொலை புரியாதீர் - புலவர் குழந்தை
5. திரைத்தமிழ்
  - அ) சும்மா கிடந்த நிலத்தை எனத்தொடங்கும் பாடல் -
  - பட்டுக்கோட்டை கல்யாண சுந்தரனார்
  - ஆ) சமரசம் உலாவும் இடமும் எனத்தொடங்கும் பாடல் - மருதகாசி
  - இ) உன்னை அறிந்தால் எனத்தொடங்கும் பாடல் - கண்ணதாசன்

**Unit II** புதுக்கவிதைகள் 12 h

1. கடமையைச் செய் - மீரா
2. அம்மாவின் பொய்கள் - ஞானக்கூத்தன்
3. செருப்புடன் ஒரு பேட்டி - மு.மேத்தா
4. ஒரு சிங்கவால் குரங்கின் மரணம் - சிற்பி
5. கடல்கோள் 2004 - முத்தமிழ் விரும்பி
6. கரிக்கிறது தாய்ப்பால் - ஆரூர் தமிழ்நாடன்
7. பள்ளி - நா. முத்துக்குமார்
8. ஹைகூ கவிதைகள் - 15 கவிதைகள்

**Unit III** பெண்ணியம் 08 h

1. ஒரு கதவும் கொஞ்சம் கள்ளிப்பாலும் - தாமரை
2. நீரில் அலையும் முகம் - அ. வெண்ணிலா
3. தொட்டிச் செடி - இளம்பிறை
4. ஏனிந்த வித்தியாசங்கள் - மல்லிகா



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## Unit IV சிறுகதைகள்

15 h

- |                        |                    |
|------------------------|--------------------|
| 1. வேப்பமரம்           | - ந. பிச்சமூர்த்தி |
| 2. அகல்யை              | - புதுமைப்பித்தன்  |
| 3. ஒருபிடி சோறு        | - ஜெயகாந்தன்       |
| 4. காய்ச்சமரம்         | - கி. ராஜநாராயணன்  |
| 5. நிராசை              | - பாமா             |
| 6. எருமை சீமாட்டி      | - பெருமாள் முருகன் |
| 7. குதிரை மசால் தாத்தா | - சு. வேணுகோபால்   |

## Unit V இலக்கியவரலாறு, இலக்கணம் மற்றும் பயிற்சிப் பகுதி

13 h

### அ. இலக்கிய வரலாறு

1. மறுமலர்ச்சிக் கவிஞர்களின் தமிழ்ப்பணிகள்
2. புதுக்கவிதையின் தோற்றமும் வளர்ச்சியும்
3. சிறுகதையின் தோற்றமும் வளர்ச்சியும்

### ஆ. இலக்கணம்

1. வல்லினம் மிகும், மிகா இடங்கள் (ஒற்றுப்பிழை நீக்கி எழுதுதல்)
2. ர,ற ,ல, ழ, ள ,ண, ந,ன, வேறுபாடு (ஒலிப்பு நெறி, சொற்பொருள் வேறுபாடு அறிதல்)

### இ. படைப்பாக்கப் பயிற்சி

1. கவிதை, சிறுகதை எழுதுதல்

## Text Books

- 1 செய்யுள் மற்றும் உரைநடைத் திரட்டு . 2019. தொகுப்பு : தமிழ்த் துறை , டாக்டர் என். ஜி.பி. கலை மற்றும் அறிவியல் கல்லூரி. நியூ செஞ்சுரி புக் ஹவுஸ்(பி)லிட். சென்னை.

## References

- 1 பேராசிரியர் முனைவர் பாக்கியமேரி. இலக்கணம் இலக்கிய வரலாறு மொழித்திறன். முதல் பதிப்பு 2013 . பூவேந்தன் பதிப்பகம். சென்னை
- 2 தமிழண்ணல் . புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு . பதினாறாம் பதிப்பு 2000 மீனாட்சி புத்தக நிலையம். மதுரை.
- 3 பேராசிரியர் புலவர் இளவரசு ,சோம. புதிய நோக்கில் தமிழ் இலக்கிய வரலாறு. எட்டாம் பதிப்பு ஜூலை 2012.மணிவாசகர் பதிப்பகம்.சென்னை
- 4 தமிழ் இணையக் கல்விக்கழகம். <<http://www.tamilvu.org/>>



Course Code	Course Name	Category	L	T	P	Credit
201TL1A1HA	HINDI-I	Language 1	4	1	-	03

## PREAMBLE

This course has been designed for students to learn and understand

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

communicate Hindi

## 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	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

**S Strong**

**M Medium**

**L Low**



201TL1A1HA	HINDI-I	SEMESTER I
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Total Credits: 03

Total Instruction Hours: 60 h

### Syllabus

<b>Unit I</b>	गद्य – नूतन गद्य संग्रह (जय प्रकाश)	12 h
	पाठ 1- रजिया	
	पाठ 2- मक्रील	
	पाठ 3- बहता पानी निर्मला	
	पाठ 4- राष्ट्रपिता महात्मा गाँधी	
<b>Unit II</b>	कहानी कुंज- डॉ वी.पी. 'अमिताभ'	12 h
	कहानी कुंज- डॉ वी.पी. 'अमिताभ' (पाठ 1-4)	
<b>Unit III</b>	व्याकरण	12 h
	शब्द विचार ( संज्ञा, सर्वनाम, कारक, विशेषण)	
<b>Unit IV</b>	अनुच्छेद लेखन	12 h
	अनुच्छेद लेखन	
<b>Unit V</b>	अनुवाद	12 h
	अभ्यास-III (केवल अंग्रेजी से हिन्दी में)	

### Text Books

- 1 प्रकाशक: सुमित्र प्रकाशन 204 लीला अपार्टमेंट्स, 15 हेस्टिंग्स रोड' अशोक नगर  
इलाहाबाद-211001 (Unit - I)
- 2 प्रकाशक: गोविन्द प्रकाशन सदर बाजार, मथुरा उत्तर प्रदेश – 281001 (Unit-II)
- 3 पुस्तक: व्याकरण प्रदिप – रामदेव प्रकाशक: हिन्दी भवन 36 टेगोर नगर इलाहाबाद –  
211024 (Unit-III)
- 4 पुस्तक: व्याकरण प्रदिप – रामदेव प्रकाशक: हिन्दी भवन 36 इलाहाबाद-211024 (Unit-IV)
- 5 (पाठ 1 to 10) प्रकाशक: दक्षिण भारत प्रचार सभा चेन्नई -17 (Unit - V)



Course Code	Course Name	Category	L	T	P	Credit
201TL1A1MA	MALAYALAM	Language - I	4	1	-	3

### PREAMBLE

This course has been designed for students to learn and understand

- develop the writing ability and develop reading skill.
- various concepts and techniques for criticizing literature, to learn 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	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

**S Strong**

**M Medium**

**L Low**





201TL1A1MA	MALAYALAM - I	SEMESTER I
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**Total Credits: 3**

**Total Instruction Hours: 60 h**

### Syllabus

<b>Unit I</b>	Novel	12 h
	1. Alahayude penmakkal	
<b>Unit II</b>	Novel	12 h
	1. Alahayude penmakkal	
<b>Unit III</b>	Short Story	14 h
	2. Nalinakanthi	
<b>Unit IV</b>	Short Story	10 h
	2. Nalinakanthi	
<b>Unit V</b>		12 h
	Composition & Translation	

### Text Books

- 1 Alahayude penmakkal (NOVEL) By Sara Joseph Published by Current books Thrissur.
- 2 Nalinakanthi (Short story) By T.Padmanabhan Published by DC.Books Kottayam
- 3 Expansion of ideas, General Essay And Translation.

### References

- 1 Malayala Novel Sahithyam
- 2 Malayala cherukatha Innale Innu.



Course Code	Course Name	Category	L	T	P	Credit
201TL1A1FA	FRENCH- I	Language - I	4	1	-	3

## PREAMBLE

This course has been designed for students to learn and understand

- 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.
- 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	learn the adjectives and the classroom environment in France.	K2
CO3	Learn the Plural, Articles and the Hobbies.	K3
CO4	learn the Cultural Activity in France.	K3
CO5	learn 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	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

**S Strong**

**M Medium**

**L Low**



201TL1A1FA	FRENCH- I	SEMESTER I
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Total Credits: 3

Total Instruction Hours: 60 h

### Syllabus

#### Unit I Salut I Page 10

12 h

Objectifs de Communication	Tâche	Activités de réception et de production orale
<ul style="list-style-type: none"> <li>• Saluer</li> <li>• Enter en contact avec quelqu'un.</li> <li>• Se presenter.</li> <li>• S'excuser</li> </ul>	En cours de cuisine, premiers contacts avec les membres d'un groupe	<ul style="list-style-type: none"> <li>• Comprendre des personnes qui se saluent.</li> <li>• Échanger pour entrer en contact, se présenter, saluer, s'excuser.</li> <li>• Communiquer avec <i>tu</i> ou <i>vous</i>.</li> <li>• Comprendre les consignes de classe</li> <li>• Épeler son nom et son prénom.</li> </ul> <p>Computer jusqu'à 10.</p>

#### Unit II Enchanté I Page 20

12 h

Objectifs de Communication	Tâche	Activités de réception et de production orale
<ul style="list-style-type: none"> <li>• Demander de se presenter.</li> <li>• Présenter quelqu'un.</li> </ul>	Dans la classe de français, se presenter et remplir une fiche pour le professeur.	<ul style="list-style-type: none"> <li>• Comprendre les informations essentielles dans un échange en milieu professionnel.</li> <li>• Échanger pour se presenter et présenter quelqu'un.</li> </ul>

#### Unit III J'adore I Page 30

12 h

Objectifs de Communication	Tâche	Activités de réception et de production orale
<ul style="list-style-type: none"> <li>• Exprimer ses goûts.</li> </ul>	Dans un café, participer à une soirée de rencontres	<ul style="list-style-type: none"> <li>• Dans une soirée de rencontres rapid comprendre des personnes qui échantent sur elles et sur leurs goût</li> <li>• Comprendre une personne</li> </ul>



	rapides et remplir de tâches d'appréciation.	qui parler des goûts de quelqu'un d'autre.
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**Unit IV J'adore I Page 30**

14 h

<b>Objectifs de Communication</b>	<b>Tâche</b>	<b>Activités de réception et de production orale</b>
<ul style="list-style-type: none"> <li>• Présenter quelqu'un</li> </ul>	<p>Dans un café, participer à une soirée de rencontres rapides et remplir de tâches d'appréciation</p>	<ul style="list-style-type: none"> <li>• Exprimer ses goûts.</li> <li>• Comprendre une demande laissée sur un répondeur téléphonique.</li> <li>• Parler de ses projets de week-end.</li> </ul>
Autoévaluation du module I Page 40 – Préparation au DELF A1 page 42		

**Unit V Tu veux bien? Page 46**

10 h

<b>Objectifs de Communication</b>	<b>Tâche</b>	<b>Activités de réception et de production orale</b>
<ul style="list-style-type: none"> <li>• Demander à quelqu'un de faire quelque chose.</li> <li>• Demander poliment.</li> <li>• Parler d'actions passées.</li> </ul>	<p>Organiser un programme d'activités pour accueillir une personne importante.</p>	<ul style="list-style-type: none"> <li>• Comprendre une personne demande un service à quelqu'un.</li> <li>• Demander à quelqu'un de faire quelque chose.</li> <li>• Imaginer et raconter au passé à partir de situations dessinées.</li> </ul>

**Text Books**

- 1 Regine Merieux, Yves Loiseau, LATITUDES 1(Methode de Français), Goyal Publisher & Distributors Pvt.Ltd., 86 UB Jawahar Nagar (Kamala Nagar),Delhi-7 Les Editions Dider, Paris,2008- Imprime en Roumanie par Canale en Janvier 2012.



Course Code	Course Name	Category	L	T	P	Credit
191EL1A1EA	ENGLISH - I	Language - II	4	0	1	3

## PREAMBLE

This course has been designed for students to learn and understand

- To experience the effect of dialogue, the brilliance of imagery and the magnificence of varied genre
- To strengthen the student's English vocabulary and understanding of English sentence structure
- To communicate effectively and acquire knowledge on 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	Extend interest in and appreciation of the works of eminent writers from various literatures	K2
CO2	Interpret the genres in literature through the master works of great visionaries	K3
CO3	Perceive the language gaps through a clear model of the grammatical structure	K5
CO4	Analyze the concepts of texts in the course of different lessons which are realistic and discursive in nature	K4
CO5	Value the integral concepts of English grammar necessarily required in their linguistic competence	K5

## MAPPING WITH PROGRAMME OUTCOMES

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

**S Strong**

**M Medium**

**L Low**



Dr.NGPASC

COIMBATORE | INDIA

B.Sc. Computer Science with Cognitive Systems (Students admitted during the AY 2020-21)

<b>191EL1A1EA</b>	<b>ENGLISH - I</b>	<b>SEMESTER I</b>
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**Total Credits: 3**

**Total Instruction Hours: 60 h**

### **Syllabus**

**Unit I**      Genre Studies - I 10 h

The Road Not Taken – Robert Frost

All the World's a Stage – William Shakespeare

Whitewashing the Fence – Mark Twain

The Face of Judas Iscariot - Bonnie Chamberlain

Soul Gone Home – Langston Hughes

**Unit II**      Genre Studies - II 11 h

Ode on a Grecian Urn – John Keats

Mending Wall – Robert Frost

My Early Days – Dr. A.P.J. Abdul Kalam

Nightfall – Isaac Asimov

A Kind of Justice – Margret Atwood

**Unit III**      Grammar - I 14 h

Parts of Speech

Articles and Prepositions

Subject Verb Agreement

Degrees of Comparison

Sequence of Tenses

**Unit IV**      Genre Studies - III 11 h

On his Blindness - John Milton

Small - Scale Reflections on a Great House – A.K. Ramanujan

On Prayer – Khalil Gibran

The Garden Party – Katherine Mansfield

The Tell - Tale Heart – Edgar Allen Poe



**Unit V** Grammar - II

14 h

If Conditionals

Modal Auxiliary Verbs

Question Types/Tags

Voice

Direct and Indirect Speech

**Text Books**

- 1 Prabha, Vithya. R and S. Nithya Devi. 2019. Sparkle: English Textbook for First Year. McGraw Hill Education, Chennai.
- 2 Wren and Martin. 2006. High School English Grammar and Composition. S. Chand Publishing, New Delhi.

**References**

- 1 Bajwa and Kaushik. 2010. Springboard to Success- Workbook for Developing English and Employability Skills. Orient Black Swan, Chennai
- 2 Syamala. V. 2002. Effective English Communication for You. Emerald Publishers, Chennai.
- 3 Krishnaswamy. N, Lalitha Krishnaswamy & B.S. Valke. 2015. Eco English, Learning English through Environment Issues. An Integrated, Interactive Anthology. Bloomsbury Publications, New Delhi.
- 4 Krishnaswamy. N. 2000. Modern English: A Book of Grammar, Usage And Composition. Macmillan, New Delhi.



Course Code	Course Name	Category	L	T	P	Credit
204CG1A1CA	PROBLEM SOLVING TECHNIQUES	CORE-I	4	1	-	4

## PREAMBLE

This course has been designed for students to learn and understand

- To cause the student to get familiar with a C programming language.
- To learn problem solving techniques.
- To teach the student to compose programs in C and to take care of the problems.

## COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Read, comprehend and follow the execution of projects written in C language.	K1
CO2	Write the C Source Code for a given calculation.	K2
CO3	Implement Programs with pointers and arrays, perform pointer arithmetic, and utilize the pre-processor.	K3
CO4	Develop the programs that perform operations utilizing derived data types.	K3
CO5	Identify tasks in which the numerical procedures learned are relevant and apply them to compose programs	K3

## MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	M	S	S	M	M
CO2	S	S	S	M	L
CO3	S	S	M	S	S
CO4	M	S	S	S	L
CO5	S	M	M	M	S

**S Strong**

**M Medium**

**L Low**





<b>204CG1A1CA</b>	<b>PROBLEM SOLVING TECHNIQUES</b>	<b>SEMESTER I</b>
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**Total Credits: 4**

**Total Instruction Hours: 60 h**

### **Syllabus**

#### **Unit I      Introduction to Problem Solving      12 h**

Introduction - Logical Thinking-Flow charts - Implementation of Algorithm - Concepts with a Programming Language - Importance of C - Basic structure of C programs. Constants, variables and data types: Character set - C Tokens - Keywords and identifiers - Constants - Variables - Declaration of storage classes - Assigning values to variables Defining symbolic constants. Operators and expressions - Evaluation of expressions - Precedence of arithmetic operators - Type conversions in expressions - Operator precedence and associativity.

#### **Unit II      Decision making and branching      12 h**

Simple IF, IF-ELSE, Nesting of IF-ELSE, ELSE-IF ladder, Switch statements - GOTO statements. Decision making and looping: WHILE statement - DO statement - FOR statement - Jumps in loops. Arrays: Definition & Declaration - One dimensional - Two dimensional - Multi dimensional arrays.

#### **Unit III      Character arrays and strings      12 h**

Introduction - Declaring and initializing string variables - Reading strings from terminal - Writing strings to screen - String handling functions. User Defined functions: Introduction - Needs & Elements of User Defined function -Definition - Return values and their types - Function calls - Function declaration - Category of functions - Nesting of functions - Recursion - Passing arrays and Strings to functions - The scope, lifetime & Visibility of Variables.

#### **Unit IV      Structures and Unions      12 h**

Introduction - Defining a structure - Declaring structure variables - Accessing structure members - Structure initialization - Arrays of structures - Arrays within structures - Structures within structures - Structures and functions - Unions - Bit fields. Pointers: Introduction - Understanding pointers - Accessing the address of a variable - Initializing of pointer variables. Pointers and arrays - Pointers and character strings - Pointers as function arguments.



**Unit V**      File Management

12 h

Introduction - Defining and opening a file -Closing a file - Input / Output operation on files - Error handling during I/O operations - Random access files - Command line arguments.

**Text Books**

- 1      Balagurusamy . E , 2017, "Programming in ANSI C",7th Edition,  
Tata McGraw Hill Publication.

**References**

- 1      Herbert Schildt , 2000,"C: The Complete Reference", 4th Edition ,  
Tata McGraw Hill Publication.
- 2      Juneja B.L.,Anita Seth, 2000, "Programming in C", 1st Edition, Cengage  
Learning India Publication.



Course Code	Course Name	Category	L	T	P	Credit
202MT1A1IB	DISCRETE MATHEMATICAL STRUCTURE	IDC	4	1	-	4

### PREAMBLE

This course has been designed for students to learn and understand

- set theory operation and assist in planning.
- basic concept of relation and function.
- apply the concept of graph theory and algebraic structures in various fields

### COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	explain the concept of set theory	K1
CO2	apply the concept of Logical operators	K3
CO3	demonstrate the concept and know the difference between Relation and Function	K2
CO4	analyze the concept of Algebraic Structures and Graph theory	K2
CO5	expose the concept of Language and Finite State Machine	K1

### MAPPING WITH PROGRAMME OUTCOMES

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

**S Strong**

**M Medium**

**L Low**



<b>202MT1A1IB</b>	<b>DISCRETE MATHEMATICAL STRUCTURE</b>	<b>SEMESTER I</b>
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**Total Credits: 4**

**Total Instruction Hours: 60 h**

### **Syllabus**

**Unit I**      Set Theory 12 h

Introduction- Set and its elements - Set Description - Types of Sets - Venn-Euler Diagrams - Set Operations and Laws of Set Theory - Fundamental Products - Partitions of sets-Minsets - Algebra of sets and Duality - Inclusion and Exclusion Principle

**Unit II**      Mathematical Logic 12 h

Introduction- Propositional Calculus - Basic Logical Operations - Statements Generated by a Set - Conditional Statements -Converse, Inverse and Contrapositive Statements - Biconditional statements - Tautologies - Contradiction - Contingency

**Unit III**      Relations and Functions 12 h

Relations - Cartesian Product of Sets -Binary Relations - Set Operation on Relations-Types of Relations - Partial Order Relation - Equivalence Relation

Functions - Definition and Notation of a function - Types of Functions - Invertible Functions.

**Unit IV**      Algebraic Structures and Graph Theory 12 h

Algebraic Structures - Mathematical Operations - Binary Operations - Groups - Modulo

Graph Theory - Basic Terminology - Path, Cycles and Connectivity - Subgraphs - Types of Graphs - Isomorphic Graphs - Homeomorphic Graphs -Representation of Graphs in Computer Memory-Eulerian and Hamiltonian graphs

**Unit V**      Language , Grammar and Automata 12 h

Introduction - Set Theory of Strings - Languages - Regular Expressions and Regular Languages - Grammar - Finite State Machine - Finite State Automata

**Note:** Theory 20% and Problem 80%



## Text Books

- 1 Sharma J.K, 2014, ' Discrete Mathematics' , Second Edition, Macmillan India Ltd, Chennai

## References

- 1 Tremblay J.P and Manohar.R , ' Discrete Mathematics Structures with Applications to computer science' , Second Edition , Mc Graw Hill International, New York
- 2 Dr Venketaramen M.K , Dr Sridharan .N , Chandarasekaran. N, 2000, 'Discrete Mathematics', second edition , The National publishing Company, Chennai
- 3 Dr Uma Shanker Gupta, ' Discrete Mathematics Structures' , first edition , Pearson publication, Delhi
- 4 Dr Babu Ram, ' Discrete Mathematics ' , second edition , Delhi Pearson publication, Delhi



204CG1A1CP	PROGRAMMING IN C	SEMESTER - I
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**Total Credits: 2**

**Total Instructions Hours: 48h**

S.No	List of Experiments
1	Programs using I/O statements and expressions.
2	Programs using decision-making constructs.
3	Write a program to find whether the given year is leap year or not.
4	Design a calculator to perform the operations, namely, addition, subtraction, multiplication, division and square of a number.
5	Check whether a given number is Armstrong number or not.
6	Convert the given decimal number into binary, octal and hexadecimal numbers using user defined functions.
	From a given paragraph perform the following using built-in functions:
7	a. Find the total number of words.
	b. Capitalize the first word of each sentence.
	c. Replace a given word with another word.
8	Solve towers of Hanoi using recursion.
9	Sort the list of numbers using pass by reference.
10	Generate salary slip of employees using structures and pointers.
11	Compute internal marks of students for five different subjects using structures and functions.
12	Write a program to create structure called traveler and members of structure are train no, coach no, seat no, source ,destination , gender, age, name and departure date.

**Note:** Out of 12 - 10 Mandatory



204CG1A1CQ	INTRODUCTION TO WORKSHEETS	SEMESTER - I
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**Total Credits: 2**

**Total Instructions Hours: 48h**

S.No	List of Experiments
1	Grade Sheet Exercise: Illustrates how to create a basic spreadsheet by entering text, numbers, and formulas.
2	Checkbook Exercise: Introduces formatting of cells and columns.
3	Mortgage Exercise: See how functions can be used to create a spreadsheet to perform "what if?" calculations.
4	Using ChartWizard: Demonstrates the ease of creating charts.
5	Sorting Exercise: Learn how to sort data and print portions of a worksheet.
6	Special Formats and Exporting Exercise: Illustrates how to dress up a table using special formats and how to export a table or chart into a Microsoft Word document.
7	Cost-Benefit Analysis Exercise: Demonstrates a basic cost-benefit analysis using Excel.
8	Linking Exercise: Learn how to consolidate several worksheets into one and to link several worksheets to a master worksheet.
9	Regression Exercise: Illustrates the use of analysis tools for conducting bivariate regression and forecasting.
10	Statistical Analysis Exercise: Use a worksheet to calculate descriptive statistics (e.g., mean, standard deviation, skewness, kurtosis, frequency distribution, correlation).
11	Bivariate Regression Exercise: Estimate a bivariate regression equation and related summary statistics.
12	Plan your posts in advance using a social media content calendar template. Includes a Gantt-like timeline as well as a monthly calendar view.

**Note:** Out of 12 - 10 Mandatory



Course Code	Course Name	Category	L	T	P	Credit
193MB1A1AA	VALUE EDUCATION- 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	inculcate the knowledge on structure, function and energy flow in the Eco system.	K3
CO3	impart knowledge on Biodiversity and its conservation.	K3
CO4	create awareness on effects, causes and control of air, water, soil and noise pollution etc.	K2,K3
CO5	build awareness about sustainable development and Environmental protection	K2,K3

### MAPPING WITH PROGRAMME OUTCOMES

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

**S Strong**

**M Medium**

**L Low**





<b>193MB1A1AA</b>	<b>VALUE EDUCATION- ENVIRONMENTAL STUDIES</b>	<b>SEMESTER I</b>
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**Total Credits: 2**

**Total Instruction Hours: 24 h**

### **Syllabus**

#### **Unit I      Introduction to Environmental studies& Ecosystems      4 h**

Multidisciplinary nature of environmental studies; components of environment – atmosphere, hydrosphere, lithosphere and biosphere. Scope and importance; Concept of sustainability and sustainable development. What is an ecosystem? Structure and function of ecosystem; Energy flow in an ecosystem: food chain, food web and ecological succession. Case studies of the following ecosystems: Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries).

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

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). Heating of earth and circulation of air; air mass formation and precipitation. Energy resources: Renewable and non-renewable energy sources, use of alternate energy sources, growing energy needs, case studies.

#### **Unit III      Biodiversity and Conservation      5 h**

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. Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.

#### **Unit IV      Environmental Pollution, Environmental Policies & Practices      5 h**

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; Air (Prevention & Control of Pollution) Act; Water (Prevention and control of Pollution) Act; Wildlife Protection Act; Forest Conservation Act; International agreements; Montreal and Kyoto protocols and conservation on Biological Diversity (CBD). The Chemical Weapons Convention (CWC). Nature reserves, tribal population and rights, and human, wildlife conflicts in Indian context.

**Unit V**      Human Communities and the Environment& Field Work      5 h

Human population and growth: Impacts on environment, human health and welfares. Carbon foot-print. Resettlement and rehabilitation of project affected persons; case studies. Disaster management: floods, earthquakes, cyclones and landslides. Environmental movements: Chipko, Silent valley, Bishnios of Rajasthan. Environmental ethics: Role of Indian and other religions and cultures in environmental conservation. Environmental communication and public awareness, case studies (e.g., CNG vehicles in Delhi). Visit to an area to document environmental assets; river/forest/flora/fauna, etc. Visit to a local polluted site – Urban/Rural/Industrial/Agricultural. Study of common plants, insects, birds and basic principles of identification. Study of simple ecosystems-pond, river, Delhi Ridge, etc.

**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.
- 3 Gleeson, B. and Low, N. (eds.) 1999. Global Ethics and Environment, London, Routledge.
- 4 Gleick, P.H. 1993. Water in Crisis. Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute, Oxford Univ. Press.
- 5 Groom, Martha J. Gary K. Meffe, and Carl Ronald carroll. Principles of Conservation Biology. Sunderland: Sinauer Associates, 2006.
- 6 Grumbine, R. Edward, and Pandit, M.K. 2013. Threats from India's Himalaya dams. Science, 339: 36-37.
- 7 McCully, P. 1996. Rivers no more: the environmental effects of dams (pp. 2964). Zed Books.
- 8 McNeil, John R. 2000. Something New Under the Sun: An Environmental History of the Twentieth Century.
- 9 Odum, E.P., Odum, h.T. & Andrews, J. 1971. Fundamentals of Ecology. Philadelphia: Saunders.

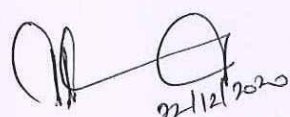


## References

- 1 Pepper, I.L., Gerba, C.P. & Brusseau, M.L. 2011. Environmental and Pollution Science. Academic Press.
- 2 Rao, M.N. & Datta, A.K. 1987. Waste Water Treatment. Oxford and IBH Publishing Co. Pvt. Ltd.
- 3 Raven, P.H., Hassenzahl, D.M. & Berg, L.R. 2012. Environment. 8th edition. John Wiley & Sons.
- 4 Rosencranz, A., Divan, S., & Noble, M.L. 2001. Environmental law and policy in India. Tripathi 1992.



Course Code	Course Category	Course Name	L	T	P	Exam (hours)	Max Marks			Credits	
							CIA	ESE	Total		
Second Semester											
Part - I											
191TL1A2TA	Language - I	Tamil-II	4	1	0	3	25	75	100	3	
201TL1A2HA		Hindi-II									
201TL1A2MA		Malayalam-II									
201TL1A2FA		French – II									
Part – II											
201EL1A2EA	Language - II	English – II	4	0	1	3	25	75	100	3	
Part – III											
204CG1A2CA	Core - II	Operating Systems	4	1	0	3	25	75	100	4	
204CG1A2CB	Core - III	Data Structures and Algorithms	4	1	0	3	25	75	100	4	
204CG1A2CP	Core Practical - III	Operating Systems	0	0	4	3	40	60	100	2	
202PY1A2IE	IDC - II	Digital Computer Fundamentals	4	0	0	3	25	75	100	4	
Part - IV											
196BM1A2AA	AECC - II	Human Rights	2	0	0	3	-	50	50	2	
Total			22	3	5				650	22	

  
22/12/2020

**Bos Chairman / HoD**  
Dept. of Computer Science with Cognitive Systems  
Dr. N. G. P. Arts and Science College  
Coimbatore - 641 048



Dr. NGPASC

COIMBATORE | INDIA

B.Sc. Computer Science with Cognitive Systems (Students admitted during the AY 2020-21)

Course Code	Course Name	Category	L	T	P	Credit
191TLIA2TA	பகுதி-1: தமிழ் - தாள்- II	மொழி	4	1	-	3

### PREAMBLE

This course has been designed for students to learn and understand

- மொழிப் பாடங்களின் வாயிலாகத் தமிழரின் பண்பாடு, பகுத்தறிவு ஆகியவற்றை அறியச் செய்தல்
- கலை மற்றும் மரபுகளை அறியச் செய்தல்
- மாணவர்களின் படைப்பாக்கத் திறன்களை 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) – மாணவனின் செயலாக்கத்திறனை ஊக்குவித்தல்	K1,K2,K3
CO2	மதிப்புக்கல்வி (Attitude and Value education)	K2,K4
CO3	பாட இணைச் செயல்பாடுகள் (Co-curricular activities)	K2,K3,K4
CO4	சூழலியல் ஆக்கம் (Ecology)	K4
CO5	மொழி அறிவு (Tamil knowledge)	K5

### MAPPING WITH PROGRAMME OUTCOMES

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

**S Strong**

**M Medium**

**L Low**



Dr. NGPASC

COIMBATORE | INDIA

B.Sc. Computer Science with Cognitive Systems (Students admitted during the AY 2020-21)

191TLIA2TA	பகுதி-1: தமிழ் - தாள்- II	SEMESTER II
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Total Credits: 3  
Total Instruction Hours: 60 h

### Syllabus

**Unit I அற இலக்கியம்** 12 h

1. திருக்குறள்

அ.அறன் வலியுறுத்தல் (அ. எண்: 04)

ஆ.நட்பாராய்தல் (அ. எண்: 80)

இ.சான்றாண்மை (அ. எண்: 99)

ஈ.குறிப்பறிதல் (அ. எண்: 110)

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

**Unit II அற இலக்கியம்** 10 h

1. நாலடியார் - அறிவுடைமை

2.பழமொழி நானூறு - வீட்டு நெறி

3. கார்நாற்பது - தோழி பருவங்காட்டி தலைமகளை வற்புறுத்திய பாடல்கள்  
(1முதல் - 18பாடல்கள் )

**Unit III உரைநடை** 10 h

1. பெற்றோர்ப் பேணல் - திரு.வி.க.

2. உள்ளம் குளிர்ந்தது - மு.வரதராசனார்

3. சங்கநெறிகள் - வ.சுப.மாணிக்கம்

**Unit IV உரைநடை** 13 h

1.பெரியார் உணர்த்தும்

சுயமரியாதையும் சமதர்மமும் - வே. ஆனைமுத்து

2. வீரவணக்கம் - கைலாசபதி

3.மொழியும்நிலமும் - எஸ். ராமகிருஷ்ணன்





அ.இலக்கிய வரலாறு

1. பதினெண் கீழ்க்கணக்கு நூல்கள்
2. தமிழ் உரைநடையின் தோற்றமும் வளர்ச்சியும்

ஆ. இலக்கணம்

1. வழு, வழுவமைதி, வழாநிலை

இ. பயிற்சிப் பகுதி

1. நூல் மதிப்பீடு மற்றும் திரைக்கதை திறனாய்வு
2. தன்விவரக் குறிப்பு எழுதுதல்

**Note :** பயிற்சிப் பகுதியில் வினாக்கள் அமைத்தல் கூடாது

### Text Books

- தொகுப்பு: தமிழ்த்துறை, டாக்டர் என்.ஜி.பி. கலை அறிவியல் கல்லூரி (தன்னாட்சி)
- 1 செய்யுள் மற்றும் உரைநடைத் திரட்டு. (முதல்பதிப்பு.) சென்னை: நியூ செஞ்சுரி பக்ஹவுஸ் (பி) லிட்.

### References

- 1 பேராசிரியர் புலவர் இளவரசு, சோம. (ஜூலை2012). தமிழ் இலக்கிய வரலாறு. (எட்டாம் பதிப்பு) சென்னை: மணிவாசகர் பதிப்பகம்.
- 2 பேராசிரியர் முனைவர் பாக்கியமேரி (2013). இலக்கணம் இலக்கிய வரலாறு மொழித்திறன். (முதல் பதிப்பு) சென்னை பூவேந்தன் பதிப்பகம்.
- 3 தமிழ் இணையக் கல்விக்கழகம் <<http://www.tamilvu.org/>>



Course Code	Course Name	Category	L	T	P	Credit
201TL1A2HA	HINDI -II	LANGUAGE	4	1	-	3

### PREAMBLE

This course has been designed for students to learn and understand

- To develop the writing ability and develop reading skill.
- To learn various concepts and techniques for criticizing literature, to learn 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	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

**S Strong**

**M Medium**

**L Low**





201TL1A2HA	HINDI -II	SEMESTER II
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**Total Credits:** 03

**Total Instruction Hours:** 60 h

## Syllabus

### Unit I 12 h

आधुनिक पद्य – शबरी (श्री नरेश मेहता)

प्रकाशक: लोकभारती प्रकाशन

पहली मंजिल, दरबारी बिल्डिंग,

महात्मा गाँधी मार्ग, इलाहाबाद-211001

### Unit II 12 h

उपन्यास: सेवासदन-प्रेमचन्द

प्रकाशक: सुमित्र प्रकाशन

204 लीला अपार्टमेंट्स, 15 हेस्टिंग्स रोड

अशोक नगर इलाहाबाद-211001

### Unit III 12 h

कहानी-किरीट- डा उषा पाठक / डा अचला पाण्डेय

पाठ 1. उसने कहा था

पाठ 2. कफ़न,

पाठ 3. चीफ़ की दावत

प्रकाशक: राधाकृष्ण प्रकाशन दिल्ली

### Unit IV 12 h

पत्र लेखन: (औपचारिक या अनौपचारिक)

पुस्तक: व्याकरण प्रदीप – रामदेव

प्रकाशक: हिन्दी भवन 36 इलाहाबाद-211024

### Unit V 12 h

अनुवाद अभ्यास-III (केवल हिन्दी से अंग्रेजी में)

(पाठ 1 to 10)

प्रकाशक: दक्षिण भारत प्रचार सभा चेन्नई -17



Course Code	Course Name	Category	L	T	P	Credit
201TL1A2MA	MALAYALAM - II	LANGUAGE	4	1	-	3

### PREAMBLE

This course has been designed for students to learn and understand

- To develop the writing ability and develop reading skill.
- To learn various concepts and techniques for criticizing literature, to learn 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	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

**S Strong**

**M Medium**

**L Low**



201TL1A2MA	MALAYALAM -II	SEMESTER II
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**Total Credits: 3**

**Total Instruction Hours: 60 h**

### Syllabus

<b>Unit I</b>		12 h
Travelogue		
<b>Unit II</b>	Novel	12 h
Travelogue		
<b>Unit III</b>		14 h
Travelogue		
<b>Unit IV</b>		10 h
Autobiography		
<b>Unit V</b>		12 h
Autobiography		

### Text Books

- 1 Dubai Puzha (Travelogue) By K.Krishna Das, Published by Green books Thrissur.
- 2 Vazhithirivukal (Autobiography) By Dr.APJ Abdul Kalam Published by DC.Books Kottayam



Course Code	Course Name	Category	L	T	P	Credit
201TL1A2FA	FRENCH -II	LANGUAGE	4	1	-	3

## PREAMBLE

This course has been designed for students to learn and understand

- To Acquire Competence in General Communication Skills – Oral + Written – Comprehension & Expression.
- To Introduce the Culture, life style and the civilization aspects of the French people as well as of France.
- To help 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	To learn the adjectives and the classroom environment in France.	K2
CO3	Learn the Plural, Articles and the Hobbies.	K3
CO4	To learn the Cultural Activity in France.	K3
CO5	To learn 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	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

**S Strong**

**M Medium**

**L Low**



201TL1A2FA	FRENCH -II	SEMESTER II
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**Total Credits: 3**

**Total Instruction Hours: 60 h**

## Syllabus

### Unit I

12 h

<ul style="list-style-type: none"> <li>Proposer, accepter, refuser une invitation.</li> <li>Indiquer la date.</li> </ul>	Organiser une soirée au cinéma avec des amis, par téléphone et par courriel.	<ul style="list-style-type: none"> <li>Comprendre un message d'invitations sur un répondeur téléphonique.</li> <li>Inviter quelqu'un à accepter ou refuser l'invitation.</li> </ul>
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### Unit II

12 h

<ul style="list-style-type: none"> <li>Prendre et fixer un rendez-vous.</li> <li>Demander et indiquer l'heure.</li> </ul>	Organiser une soirée au cinéma avec des amis, par téléphone et par courriel.	<ul style="list-style-type: none"> <li>Comprendre des personnes qui fixent un rendez-vous par téléphonique.</li> <li>Prendre un rendez-vous par téléphone</li> </ul>
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### Unit III

12 h

<ul style="list-style-type: none"> <li>Exprimer son point de vue positif et négatif.</li> <li>S'informer sur le prix.</li> <li>S'informer sur la quantité.</li> <li>Exprimer la quantité.</li> </ul>	En groupes, choisir un cadeau pour un ami.	<ul style="list-style-type: none"> <li>Exprimer son point de vue sur des idées de cadeau.</li> <li>Faire des achats dans un magasin</li> </ul>
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### Unit IV

12 h

<ul style="list-style-type: none"> <li>Demander et indiquer une direction.</li> <li>Localiser (près de, en face de ....).</li> </ul>	Suivre un itinéraire à l'aide d'indications par téléphone et d'un plan.	<ul style="list-style-type: none"> <li>Comprendre des indications de direction.</li> <li>Comprendre des indications de lieu.</li> </ul>
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### Unit V

12 h

<ul style="list-style-type: none"> <li>Exprimer l'obligation et l'interdit.</li> <li>Conseiller.</li> </ul>	Par courrier électronique, donner des informations et des conseils à un ami qui veut voyager.	<ul style="list-style-type: none"> <li>Comprendre une chanson.</li> <li>Comprendre de courts messages qui expriment l'obligation ou l'interdiction</li> <li>Donner des conseils à des personnes dans des situations données.</li> </ul>
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## Text Books

- 1 LATITUDES 1 (Méthode de français) Pages from 56 to 101, Author : RÉGINE MÉRIEUX Publisher : GOYAL Publishers & Distributors Pvt



Course Code	Course Name	Category	L	T	P	Credit
201EL1A2EA	ENGLISH - II	LANGUAGE	4	-	1	3

### PREAMBLE

This course has been designed for students to learn and understand

- The effect of dialogue, the brilliance of imagery and the magnificence of varied genres
- The vocabulary and to frame 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	Interpret skills in communication and to shape their attitude	K2
CO2	Develop oral and written language skills in a business context	K3
CO3	Analyze to gain key strategies and expressions for communicating with professionals	K3
CO4	Inspect the knowledge to the corporate needs	K4
CO5	Formulate Inter and Intrapersonal skills	K5

### MAPPING WITH PROGRAMME OUTCOMES

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

**S Strong**

**M Medium**

**L Low**



<b>201EL1A2EA</b>	<b>ENGLISH - II</b>	<b>SEMESTER II</b>
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**Total Credits: 3**

**Total Instruction Hours: 60 h**

### **Syllabus**

**Unit I**      Technical English      12 h

Communication: Process- Methods- Channels- Barriers of Communications

Phonetics: Basics of phonetics - Consonants and Vowel sounds

Reading Skills: Skimming and Scanning- Reading Different Kinds of Texts- Types- Developing a Good Reading Speed

Writing Skills: Note- Making and note taking, Paragraph Writing: Structure and principles

**Unit II**      Business English      12 h

Structure and Planning of Letters: Elements of Structure- Forms of Layout- Style- Writing Business Letters

Quotation, Order and Tender: Inviting - Sending Quotation letter - Placing Orders- Inviting Tenders

E-mail Correspondence: Structure- Procedure- Style- Guidelines- Jargon and Acronyms- Security Precaution

Seminar and Meetings: Introduction- Organizing a Seminar- Sample Brochure- Conducting and Participating in a Meeting

**Unit III**      Professional English      12 h

Report Writing: Importance- Process- Types- Structure

Memo: Importance- Structure

Notice, Agenda and Minutes: Meeting- Notice- Agenda- Minutes: Preparation- Structure- Delivery

Brochures: Purpose- Audience- Qualities

**Unit IV**      Employment Communication      12 h

Resume Writing : Elements of Resume - difference between CV and Resume - Writing Job Application

Art of Conversation: Small Talk- Body Language- Principles of Good Conversation

Interview: Organizational role- Goals- Types- Interview Process

Group Discussion: Importance- Features- Strategies- Barriers





**Unit V      Soft Skills**

12 h

Self - Discovery and Goal Setting: Self - Discovery - Goals and Types- Benefits, Areas and Clarity of Goal Setting

Positive Thinking (PT) and Attitude: Benefits of PT and Attitude- Develop Positive Attitude and Thinking- Drive out Negative Thinking and Attitude

Etiquettes and Manners: Home, Table and Business, Time Management

**Text Books**

- 1 Prabha, Dr. R. Vithya & S. Nithya Devi. 2019. Sparkle. (1st Edn.) McGraw - Hill Education. Chennai. [Unit I - V]

**References**

- 1 Ghosh, B.N. Editor. 2017. Managing Soft Skills for Personality Development. McGraw - Hill Education, Chennai.
- 2 Adams, Katherine L. and Gloria I. Galanes. 2018. Communicating in Groups- Applications and Skills. McGraw - Hill Education, Chennai.
- 3 Koneru, Aruna. 2017. Professional Communication. McGraw - Hill Education, Chennai.
- 4 Koneru, Aruna. 2011. English Language Skills. McGraw - Hill Education, Chennai.



Course Code	Course Name	Category	L	T	P	Credit
204CG1A2CA	OPERATING SYSTEMS	CORE	4	1	-	4

### PREAMBLE

This course has been designed for students to learn and understand

- To learn Windows OS and parts of a window Operating System
- To use the Windows Server to practice performing common tasks
- To know the functionality of Shell Scripting and System Monitoring

### COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the windows-client based applications and desktop features	K1, K2
CO2	Rehearsal the procedure of Microsoft System Center Configuration Manager	K2
CO3	Learn Windows Operating Systems - Storage Services	K3
CO4	Customize the user options with PowerShell Scripting in Window OS	K3
CO5	Implement the monitoring set-up in Window Server	K3

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	L	S	S	S
CO2	S	S	S	M	L
CO3	M	M	L	S	M
CO4	M	S	M	L	L
CO5	L	L	S	M	M

**S Strong**

**M Medium**

**L Low**



<b>204CG1A2CA</b>	<b>OPERATING SYSTEMS</b>	<b>SEMESTER II</b>
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**Total Credits: 4**

**Total Instruction Hours: 60 h**

### **Syllabus**

**Unit I** Windows OS 12 h

Introducing Windows 10 - Overview of Deploying Windows 10 - Configure Devices and drivers - Perform Post installation configuration task - Managing Apps in Windows - Course Conclusion.

**Unit II** MS SCCM Basics 12 h

Overview of System Center 2019 R2 Configuration Manager - Planning and Deploying a Stand-Alone Primary Site - Planning and Configuring Role-Based Administration - Planning and Deploying a Multiple-Site Hierarchy - Replicating Data and Managing Content in Configuration Manager 2019 - Planning Resource Discovery and Client Deployment - Configuring Internet and Cloud-Based Client Management - Maintaining and Monitoring System Center 2019 Configuration Manager.

**Unit III** Storage 12 h

What is SAN - FC SAN Evolution - Components of SAN: Node Ports - SAN interconnectivity options - Port Types - Fabric Technology - Fabric Topology - Zoning Components - Block Storage over IP components - iSCSI, FCIP, Switch Models.

**Unit IV** Power Shell Scripting 12 h

PowerShell Scripting - Meeting Windows PowerShell - Using the Help System - Running Commands - Array and Hash Tables - Connecting Commands in the Pipeline - Working with Providers - Extending the Shell - Working with Objects Tips and Tricks Around Day's Topic - Formatting (List, Table, Wide) - Filtering and Comparisons (PowerShell Operators) - Loops Available - Remote Control [1:1 and 1:N(Many)] - Inbuilt Security - Variables(User Defined, System, Environmental Variables) - Using Windows Management Instrumentation - PowerShell Functions



**Unit V**      Monitoring

12 h

Overview of System Center 2019 R2 Operations Manager: Operations Manager Components. Planning & Installation: Deployment Scenarios - Order of Installation - Installation Process - SQL Server Configuration - Operations Console - Web Console. Administration: Agent Deployment - Security of manual agent - Agent and Agent less managed systems - Role Based Security-Reporting server - Object Discovery. Management Packs: Management Pack Overview - Pre-Installed Management Packs - Importing Management Packs - Overrides. Module 5: Operations Manager Monitoring - Monitoring Overview - Overriding of MPs - Creating Rules and Monitors - Agentless Monitoring - Demo on Role Based Security - Creating Groups - Configuring Notifications. Operations Manager Reporting - Installing SQL Reporting Services - Installing Operations Manager Reporting - Creating, Viewing and Customizing Reports - Dashboard - Considerations for High Availability and Disaster Recovery.

**Text Books**

- 1 Course Material - TATA Consultancy Services



Course Code	Course Name	Category	L	T	P	Credit
204CG1A2CB	DATA STRUCTURES AND ALGORITHMS	CORE	4	1	0	4

### PREAMBLE

This course has been designed for students to learn and understand

- The basics of Data Structure Algorithms
- The essential need of Hash Table, Sorting and Searching techniques
- The analysis of data dispensation in Trees and Graphs

### COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Define the basic terminologies of Algorithms and Data Structures	K1
CO2	Apply Stack and Queue techniques on applications	K2
CO3	Construct Linked Lists and Hash Table for data handling	K3
CO4	Trace the data elements by performing Sorting and Searching techniques	K3
CO5	Build the Trees & Graphs	K3

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	M	S	M	L
CO2	L	S	L	S	S
CO3	M	M	M	M	M
CO4	M	S	M	S	S
CO5	L	S	S	S	M

**S Strong**

**M Medium**

**L Low**



204CG1A2CB	DATA STRUCTURES AND ALGORITHMS	SEMESTER II
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**Total Credits:** 4

**Total Instruction Hours:** 60 h

### Syllabus

#### **Unit I** Introduction to Algorithm & Data Structures 12 h

Introduction: History of Algorithms - Definition - Structure & Properties - Development - Data Structures & Algorithms - Definition & Classification. Analysis of Algorithms: Efficiency of Algorithms - Apriori Analysis - Asymptotic Notations - Time Complexity - Average-Best & Worst Case Complexities Performance Analysis. Arrays: Operations - Elements in an Array - Representation of Arrays in Memory.

#### **Unit II** Stacks and Queues 12 h

Stacks: Introduction - Stack Operations: Stack Implementation - Implementation of push and pop - Applications: Recursive programming - Evaluation of Expressions. Queues: Introduction - Operations on Queues - Implementation - Limitations of Linear Queues - Circular Queue - Operations on a Circular Queue - Implementation - Other Types of Queues: Priority Queues - Deques - Applications.

#### **Unit III** Linked Lists and Hash Tables 12 h

Linked Lists: Introduction - Singly Linked Lists - Circularly Linked Lists: Primitive Operation - Other Operations on Circularly Linked Lists - Doubly Linked Lists: Operations on doubly Linked Lists - Delete Operation - Applications: Sparse matrix representation. Hash Tables: Introduction - Hash Table Structure - Hash Functions - Linear Open Addressing - Chaining.

#### **Unit IV** Sorting and Searching 12 h

Internal Sorting: Introduction - Bubble Sort - Insertion Sort - Selection Sort - Merge Sort: Two-way Merging - Performance analysis - K-Way merging - Shell Sort - Quick Sort: Quick sort procedure - Stability and performance analysis - Heap Sort: Construction of heap - Heap sort procedure. Searching: Introduction - Linear Search - Binary Search - Fibonacci Search - Other Search Techniques.

#### **Unit V** Trees and Graphs 12 h

Trees: Introduction - Definition and Basic Terminologies - Representation of Trees - Binary Trees: Basic Terminologies- Types of Binary Trees - Representation of Binary Trees: Array representation - Linked representation - Binary Tree Traversals.



Graphs: Introduction - Definitions and Basic Terminologies - Representations of Graphs: Sequential Representations - Linked representation - Graph Traversals.

### Text Books

- 1 Vijayalakshmi Pai. G.A, (2008), "Data Structures and Algorithms Concepts, Techniques and Applications", (1st Edn.), TMH.

### References

- 1 Hemant Jain, (2017), "Problem Solving in Data Structures & Algorithms Using C", (1st Edn.), Taran Technologies Pvt Ltd.
- 2 Balagurusamy. E, (2013), "Data Structures Using C", (1st Edn.), TMH.
- 3 Ashok N. Kamthane, (2009), "Introduction to Data Structures in C", (1st Edn.), Pearson Education.



<b>204CG1A2CP</b>	<b>CORE PRACTICAL: OPERATING SYSTEMS</b>	<b>SEMESTER- II</b>
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**Total Credits: 2**

**Total Instructions Hours: 48h**

**S.No**

**List of Experiments**

- 1 Installation of client Windows10 OS in Virtual machine.
- 2 Installation of Windows server 2019 R2OS in Virtual machine.
- 3 Add roles and features in Windows Server 2019 R2.
- 4 Disk Partitioning in MBR and GPT.
- 5 Demonstrate - Server Backup Operation.
- 6 Configuring Active Directory Domain Service.
- 7 Configuring, managing and installation of DNS.
- 8 Configuring, managing and installation of DHCP.
- 9 IIS configuration and deployment in Windows Server 2019 R2.
- 10 Mapping network drive in Windows Server 2019 R2.
- 11 Configure User and Device Claim Types.
- 12 Create and Configure Resource Properties and Lists.

**Note:** Out of 12 - 10 Mandatory

**References**

- 1 Lab Manual - TATA Consultancy Services





Course Code	Course Name	Category	L	T	P	Credit
202PY1A2IE	DIGITAL COMPUTER FUNDAMENTALS	IDC	4	0	0	4

### PREAMBLE

This course has been designed for students to learn and understand

- The knowledge of Digital Computers and Number System
- The basics of Laws, Gates and Circuit design
- To impart the knowledge of Logic families, Memory and Microprocessors

### COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the fundamental knowledge of Digital Electronics	K1
CO2	Identify and describe the Boolean Algebra laws, Logic Gates with Circuit design	K2
CO3	Outline the operation of Sequential Circuits, Registers and Counters	K3
CO4	Describe the different types of Components, Circuits and Semiconductor Memories	K2
CO5	Employ the 8085 Microprocessor with Instruction Set	K3

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	L	L	M	M
CO2	M	S	M	S	L
CO3	M	M	M	S	S
CO4	S	S	S	M	L
CO5	M	S	S	L	S

**S Strong**

**M Medium**

**L Low**



<b>202PY1A2IE</b>	<b>DIGITAL COMPUTER FUNDAMENTALS</b>	<b>SEMESTER II</b>
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**Total Credits: 4**

**Total Instruction Hours: 48 h**

### Syllabus

#### **Unit I**      Digital Computers and Number System 10 h

Introduction to Digital Computers: Typical Microcomputer Organization - Computer Languages - Types of Software - Computer Applications. Number System & Binary Codes: Digital Electronics - Integrated Circuits - Binary System - Decimal System - Octal System - Hexadecimal System - Binary Addition - Multiplication and Division - 1's Complement - Binary Coded Decimal Numbers (BCD) - Excess-3 Code.

#### **Unit II**      Logic Gates and Circuit Design 10 h

Boolean Algebra - Logic Gates: AND - OR - Inverter or NOT Gate - NOR Gate - NAND Gate - Exclusive OR Gate - Exclusive NOR Gate - De Morgan's Theorems - Karnaugh Map (Up to 4 variables). Arithmetic and Logic Circuits: Half Adder - Full Adder - Half Subtractor - Full Subtractor.

#### **Unit III**      Sequential Circuits and Registers 09 h

Sequential Circuits: Flip-Flops - R-S Flip-Flops - Clock Signals - Clocked R-S Flip-Flop - D Flip-Flop - T Flip-Flop - Master Slave J K Flip-Flop. Registers and Counters: Registers - Shift Registers - Shift-left Register - Shift-right Register - Decoders (3 to 8 line Decoder) - Encoders - Counters - Programmable Counter.

#### **Unit IV**      Logic Families and Memory 09 h

Logic Families: Characteristics of IC Logic Families - Resistor Transistor Logic (RTL) - Diode Transistor Logic (DTL) - Metal Oxide Semiconductor (MOS). Semiconductor Memories: Memory Unit - Concept of Memory using Registers - Read Only Memories - Random Access Memories - Programmable Array Logic (PAL) - Programmable Logic Array (PLA) - Buffer - Cache Memory.

#### **Unit V**      8085 Microprocessor 10 h

Microprocessors: Evolution - Microprocessor Architecture 8085 - Microprocessor Bus Organization - Functional Block Diagram of 8085 Microprocessor - Pin Out Diagram of 8085 - Microprocessor Programming - Instruction Set of 8085 - Input / Output (I/O) Schemes - Data Transfer Schemes.



## Text Book

- 1 Puri V.K., (2017), Digital Electronics Circuits and Systems. (1st Edn.) New Delhi: TMH.

## References

- 1 Salivahanan. S and Arivazhagan.S (2018), Digital Circuits and Design. (5th Edn.) Noida: Oxford University Press.
- 2 Morris Mano. M. (2012), Digital Logic and Computer Design. (1st Edn.) New Delhi: PHI.
- 3 Ramesh Gaonkar S. (2010), Microprocessor Architecture, Programming and Applications with the 8085. (5thEdn.) New Delhi: PIP.



Course Code	Course Name	Category	L	T	P	Credit
196BM1A2AA	HUMAN RIGHTS	AECC	2	-	-	2

## PREAMBLE

This course has been designed for students to learn and understand

- To study how human values and personality traits help to develop the characteristics of each individual
- Understanding the moral values towards the enrichment of the society
- Identify the impact of ethics and values on the global development of the current scenario

## 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 human values, personality traits and character formation.	K2
CO2	Acquire the knowledge through value education towards national and global development.	K1
CO3	Introduce the basic concepts of conflict, emotions and adolescent emotions.	K1
CO4	Illustrate the techniques in therapeutic measures like yoga and meditation.	K2
CO5	Learn the concepts of human rights, rights for women and children and domestic violence.	K3

## MAPPING WITH PROGRAMME OUTCOMES

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

**S Strong**

**M Medium**

**L Low**



<b>196BM1A2AA</b>	<b>HUMAN RIGHTS</b>	<b>SEMESTER II</b>
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**Total Credits: 2**

**Total Instruction Hours: 24 h**

### **Syllabus**

#### **Unit I Introduction to Human Values 05 h**

Concept of Human Values - Value Education Towards Personal Development - Aim of education and value education - Evolution of value oriented education - Concept of Human values - Types of values - Components of value education - Personal Development: Self analysis and introspection - Sensitization towards gender equality - Physically challenged - Intellectually challenged - Respect to age - Experience - Maturity - Family members - Neighbours - Co-workers - Character Formation towards Positive Personality: Truthfulness - Constructivity - Sacrifice - Sincerity - Self Control - Altruism - Tolerance - Scientific Vision.

#### **Unit II Value Education and Social Values 05 h**

Value Education Towards National and Global Development National and International Values: Constitutional or national values - Democracy - Socialism - Secularism - Equality - Justice - Liberty - Freedom and fraternity -Social Values - Pity and probity - Self control - Universal brotherhood - Professional Values - Knowledge thirst - Sincerity in profession - Regularity - Punctuality and faith - Religious Values - Tolerance - Wisdom - Character - Aesthetic values - Love and appreciation of literature and fine arts and respect for the same - National Integration and international understanding.

#### **Unit III Global Development on Ethics and Values 04 h**

Impact of Global Development on Ethics and Values: Conflict of cross-cultural influences - Mass media - Cross-border education - Materialistic values - Professional challenges and compromise - Modern Challenges of Adolescent Emotions and behave or Sex and spirituality: Comparison and competition - Positive and negative thoughts - Adolescent Emotions - Arrogance - Anger - Sexual instability - Selfishness - defiance.

#### **Unit IV Yoga and Meditation 05 h**

Therapeutic Measures: Control of the mind through - Simplified physical exercise - Meditation - Objectives - Types - Effect on body - Mind - Soul - Yoga - Objectives - Types - Asanas - Activities: Moralisation of Desires -Neutralisation of Anger - Eradication of Worries - Benefits of Blessings.





**Unit V** Human Rights and Rights of Women and Children

05 h

Human Rights - Concept of Human Rights – Indian and International Perspectives  
 - Evolution of Human Rights - Definitions under Indian and International documents - Broad classification of Human Rights and Relevant Constitutional Provisions - Right to Life - Liberty and Dignity - Right to Equality - Right against Exploitation - Cultural and Educational Rights - Economic Rights - Political Rights - Social Rights - Human Rights of Women and Children - Social Practice and Constitutional Safeguards - Female Foeticide and Infanticide - Physical assault and harassment - Domestic violence - Conditions of Working Women - Institutions for Implementation - Human Rights Commission - Judiciary - Violations and Redressal Violation by State - Violation by Individuals - Nuclear Weapons and Terrorism Safeguards.

**References**

- 1 Brain Trust Aliyar, 2008, Value Education for health, happiness and harmony. Vethathiri publications, Erode
- 2 Grose. D. N, 2005, A text book of Value Education. Dominant Publishers and Distributors, New Delhi.
- 3 Yogesh Kumar Singh & Ruchika Nath, 2005, Value Education, P. H Publishing Corporation, New Delhi.
- 4 Venkataram & Sandhiya. N, 2001, Research in Value Education, APH Publishing Corporation, New Delhi.
- 5 Seetharam. R. (Ed), 1998, Becoming a better Teacher Madras Academic Staff College.
- 6 Brain Trust Aliyar, 2004, Value Education for Health, Happiness and Harmony. Vethathiri publications, Erode.
- 7 Swami Vivekananda, 2008, Personality Development. Advaita Ashrama, Kolkata.
- 8 Dey A. K, 2002, Environmental Chemistry. New Delhi - Vile Dasas Ltd.



Bos Chairman / HoD  
 Dept. of Computer Science with Cognitive Systems  
 Dr. N. G. P. Arts and Science College  
 Coimbatore - 641 048



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B.Sc. Computer Science with Cognitive Systems (Students admitted during the AY 2020-21)

Course Code	Course Category	Course Name	L	T	P	Exam (hours)	Max Marks			Credits
							CIA	ESE	Total	
Third Semester										
Part - I										
191TL1A3TA	Language - I	Tamil-III	3	1	0	3	25	75	100	3
191TL1A3HA		Hindi-III								
191TL1A3MA		Malayalam-III								
191TL1A3FA		French - III								
Part - II										
191EL1A3EA	Language - II	English - III	4	0	0	3	25	75	100	3
Part - III										
204CG1A3CA	Core - IV	Computer Networks	3	0	0	3	25	75	100	3
204CG1A3CP	Core Practical - IV	Computer Networks	0	0	4	3	40	60	100	2
202MT1A3IE	IDC - III	Optimization Techniques	4	0	0	3	25	75	100	4
204CG1A3SA	SEC - I	Programming in Python	3	0	0	3	25	75	100	3
204CG1A3SP	SEC Practical - I	Python Programming	0	0	4	3	40	60	100	2
	GE - I		2	0	0	3	-	50	50	2
	LoP	Lab on Project	-	-	-	-	-	-	-	-
Part - IV										
191TL1A3AA	AECC - III	Basic Tamil	2	0	0	3	-	50	50	2
191TL1A3AB		Advanced Tamil								
195CR1A3AA		Women's Rights								
Total			21	1	8				800	24



### GENERIC ELECTIVE COURSES (GE)

The following are the courses offered under Generic Elective Course

Semester III (GE-I)

S. No.	Course Code	Course Name
1	204CG1A3GA	Computing and Internet Technology

### EXTRA CREDIT COURSES

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

S. No.	Course Code	Course Name
1	204CG1ASSA	Cognitive Skills for IT
2	204CG1ASSB	Web Technology





Course Code	Course Name	Category	L	T	P	Credit
191TLIA3TA	தமிழ்த் தாள்- III	மொழி-I	3	1	-	3

## PREAMBLE

This course has been designed for students to learn and understand

- மொழிப்பாடங்களின் வாயிலாக தமிழரின் பண்பாடு , 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) – மாணவனின் செயலாக்கத்திறனை ஊக்குவித்தல்	K1,K2,K3
CO2	மதிப்புக்கல்வி (Attitude and Value education)	K2,K4
CO3	பாட இணைச்செயல்பாடுகள் (Co-curricular activities)	K2,K3,K4
CO4	சூழலியல் ஆக்கம் (Ecology)	K4
CO5	மொழி அறிவு(Tamil knowledge)	K5

## MAPPING WITH PROGRAMME OUTCOMES

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

**S Strong**

**M Medium**

**L Low**



191TLIA3TA	பகுதி – 1 : தமிழ் தாள் : 3	SEMESTER III
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Total Credits: 3

Total Instruction Hours: 48 h

### Syllabus

#### Unit I

10 h

1. காப்பியங்களின் தோற்றமும் வளர்ச்சியும்
2. சிலப்பதிகாரம் – மனையறம் படுத்த காதை
3. மணிமேகலை – வஞ்சிமாநகர் புக்க காதை

#### Unit II

10 h

1. கம்பராமாயணம் – கும்பகர்ணன் வதைப்படலம் (பா. எண் : 60 – 100)
2. பெரிய புராணம் – அதிபத்தநாயனார் புராணம்

#### Unit III

10 h

1. சிற்றிலக்கியங்களின் தோற்றமும் வளர்ச்சியும்
2. தமிழ்விடு தூது – தூதுப்பொருள்கள் மட்டும் 101 முதல் 112 வரை (12 கண்ணிகள்)
3. திருக்குற்றாலக்குறவஞ்சி – வசந்தவல்லி பந்தாடிய சிறப்பு (6: 4 கண்ணிகள்)
4. கலிங்கத்துப்பரணி – களம் பாடியது (போர்க்களக் காட்சி – பா.எண்: 472–502)

#### Unit IV

10 h

1. நாடகங்களின் தோற்றமும் வளர்ச்சியும்
2. நாடகம் - ஒளவை-ஆசிரியர் இன்குலாப்

#### Unit V

08 h

1. 'பா' வகைகள் : வெண்பா, ஆசிரியப்பா, கலிப்பா, வஞ்சிப்பா - பொது இலக்கணம் மட்டும்.
2. அணி: உவமையணி, உருவக அணி, இல்பொருள் உவமையணி விளக்கம், உதாரணம்.

3. பயிற்சிப்பகுதி  
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ஆ) வாசகர் கடிதம்: நாளிதழ், வானொலி, செய்தி ஊடகங்களுக்கு  
விமர்சனம் எழுதுதல்.

## Text Books

- 1 மொழிப்பாடம் - 2020, தொகுப்பு : தமிழ்த்துறை , டாக்டர் என்.ஜி.பி. கலை அறிவியல் கல்லூரி.
- 2 இன்குலாப் – 2017. ஒளவை (நாடகம்), அன்னம் வெளியீடு, சென்னை.

## References

- 1 புலவர் சோம. இளவரசு - 2014. இலக்கிய வரலாறு , மணிவாசகர் பதிப்பகம் , சென்னை – 108,
- 2 பேராசிரியர் முனைவர் பாக்யமேரி – முதற் பதிப்பு 2013 , இலக்கணம் இலக்கிய வரலாறு மொழித்திறன், பூவேந்தன் பதிப்பகம், சென்னை.
- 3 இணையதள முகவரி : [www.tamilvirtual.com](http://www.tamilvirtual.com)



Course Code	Course Name	Category	L	T	P	Credit
191TL1A3HA	HINDI-III	Language - I	3	1	-	3

### PREAMBLE

This course has been designed for students to learn and understand

- To develop the writing ability and develop reading skill.
- To learn various concepts and techniques for criticizing literature, to learn 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	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

**S Strong**

**M Medium**

**L Low**



191TL1A3HA	HINDI-III	SEMESTER III
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**Total Credits:** 03

**Total Instruction Hours:** 48 h

### Syllabus

#### Unit I 10 h

पद्य – काव्य पराशर (भोलानाथ)

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

प्रकाशक: जवाहर पुस्तकालय

सदर बाजार, मथुरा

उत्तर प्रदेश - 281001

#### Unit II 10 h

हिन्दी साहित्य का इतिहास: (साधारण ज्ञान)

आचार्य रामचन्द्र शुक्ल

लोकभारती प्रकाशन इलाहाबाद

#### Unit III 10 h

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

प्रकाशक: विनोद पुस्तक मंदिर

आगरा - 282002

#### Unit IV 10 h

संवाद लेखन

पुस्तक: व्याकरण प्रदिप - रामदेव

प्रकाशक: हिन्दी भवन 36 इलाहाबाद - 211024

#### Unit V 08 h

अनुवाद अभ्यास-III (केवल हिन्दी से अंग्रेजी में)

(पाठ 10 to 20)

प्रकाशक: दक्षिण भारत प्रचार सभा चेन्नई -17



Course Code	Course Name	Category	L	T	P	Credit
191TL1A3MA	MALAYALAM - III	Language - I	3	1	-	3

### PREAMBLE

This course has been designed for students to learn and understand

- To develop the writing ability and develop reading skill.
- To learn various concepts and techniques for criticizing literature, to learn 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	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

**S Strong**

**M Medium**

**L Low**



191TL1A3MA	MALAYALAM - III	SEMESTER III
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**Total Credits: 3**

**Total Instruction Hours: 48 h**

### Syllabus

<b>Unit I</b>	10 h
Kumaranasan	
<b>Unit II</b>	10 h
Kumaranasan	
<b>Unit III</b>	10 h
Kumaranasan	
<b>Unit IV</b>	10 h
Kavyanchali Collection of Poems.	
<b>Unit V</b>	08 h
Kavyanchali Collection of Poems.	

### Text Books

- 1 Chinthavishtayaya Sitha By Kumaranasan DC.Books Kottayam
- 2 Kavyanchali -Group of Authors DC.Books Kottayam

### References

- 1 Kavitha Sahithya Charithram -Dr.M.Leelavathy Sahithya academy Thrissur.



Course Code	Course Name	Category	L	T	P	Credit
191TL1A3FA	FRENCH-III	Language - I	3	1	-	3

### PREAMBLE

This course has been designed for students to learn and understand

- To Acquire Competence in General Communication Skills – Oral + Written – Comprehension & Expression.
- To Introduce the Culture, life style and the civilization aspects of the French people as well as of France.
- To help 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	To learn the adjectives and the classroom environment in France.	K2
CO3	Learn the Plural, Articles and the Hobbies.	K3
CO4	To learn the Cultural Activity in France.	K4
CO5	To learn 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	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

**S Strong**

**M Medium**

**L Low**





191TL1A3FA	FRENCH-III	SEMESTER III
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**Total Credits: 3**

**Total Instruction Hours: 48 h**

### Syllabus

**Unit I      Excuses et vœux** 10 h

**Compétence Culturelle :** Convivialité - (lieux et société, - l'apéritif)

**Compétence de Communication**

- **INTERACTION ORALE:** Accueillir quelqu'un, s'excuser, remercier
- **RÉCEPTION ORALE:** Comprendre des annonces enregistrées
- **RÉCEPTION ÉCRITE:** Comprendre une affiche
- **PRODUCTION ÉCRITE:** Écrire des cartes de vœux

**Compétence Grammatical**

Pronoms personnels toniques moi, je...; toi...tu - Pronoms personnels objets Me, te, le... - Les verbes en -er comme appeler, acheter - Les adjectifs possessifs nos, vos, leurs

**Unit II      Bravo et merci** 8 h

Communication et technologies (le portable, internet)

- **INTERACTION ORALE:** Interagir au téléphone, féliciter
- **RÉCEPTION ORALE:** Comprendre une émission à la radio
- **RÉCEPTION ORALE:** Comprendre une définition
- **PRODUCTION ÉCRITE:** Écrire des plaques commémoratives

Oui, que - Le passé composé - Le participe passé - J'ai eu, elle a été -  
Longtemps, pendant ..., de... à

**Unit III      Faire et dire** 10 h

Jeunes : enquête

- **INTERACTION ORALE:** Demander de l'aide, donner des instructions
- **RÉCEPTION ORALE:** Comprendre un message enregistré
- **RÉCEPTION ÉCRITE :** Comprendre un article d'un magazine de consommateurs
- **PRODUCTION ÉCRITE :** Écrire un règlement

- du, de la (de l'), des, de

**Unit IV      Faire ci ou faire ça** 10 h

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COIMBATORE INDIA  
es vacances des Français

- **INTERACTION ORALE :** Proposer quelque chose, accepter, refuser
- **RÉCEPTION ORALE :** Comprendre une émission de cuisine
- **RECEPTION ÉCRITE :** Comprendre une brochure d'informations
- **PRODUCTION ÉCRITE :** Ecrire un texte de promotion touristique

S'il y a du soleil : L'hypothèse (supposition, Condition) la préposition Si + indicatif  
 Sinon... ou + indicatif - Sortir, partir - Quelques, plusieurs - Le long de - Au milieu de... - Au sommet de...

## **Unit V      Dialogue writing**

10 h

1. Au Restaurant
2. A la poste
3. A L' Aeroport
4. A La Gare
5. Chez Le Medecin

## **Text Books**

- 1 Marcella Di Giura Jean-Claude Beacco, Alors II. Goyal Publishers Pvt Ltd 86, University Block ,Jawahar Nagar (Kamla Nagar), New Delhi – 110007



Course Code	Course Name	Category	L	T	P	Credit
191EL1A3EA	ENGLISH - III	Language II	4	0	0	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	Learn English grammar and its specific usage	K2
CO2	Know the methods of improving reading skills	K3
CO3	Understand the importance of speaking skills and developing it through various practices	K3
CO4	Comprehend the basic steps of reading and its necessity	K3
CO5	Acquire the writing skills and mandatory similar practices	K4

### MAPPING WITH PROGRAMME OUTCOMES

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

**S Strong**

**M Medium**

**L Low**



<b>191EL1A3EA</b>	<b>ENGLISH - III</b>	<b>SEMESTER III</b>
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**Total Credits: 3**

**Total Instruction Hours: 48 h**

### **Syllabus**

**Unit I** Basics of English 10 h

Phrasal verb - Notions and Conventional Idiomatic Expressions - One-Word Substitution - Word Formation - Homophones - Spelling - Sentence Completion - Sentence Pattern

**Unit II** Listening 08 h

Listening and Hearing - Principles of listening - Types of listening - incidental listening - active and effective listening - discriminative listening - critical listening - listening vs practice - Barrier to Listening - Guidelines for Improving Listening

**Unit III** Speaking 10 h

Monologues - Dialogue - Role Play - JAM (Just A Minute talk) - Debate - Public Speaking - Group Discussion - Interview - Showing Directions - Accent and Neutralization

**Unit IV** Reading 10 h

Mechanics of Reading - Types of Reading - Summarization - Paraphrasing - Analysis and Interpretation - Reading Comprehension - Reading with purpose and making predictions - Cloze Passage

**Unit V** Writing 10 h

Paraphrase Writing - Techniques and Methods of Paraphrasing - Precis Writing - Difference between Paraphrase and Precis - review writing - Hints Developing - Editorial Writing - Tabloid - Column Writing



## Text Books

- 1 Bhatnagar R. P. 2013. English for Competitive Examinations. Macmillan Publishers, Chennai.
- 2 Koneru Aruna. 2011. English Language Skills. McGraw Hill Education, Chennai.

## References

- 1 Radhakrishna Pillai G. 2000. English for Success. Emerald Publishers, Chennai.
- 2 Gauri Mishra, Ranjana Kaul. 2016. Language Through Literature. Primus Books, New Delhi.
- 3 Miles Craven. 2008. Cambridge English Skills Real Listening and Speaking. First Edition, Cambridge University Press, India.
- 4 Teaching Adult: A Literary Resource Book. 2012. New Readers Press, New York, United States.



Course Code	Course Name	Category	L	T	P	Credit
204CG1A3CA	COMPUTER NETWORKS	CORE	3	-	-	3

## PREAMBLE

This course has been designed for students to learn and understand

- Fundamental concept of computer networks
- IP Addressing and Subnet configuration with protocols
- Routing algorithms and tool based Network Monitoring

## COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the different aspects of networks and protocols.	K1
CO2	Examine various IP addresses and version.	K2
CO3	Analyze and compare different protocols and subnet.	K3
CO4	Implement the routing algorithms for a network.	K3
CO5	Apply the CICS tool to monitor the network devices	K3

## MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	M	L	M	L
CO2	M	S	L	S	M
CO3	L	S	L	L	L
CO4	M	M	S	M	S
CO5	S	S	M	M	S

**S Strong**

**M Medium**

**L Low**



<b>204CG1A3CA</b>	<b>COMPUTER NETWORKS</b>	<b>SEMESTER III</b>
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**Total Credits: 3**

**Total Instruction Hours: 36 h**

### **Syllabus**

#### **Unit I** Introduction to Computer Networks **8 h**

Introduction - Applications - LAN - WAN - MAN - Network Hardware - Network Software: Protocol Hierarchies - Connection-oriented and connectionless Services. Reference Models: OSI Reference Model - TCP/IP reference Model - Comparison of OSI and TCP/IP.

#### **Unit II** IP Addressing **7 h**

IP Addressing Version 4 - IP Addressing Version 6 - The Hierarchy of IP Addresses - Network and host addressing - Classes of IP addresses - Understanding network ID, host ID, and subnet masks - Subnetting Basics - IP Address Class and Subnet Mask - Variable -Length Subnet Masks (VLSMs) - Internet Protocol Version 6 (IPv6) - The Benefits of IPv6 - Configuring IPv6 - Routing with IPv6 - Migrating to IPv6.

#### **Unit III** Advanced Subnetting **7 h**

Subnetting Advanced VLSM - Switch Basic - VLAN - VTP / CDP - Subnetting Basic Version 4 - Benefits of VLANs - Managing VLANs - VLAN Trunking - VLAN Trunking Protocol (VTP) - Routing Traffic from One VLAN to Another - Cisco Discovery Protocol (CDP).

#### **Unit IV** Network Algorithms **7 h**

Routing Algorithms - Congestion Control Algorithms - CISCO IOS / Managing /Password recovery - Routing Dynamic Routing protocols OSPF RIP EIGRP - Network Advanced Routing Dynamic Routing protocols - OSPF RIP EIGRP.

#### **Unit V** Network Devices Monitoring **7 h**

Monitoring Network Devices - Overview of ACL\NAT\WAN\Wireless -The Purpose of Access Lists - Types of ACLs - Creating ACLs - Network Address Translation (NAT) - Purpose of NAT - Operational Flow of NAT - Wide-Area Networking Basics - Connection Types - Encapsulation Types



## Text Books

- 1 SilviuAngelescu, (2010), "CCNA Certification All-in-One For Dummies", (1st Edn.), For Dummies, Wiley Publishing Inc.

## References

- 1 David J.Wetherall, Andrew S.Tanenbaum, (2013), "Computer Networks", (5th Edn.), Pearson Education.
- 2 Behrouz A. Forouzan, (2017), "Data Communication and Networking", (4th Edn.), TMH.
- 3 SilviuAngelescu, (2010), "CCNA Certification All-In-One For Dummies", (1st Edn.), Wiley Publishing Inc.





204CG1A3CP	CORE PRACTICAL: COMPUTER NETWORKS	SEMESTER III
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Total Credits: 2  
Total Instructions Hours: 48 h

S.No	List of Experiments
1	Study of Network Devices in Detail.
2	Study of network IP.
3	Connect the computers in Local Area Network.
4	Performing an Initial Switch Configuration.
5	Performing an Initial Router Configuration.
6	Connecting a Switch
7	Monitoring Network Devices.
8	Exploring Different LAN Switch Options.
9	Observing Static and Dynamic Routing.
10	Examining Network Address Translation (NAT).
11	Configuring a Cisco Router as a DHCP Server.
12	Building a Network Topologies with Cisco Packet Tracer Program.

**Note:** Out of 12 - 10 Mandatory



Course Code	Course Name	Category	L	T	P	Credit
202MT1A3IE	OPTIMIZATION TECHNIQUES	IDC	4	-	-	4

### PREAMBLE

This course has been designed for students to learn and understand

- the optimal use of available resources.
- the strategies thinking to be applied in business
- the transportation and the assignment problem

### COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Define the problem in the form of linear programming problem.	K1
CO2	Compute the optimum solution for any form of transportation problem.	K3
CO3	Explain the way of job assignment to opted persons.	K2
CO4	Compute value of the game with mixed strategies.	K3
CO5	Analyzing the PERT and CPM network technique.	K3

### MAPPING WITH PROGRAMME OUTCOMES

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

**S Strong**

**M Medium**

**L Low**



202MT1A3IE	OPTIMIZATION TECHNIQUES	SEMESTER III
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**Total Credits:** 4

**Total Instruction Hours:** 48 h

### Syllabus

**Unit I**      Linear Programming Problem      10 h

Introduction - Basic assumptions - advantages - application areas of linear programming- formulating a problem as an LP model - Examples of LP model - Graphic method of solution- Some special cases.

**Unit II**      Transportation Problem      10 h

Formulating Transportation model - LP formulation of the transportation- solution procedure - methods for finding initial solution-test for optimality -variations in transportation problem - maximization transportation problem - sensitivity analysis in transportation problems.

**Unit III**      Assignment Problem      10 h

Introduction - mathematical model of assignment problem- solution methods of assignment problem-assignment algorithm - special variations in the assignment problems.

**Unit IV**      Theory of Games      9 h

Introduction - Basic terminology: payoff - Strategy - Two-person zero-sum game - maximin principle - minimax principle - characteristics - solution methods of pure strategy games - Principle of dominance - solution methods of mixed strategy games

**Unit V**      Project Network Analysis      9 h

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

**Note:** (20% theory and 80% problems)



## Text Book

- 1 Kapoor.V.K. 2013, Operations Research- Quantitative Techniques for Management , Sultan Chand & Sons , New Delhi

## References

- 1 KandiSwarup, Gupta.P.K, Man Mohan. 2018. "Operations Research", 19th Edition, Sultan Chand & Sons , New Delhi
- 2 Panneerselvam. R, 2009, "Operations Research", 2nd Edition, PHI Learning Private Limited , New Delhi
- 3 Taha, H.A. 2006. Operations Research: An Introduction. 5th Edition. Prentice Hall of India Private Limited ,New Delhi
- 4 Man Mohan, Gupta. P.K, 2004. "Problems in Operations Research", 14th Edition, Sultan Chand & Sons, New Delhi.



Course Code	Course Name	Category	L	T	P	Credit
204CG1A3SA	PROGRAMMING IN PYTHON	SEC	3	-	-	3

### PREAMBLE

This course has been designed for students to learn and understand

- Familiar to learn the basic concepts in python
- Enhance adequate programming skills
- Visualize data set using python and SQLite

### 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 python programming	K1
CO2	Understand the expressions and control statements	K2
CO3	Apply the knowledge of tuples, lists and dictionaries	K3
CO4	Build programs using string functions and file methods	K2
CO5	Expose the concept in error handling and database design.	K2

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	S	M
CO2	S	M	S	M	S
CO3	S	S	S	M	S
CO4	M	L	S	S	M
CO5	M	S	M	S	M

**S Strong**

**M Medium**

**L Low**



204CG1A3SA	PROGRAMMING IN PYTHON	SEMESTER III
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**Total Credits: 3**

**Total Instruction Hours: 36 h**

### Syllabus

#### **Unit I** Python Introduction 8 h

Introduction: Features of Python – Execution of a Python program – Memory management in Python. Python Fundamentals: Structure of a python program – Tokens – Identifiers – Keywords – Literals – Variables – Data type in Python. Expressions and Operators: Statements – Expressions – Operators. Control Statements: Decision control statements – Looping statements – Jump statements.

#### **Unit II** Functions and List Processing 7 h

Functions: Difference between functions and methods – Classification of functions – Components of user-defined functions – Categories of functions – Passing Arguments to a function – Scope of a variable – Recursion – Anonymous or lambda function. List Processing: Advantages – Difference between a list and an array – Creating a list – Accessing list elements – Operations – Functions – Methods – Sorting the list – Nesting of a list – List comprehension.

#### **Unit III** Tuple, Dictionary and String Processing 7 h

Tuple Processing: Advantages – Difference between a tuple and list – Creating a tuple – Accessing tuple elements – Tuple operations – Function of a tuple – Nesting of tuple. Dictionary Processing: Advantages – Creating a dictionary – Accessing dictionary elements – Operations – Functions – Methods. String Processing: Creating a string – Accessing a string – String operations – Methods – Formatting strings.

#### **Unit IV** File Processing and Exception Handling 7 h

File Processing: Types of files – Closing a file – Writing data to the file – File built-in methods – Knowing if a file exists or not. Exception Handling: Types of errors – Introduction to exception – Types of exception – Exception handling – Structure of exception handling – User defined exception.



**Unit V** OOPs and Database Design

7 h

Object-Oriented Programming: Basic concepts of OOPs – Class specification – Inheritance and Polymorphism. Database Design in Python: Types of Database used in Python - Introduction to the SQLite Manager – Features of the SQLite Manager – Database programming connecting the SQLite Manager. Case Study: Data Visualization using Matplot lib package.

**Text Book**

- 1 RydhmBerl, (2019), Python made simple : Learn Python programming in easy steps with examples, BPB publications

**References**

- 1 Ashok N Kamthane, (2018), Programming & Problem Solving with Python, 1<sup>st</sup> Edition, TMH
- 2 Mark Summerfield, (2018), Programming in Python 3: A Complete Introduction to the Python Language, 2nd Edition, Pearson
- 3 E.Balagurusamy, (2017), Problem Solving and Python Programming, 1st Edition, TMH



204CG1A3SP	SEC PRACTICAL I - PYTHON PROGRAMMING	SEMESTER III
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Total Credits: 2  
Total Instructions Hours: 48 h

**S.No****List of Experiments**

- 1 Create a python program to perform any 5 built-in functions within it.
- 2 Write a python program to display a list of data items in a reverse order using control & looping statements.
- 3 Develop a Recurring Deposit calculator for a bank or post office using python.
- 4 Create a User-defined function using python.
- 5 Write a program to print “beep” if an integer appears ODDth time else print “no beep”.
- 6 Build a python program to perform list operations.
- 7 Write a Python program to perform tuple & dictionary operations.
- 8 Create a python program to perform string manipulation functions.  
  
Write a program to compute the monthly pay of 1000 employees using each employee name, basic pay and number of days gone on leave.
- 9 Calculate DA in that is computed as 20% of basic pay. The numbers of days gone on leave exceeding 10 are considered earned leave and salary for that period is deducted from salary (Basic pay + DA). Print the name and the salary list in the “salary.txt” file.
- 10 Implement the exception handling mechanism to handle the errors.
- 11 Create individual class and inherit their properties & methods by passing its values.
- 12 Demonstrate how to connect Student Database with SQLite and perform data storage and retrieval functions.

**Note:** Out of 12 - 10 Mandatory





<b>204CG1A3GA</b>	<b>GE - I : COMPUTING &amp; INTERNET TECHNOLOGY</b>	<b>SEMESTER III</b>
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**Total Credits: 2**

**Total Instructions Hours: 24**

### **Syllabus**

#### **Unit I      Computing Basics      4h**

Computer Basics: Introduction to Information Systems – Identifying Computer Types – Software Types: BIOS – Operating Systems – Utilities – Application Software. Computer System Components: Data representation – Input Devices – Processing Devices – Output Devices – Storage Devices. Computers Communication: Ethernet Networking – Bluetooth Networking – The Internet.

#### **Unit II      The System Unit      5h**

Overview of Central Processing Unit (CPU): Physical Components of a CPU – CPU Performance Factors. Memory: Computers Memory – System Memory. Motherboards: Expansion Slots – Built-in Components – Other Common External Connectors – Driver Connectors. Power Supplies.

#### **Unit III      Input, Output and Storage      5h**

Input Devices: Keyboards – Pointing Devices – Drawing Tablets – Scanning Devices – Capture Devices – Audio Input Devices. Output Devices: Display Screens. Printers: Features – Inkjet – Laser – Specialty Printers. Audio Output Devices. Storage Devices: Data Storage Basics – Hard Disk Drives – Optical Drives – Solid-State Drives – Network Volumes – Cloud-Based Storage.

#### **Unit IV      The Internet      5h**

Introduction to Internet – Definition – Evolution and History of Internet – Growth of Internet – Owners of Internet – Internet Services – Internet Works – Anatomy of Internet – Internet Addressing – Internet Vs Intranet. Internet Connectivity: Getting Connected – Different Types of Connections – Levels of Internet Connectivity – Internet Service Provider.

#### **Unit V      Internet Terminologies      5h**

Current Trends on Internet – World Wide Web (WWW) and Web Browser: WWW – Evolution of Web – Basic Elements of WWW – Web Browsers – Search Engines. E-Mail: Basics – E-Mail System – E-Mail Protocols – E-Mail Addresses – Structure of an E-Mail Message – E-Mail Security.



## Text Books

- 1     FaitheWempen, Rosie   Hattersley, Richard   Millett,   Kate   Shoup,   (2015),  
      Computing Fundamentals: Introduction to Computers, Wiley.
- 2     Internet Technology and Web Design, (2011), ISRD group, TMH.

## References

- 1     Ashok Arora, (2015), Computer Fundamental and Applications, Vikas Publishing.
- 2     Alexis Leon & Mathews Leon, (2012) Internet for Everyone, 2nd Edition, Vikas Publishing.
- 3     Dinesh Maidasani, (2012), Learning Computer Fundamentals, MS Office and Internet & Web Technology, Laxmi Publications.



<b>204CG1ASSA</b>	<b>COGNITIVE SKILLS FOR IT</b>	<b>SEMESTER III</b>
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**Total Credit: 1**

### **Syllabus**

#### **Unit I Introduction to Cognition**

Introduction – Meaning Cognitive Processes. Development of Cognitive Psychology: Structuralism – Functionalism – Behaviourism – Memory Research – Gestalt Psychology – Emergence of Cognitive Psychology – Information Processing – Connectionism – Alternate Approaches to Cognitive Psychology – Research Methods in Cognitive Psychology.

#### **Unit II Perceptual Processes**

Object Recognition – Theories of Object Recognition – Bottom-Up and Top-Down Processing – Face Perception. Change Blindness Attention: Divided Attention – Selective Attention – Visual Attention and Auditory Attention. Consciousness: Varieties – Subliminal Perception. Visual Perception – Perceptual Organizational Processes – Multisensory Interaction and Integration – Synesthesia – Comparing the Senses – Perception and Action.

#### **Unit III Memory**

Working Memory: Research on Working Memory – Factors Affecting the Capacity of Working Memory – Baddeley's Working Memory Approach. Long Term Memory: Encoding & Retrieval in Long Term Memory – Autobiographical Memory. Memory Strategies: Practice – Mnemonics using Imagery – Mnemonics using Organization – The Multimodal Approach – Improving Prospective Memory. Meta-cognition: Meta-memory – TOT – Meta-comprehension.

#### **Unit IV Problem Solving, Reasoning & Decision Making**

VUCA World Problem Solving – Types of Problem – Understanding the Problem – Problem-Solving Approaches – Factors that Influence Problem Solving – Creativity – Reasoning – Inductive and Deductive Reasoning Decision Making – Heuristics in Decision Making – Representativeness – Availability and Anchoring and Adjustment – The Framing Effect – Overconfidence in Decisions – The Hindsight Bias.



## Unit V      Future Skills

Critical thinking – Adaptive thinking – Cognitive Load Management – Design Thinking – Virtual Collaboration and Cultural Sensitivity. Case Study: Social Cognition and Artificial Intelligence.

### Text Book

- 1     Matlin M.W., (2019), Cognition, 10th Edition, Wiley

### References

- 1     Riegler, B.R., Reigler, G.L., (2018), Cognitive Psychology – Applying the Science of Mind. 4th Edition, Pearson.
- 2     E. Bruce Goldstein, (2018), Cognitive Psychology: Connecting Mind, Research, and Everyday Experience, 5<sup>th</sup> Edition, Wadsworth.
- 3     Benjafield J G, (2010). Cognition, 4th Edition, Oxford University.



<b>204CG1ASSB</b>	<b>WEB TECHNOLOGY</b>	<b>SEMESTER III</b>
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**Total Credit: 1**

### **Syllabus**

#### **Unit I Structuring Documents for the Web**

Introduction: HTML and XHTML - Basic Text Formatting - Presentational Elements - Phrase Elements - Lists - Editing Text - Core Elements and Attributes - Attribute Groups. Links and Navigation: Basic Links - Creating Links with the <a> Element - Advanced E-mail Links - Images. Audio and Video: Adding Images Using the <img> Element - Using Images as Links Image Maps - Choosing the Right Image Format - Adding Flash - Video and Audio to your web pages.

#### **Unit II Basic Elements of HTML**

Tables: Introducing Tables - Grouping Section of a Table - Nested Tables - Accessing Tables. Forms: Introducing Forms - Form Controls - Sending Form Data to the Server. Frames: Introducing Frameset - <frame> Element - Creating Links Between Frames - Setting a Default Target Frame Using <base> Element - Nested Framesets - Inline or Floating Frames with <iframe>.

#### **Unit III HTML Advances**

Cascading Style Sheets: Introducing CSS - Where you can Add CSS Rules. CSS Properties: Controlling Text, Text Formatting - Text Pseudo Classes - Selectors - Lengths - Introducing the Box Model. More Cascading Style Sheets: Links - Lists - Tables - Outlines - The focus and activate Pseudo classes Generated Content - Miscellaneous Properties - Additional Rules - Positioning and Layout-Page Layout CSS - Design Issues.

#### **Unit IV Client Side Scripting**

Java Script: How to Add Script to Your Pages - Variables and Data Types - Statements and Operators - Control Structures - Conditional Statements - Loop Statements - Functions - Message box - Dialog Boxes - Alert Boxes - Confirm Boxes - Prompt Boxes.



## Unit V      JavaScript Objects

Working with JavaScript: Practical Tips for Writing Scripts. JavaScript Objects: Window Object – Document object – Browser Object – Form Object – Navigator object Screen object – Events – Event Handlers – Forms – Validations – Form Enhancements – JavaScript Libraries.

### Text Book

- 1    Jon Duckett, (2011), Beginning HTML, XHTML, CSS and Java Script, Wiley.

### References

- 1    M. Srinivasan, (2012), Web Technology: Theory and Practice, 1st Edn,, Pearson
- 2    Chris Bates, (2010), Web Programming: Building Internet Applications, 3rd Edn., Wiley.



191TLIA3AA	பகுதி - 4 : அடிப்படைத்தமிழ்தாள் : 1(Basic Tamil )	SEMESTER III
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Total Credits: 2

Total Instruction Hours: 24 h

இளங்கலை 2019-20ஆம் கல்வியாண்டு முதல் சேர்வோர்க்குரியது (10 மற்றும் 12 - ஆம் வகுப்பு வரை தமிழ் மொழிப்பாடம் பயிலாதவர்களுக்கு) (பருவத் தேர்வு உண்டு )

அலகு : 1 தமிழ் மொழியின் அடிப்படைக் கூறுகள் 12 h

அ) எழுத்துகள் அறிமுகம் :

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

ஆ) சொற்களின் அறிமுகம்: பெயர்ச்சொல், வினைச்சொல் - விளக்கம் (எ.கா.)

அலகு : 2 குறிப்பு எழுதுதல் 12 h

1. பெயர், முகவரி, பாடப்பிரிவு , கல்லூரியின் முகவரி
2. தமிழ் மாதங்கள்(12), வாரநாட்கள்(7),
3. எண்கள் (ஒன்று முதல் பத்து வரை), வடிவங்கள், வண்ணங்கள்
4. ஊர்வன, பறப்பன, விலங்குகள், மனிதர்களின் உறவுப்பெயர்கள்
5. ஊர்களின்பெயர்கள் (எண்ணிக்கை 10)
6. பயிற்சிப் பகுதி (உரையாடும் இடங்கள்) : வகுப்பறை, பேருந்து நிலையம், சந்தை

வினாத்தாள் அமைப்பு முறை - மொத்த மதிப்பெண்கள் - 100

பகுதி -அ

சரியான விடையைத் தேர்வு செய்தல் 10x2=20

பகுதி -ஆ

சரியா? தவறா? தேர்ந்தெடுத்து எழுதுக . 10x2=20

பகுதி-இ

ஒரு பக்க அளவில் விடையளிக்க 03x20=60

குறிப்பு:

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



### Text Books

- 1 அடிப்படைத் தமிழ். 2019. தொகுப்பு : தமிழ்த் துறை, டாக்டர் என். ஜி.பி. கலை மற்றும் அறிவியல் கல்லூரி, நியூ செஞ்சுரி புக் ஹவுஸ்(பி)லிட். சென்னை

### References

- 1 ஒன்றாம் வகுப்பு பாடநூல் - தமிழ்நாடு அரசு பாடநூல் கழகம்
- 2 வலைதள முகவரி : <http://tamilvu.org>





191TLIA3AB	பகுதி - 4 : சிறப்புத் தமிழ் தாள் : 1 (Advanced Tamil )	SEMESTER - III
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Total Credits: 2

Total Instruction Hours: 24 h

இளங்கலை 2019- 2020 ஆம் கல்வியாண்டு முதல் சேர்வோர்க்குரியது (10 மற்றும் 12 - ஆம் வகுப்புகளில் தமிழ் மொழிப்பாடம் பயின்றவர்களுக்கு உரியது)(பருவத் தேர்வு உண்டு )

அலகு - 1 மரபுக் கவிதைகள் 05 h

அ) பாரதியார் கவிதைகள்

- தமிழ்நாடு
- மனதில் உறுதி வேண்டும்
- வருகின்ற பாரதம் (பா.எண்.5-8)

ஆ) பாரதிதாசன் கவிதைகள்

- இன்பத்தமிழ்
- நீங்களே சொல்லுங்கள்
- வாளினை எட்டா!

இ) தாராபாரதி கவிதைகள்

- வேலைகளல்ல வேள்விகள்

அலகு - 2 புதுக்கவிதைகள் 05 h

- கம்பன் கவியரங்கக் கவிதை - மு.மேத்தா
- தமிழா! நீ பேசுவது தமிழா! - காசியானந்தன்
- நட்புக் காலம் (10 கவிதைகள்) - அறிவுமதி கவிதைகள்

அலகு - 3 இலக்கணம் 04 h

- வல்லினம் மிகும் மற்றும் மிகா இடங்கள்
- ர, ற, - ல, ழ, ள - ந, ண, ன - ஒலிப்பு நெறி, பொருள் வேறுபாடு அறிதல்

அலகு - 4 கடிதங்கள் எழுதுதல் 05 h

- பாராட்டுக் கடிதம்
- நன்றிக் கடிதம்
- அழைப்புக் கடிதம்
- அலுவலக விண்ணப்பங்கள்

அலகு - 5 பாடம் தழுவிய வரலாறு 05 h

- பாரதியாரின் இலக்கியப் பணி
- பாரதிதாசனின் இலக்கியப்பணி
- மரபுக்கவிதை, புதுக்கவிதை - விளக்கம்



Dr.NGPASC

COIMBATORE | INDIA

B.Sc. Computer Science with Cognitive Systems (Students admitted during the AY 2020-21)

வினாத்தாள் அமைப்பு முறை -

மொத்த மதிப்பெண்கள் - 100

சரியான விடையைத் தேர்வு செய்தல்	பகுதி -அ	10x2=20
கோடிட்ட இடங்களை நிரப்புக.	பகுதி -ஆ	10x2=20
இரண்டு பக்க அளவில் விடையளிக்க	பகுதி -இ	4x15=60

குறிப்பு:

- பகுதி -அ அனைத்து அலகுகளில் இருந்தும் இரண்டு வினாக்கள் அமைதல் வேண்டும்
- பகுதி இ -க்கான வினாக்கள் இது அல்லது அது என்ற அடிப்படையில் அந்தந்த அலகுகளில் அமைதல் வேண்டும்

#### Text Books

- 1 சிறப்புத் தமிழ் . 2019. தொகுப்பு: தமிழ்த் துறை, டாக்டர் என். ஜி.பி. கலை மற்றும் அறிவியல் கல்லூரி, நியூ செஞ்சுரி புக் ஹவுஸ்(பி)லிட். சென்னை

#### References

- 1 புலவர் சோம. இளவரசு - 2014. இலக்கிய வரலாறு, மணிவாசகர் பதிப்பகம், சென்னை - 108
- 2 வலைதள முகவரி : <http://tamilvu.org>



<b>195CR1A3AA</b>	<b>WOMEN'S RIGHTS</b>	<b>SEMESTER III</b>
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**Total Credits: 2**

**Total Instruction Hours: 24h**

### **Syllabus**

#### **Unit I Rights to Infant & Child 4 h**

Issues for women in India- Law relating to Female infanticide-Rights to the survival of a child-Child Labour- Child trafficking –Child Marriage- Protection of Children against Sexual Offences Act 2012 (POCSO)

#### **Unit II Rights to women 5 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

#### **Unit III Laws for Senior Citizen women 5 h**

Constitutional Rights –Personal Laws- The Tamil Nadu Maintenance and Welfare of Parents and Senior Citizens Rules in 2009- The National Council for Older person- Government Provisions for elderly persons

#### **Unit IV Civil and Political Rights of Women 5 h**

Right of inheritance-Right to live with decency and dignity-The Married women's Property Act 1874-Personal law 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

#### **Unit V International convention on Womens' Right 5 h**

Convention on the Elimination of All Forms of Discrimination against Women(CEDAW)-United Nations population Fund(UNFPA)-Protocol to the African Charter on the rights of women in Africa-Convention on the Nationality of Married women-Convention on the political rights of women- Inter-American convention on granting of civil and political rights for women-Universal declaration of Human rights



## Text Books

- 1 Women & Law(2009)-Krishna Pal Malik-Allahabad Law University, Delhi

## References

- 1 Women's Human Rights in India(2019)-Christian Foster and Jaya Sagade- Routledge India  
Justice for Women: Concerns and Expressions (2008)-Anand AS –Universal Law
- 2 Publishing Co.



Course Code	Course Name	Category	L	T	P	Credit
191TL1A4TA	பகுதி-1: தமிழ் - தாள்- IV	மொழி	3	1	-	3

### PREAMBLE

This course has been designed for students to learn and understand

- மொழிப்பாடங்களின் வாயிலாகத் தமிழரின் பண்பாடு , 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) – மாணவனின் செயலாக்கத்திறனை ஊக்குவித்தல்	K1,K2 & K3
CO2	மதிப்புக்கல்வி (Attitude and Value education)	K2,K4
CO3	பாட இணைச்செயல்பாடுகள் (Co-curricular activities)	K2,K3 & K4
CO4	சூழலியல் ஆக்கம் (Ecology)	K4
CO5	மொழி அறிவு (Tamil knowledge)	K5

### MAPPING WITH PROGRAMME OUTCOMES

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

**S Strong**

**M Medium**

**L Low**



191TLIA4TA	பகுதி-1: தமிழ் - தாள்- IV	SEMESTER IV
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Total Credits: 3

Total Instruction Hours: 48 h

## Syllabus

## Unit I எட்டுத்தொகை

10 h

1. இலக்கிய வரலாறு - எட்டுத்தொகை நூல்கள்
2. 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 : 9 – பெருங்கடுங்கோ
2. அகநானூறு – மருதத்திணை
  - I.பா.எண் : 86 – நல்லாழர்கிழார்
- குறிஞ்சித் திணை
  - I.பா.எண் : 198 – பரணர்
2. 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. இலக்கிய வரலாறு - பத்துப்பாட்டு நூல்கள்
2. பட்டினப் பாலை - கடியலூர் உருத்திரங் கண்ணனார்

**Unit IV புதினம்**

10 h

1. புதினத்தின் தோற்றமும் வளர்ச்சியும்
2. புதினம்
  1. புத்துமண் - சுப்ரபாரதிமணியன்

**Unit V இலக்கணம் மற்றும் திறனாய்வுப் பகுதி**

10 h

**I. இலக்கணம்**

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

**II. பயிற்சிப் பகுதி**

புதினத் திறனாய்வு - கொங்கு வட்டாரப் புதினங்கள்

1. நாகம்மாள் - ஆர். சண்முகசுந்தரம்
2. மானாவாரி மனிதர்கள் - சூர்யகாந்தன்
3. ஈரம் கசிந்த நிலம் - சி. ஆர். ரவீந்திரன்
4. ஒண்டிக்காரன் பண்ணையம் - மா. நடராசன்

**Note:** பயிற்சிப் பகுதியில் வினாக்கள் அமைத்தல் கூடாது

**Text Books**

செய்யுள் திரட்டு - மொழிப் பாடம் - 2020- 21

- 1 தொகுப்பு: தமிழ்த்துறை, டாக்டர் என்.ஜி.பி. கலை அறிவியல் கல்லூரி, வெளியீடு : நியூ செஞ்சுரி புக் ஹவுஸ், சென்னை - 600 098.
- 2 சுப்ரபாரதிமணியன், முதற் பதிப்பு -2019, புத்துமண் புதினம் - நியூ செஞ்சுரி புக் ஹவுஸ், சென்னை - 600 098. (Unit-IV)

**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 தமிழ் இணையக் கல்விக்கழகம். <http://www.tamilvu.org/>



Course Code	Course Name	Category	L	T	P	Credit
191TL1A4HA	Part- I : HINDI - Paper-IV	Language	3	1	-	3

### PREAMBLE

This course has been designed for students to learn and understand

- To develop the writing ability and develop reading skill.
- To learn various concepts and techniques for criticizing literature, to learn 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	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

**S Strong**

**M Medium**

**L Low**





191TL1A4HA	Part- I : HINDI - Paper-IV	SEMESTER IV
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Total Credits: 03

Total Instruction Hours: 48 h

## Syllabus

### Unit I 10 h

नाटक – लडाई – सर्वेश्वरदयाल सक्सेना

प्रकाशक: वाणी प्रकाशन

21-A, दरियागंज

नई दिल्ली-110002

### Unit II 10 h

एकांकी: एकांकी पंचामृत – डॉ राम कुमार

(भोर और तारा छोड़कर)

प्रकाशक: जवाहर पुस्तकालय

सदर बाजार, मथुरा

उत्तर प्रदेश-281001

### Unit III 10 h

काव्य मंजरी- (डा मुन्ना तिवारी)

मैथिलीशरण गुप्त- मनुष्यता, जयशंकर प्रसाद- बीती विभावरी जागरी

सूर्यकान्त त्रिपाठी निराला- तोडती पत्थर और भिक्षुक

### Unit IV 10 h

सूचना लेखन

पुस्तक: व्याकरण प्रदिप – रामदेव

प्रकाशक: हिन्दी भवन 36 इलाहाबाद-211024

### Unit V 08 h

अनुवाद अभ्यास-III (केवल अंग्रेजी से हिन्दी में)

(पाठ 10 to 20)

प्रकाशक: दक्षिण भारत प्रचार सभा चेन्नई -17



Course Code	Course Name	Category	L	T	P	Credit
191TL1A4MA	Part- I : MALAYALAM - Paper-IV	Language	3	1	-	3

### PREAMBLE

This course has been designed for students to learn and understand

- To develop the writing ability and develop reading skill.
- To learn various concepts and techniques for criticizing literature, to learn 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	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

**S Strong**

**M Medium**

**L Low**



191TL1A4MA	Part- I : MALAYALAM - Paper-IV	SEMESTER IV
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**Total Credits:** 3

**Total Instruction Hours:** 48 h

### Syllabus

<b>Unit I</b>	10 h
Drama	
<b>Unit II</b>	10 h
Drama	
<b>Unit III</b>	10 h
Drama	
<b>Unit IV</b>	10 h
Screen Play	
<b>Unit V</b>	08 h
Screen Play	

### Text Books

- 1 Manju Poloru Penkutti, Screen Play By Kalavoor Ravikumar, Published by DC.Books, Kannur.
- 2 Lankalakshmi, Drama By C.N.Sreekandan Nair Published by D C.Books Kottayam



Course Code	Course Name	Category	L	T	P	Credit
201TL1A4FA	FRENCH -IV	LANGUAGE- 1	3	1	-	3

### PREAMBLE

This course has been designed for students to learn and understand

- 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.
- 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	Learn the adjectives and the classroom environment in France.	K2
CO3	Learn the Plural, Articles and the Hobbies.	K3
CO4	Learn the Cultural Activity in France.	K3
CO5	Learn 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	S	M	M	M	S
CO2	S	M	M	M	S
CO3	S	M	S	M	S
CO4	S	M	S	M	S
CO5	S	M	S	M	S

**S Strong**

**M Medium**

**L Low**



201TL1A4FA	FRENCH - IV	SEMESTER IV
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Total Credits: 3

Total Instruction Hours: 48 h

## Syllabus

## Unit I Trèsd rôle I, Page 10

10 h

* Exprimer sa certitude et son incertitude. * Exprimer son approbation et son indifférence.	Ecrire un courriel à un journal pour prendre position sur l'application d'un e-mail.	* Comprendre un reportage radiophonique. * Interviewer un personnage public. * Raconter une expérience personnelle
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## Unit II Vous avez dit Culture ?, Page 20

8 h

* Exprimer et demander un point de vue. * Exprimer son intention de faire quelque chose (1).	Monter une animation dans son centre de langue pour promouvoir la culture française.	* Comprendre une conversation entre plusieurs personnes. * Donner son point de vue. * Créer dialogues sur des thèmes donnés.
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## Unit III Envie d'ailleurs, Page 30

10 h

* Justifier un choix. * Exprimer son intention de faire quelque chose (2). * Exprimer la restriction.	Monter un projet d'échanges avec un centre de langue francophone.	* Comprendre une interview. * Expliquer ses choix. * Expliquer ses intentions d'actions face à une situation. * Présenter un projet.
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## Unit IV Voilà l'été !, Page 40

10 h

* Exprimer le fait d'aimer, de préférer. * Comparer.	Préparer un programme de séjour linguistique.	* Comprendre un bulletin d'information radiophonique.
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## Unit V Voilà l'été !, Page 40

10 h

* Exprimer ses joies et sa tristesse. Dr. NGPASC COIMBATORE   INDIA	Préparer un programme de séjour linguistique B.Sc. Computer Science with Cognitive Systems (Students admitted during the AY 2020-21)	* Comprendre des témoignages. * Exprimer ses sentiments à partir d'une situation illustrée.
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## Text Book

- 1 Reference Book : LATITUDES 2, Méthode de français By – Régine Emmanuel  
laine, Yves Loiseau, Pages : 9 - 55



Course Code	Course Name	Category	L	T	P	Credit
191EL1A4EA	ENGLISH- IV	LANGUAGE	4	-	-	3

### PREAMBLE

This course has been designed for students to learn and understand

- The basics of English grammar and specific usages
- 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	Learn English grammar and its specific usage	K2
CO2	Know the ways of improving English language vocabulary	K3
CO3	Understand the importance of English language in competitive exams	K3
CO4	Acquire the basic needs of communication skills and methods	K3
CO5	Comprehend the composition writing and similar skills	K4

### MAPPING WITH PROGRAMME OUTCOMES

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

**S Strong**

**M Medium**

**L Low**



<b>191EL1A4EA</b>	<b>ENGLISH- IV</b>	<b>SEMESTER IV</b>
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**Total Credits: 3**

**Total Instruction Hours: 48 h**

### **Syllabus**

**Unit I**      Grammar 10 h

The use of correlatives - The perfect tense - appended questions - the infinitive - negative verbs - redundant conjunctions - use of make and do - fairly and rather

**Unit II**      Vocabulary 10 h

Words and contextual uses - Synonyms - Antonyms - Add one out - inflectional - infix- telescoping - loanwords - British and American words - Thesaurus

**Unit III**      Language Use 08 h

Spotting Errors - Words often confused - Reconstructing a Passage - Clause - Idioms and colloquialism - Language aptitude - Clipping

**Unit IV**      Communication 11 h

Different Types of Asking - Oral rehearsal - Describing person, Diagram, Data, Table - Vote of thanks - Small talk - Refusal and Apology

**Unit V**      Composition 09 h

General Essay writing - Mind map - Reviews - Title expansion - Creative writing - Content writing - Translation - Abstracting - Flash Fiction





## Text Books

- 1 Wood F.T. 2010. A Remedial Grammar for Foreign Students. Macmillan Publishers, India. [Unit I and II]
- 2 Bhatnagar R.P. 2013. English for Competitive Examinations. 3rd Edition. Trinity Press, New Delhi. [Unit III, IV and V]

## References

- 1 Radhakrishna Pillai G. 2000. English for Success. Emerald Publishers, Chennai.
- 2 Krishnaswamy N. 2000. Modern English a Book of Grammar Usage and Composition. Macmillan Publishers, India.
- 3 Arulselvi Evangelin. 2012. Teaching of Special English. Saratha Pathippagam, Chennai.
- 4 Rawdon Wyatt. 2008. Check Your Vocabulary for TOFEL. Macmillan Publishers, India.



Course Code	Course Name	Category	L	T	P	Credit
204CG1A4CA	RELATIONAL DATA BASE MANAGEMENT SYSTEMS	CORE	3	0	0	3

### PREAMBLE

This course has been designed for students to learn and understand

- The basics of DBMS.
- The relational data model.
- Utilize the DBMS in various real-time applications.

### 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 various database systems.	K1
CO2	Demonstrate the basics of SQL commands	K2
CO3	Execute various advanced SQL queries.	K3
CO4	Apply various normalization techniques on databases.	K3
CO5	Apply and relate the concept of Transaction, Concurrency control and Recovery in database system.	K3

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	M	M
CO2	S	S	S	M	M
CO3	M	L	S	M	M
CO4	M	S	S	S	L
CO5	M	S	S	S	M

**S Strong**

**M Medium**

**L Low**



<b>204CG1A4CA</b>	<b>RELATIONAL DATABASE MANAGEMENT SYSTEMS</b>	<b>SEMESTER IV</b>
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**Total Credits: 3**

**Total Instruction Hours: 36 h**

### **Syllabus**

#### **Unit I Introduction 8 h**

Database System Applications - DBMS Vs. File System - View of Data - Data Model Database Languages - Database users and Administrators - Transaction Management - Database System Structure - Application Architecture. Data Models: Basic Concepts - Constraint - Keys - ER Diagram - Relational Model: Structure of Relational Databases - Relational Algebra.

#### **Unit II SQL 7 h**

Background - Basic Structure - Set Operation - Aggregate Function - Null Values - Nested Sub Queries - Views - Modification of the Database - Database Languages: Data Definition Languages - Data Manipulation Languages - Data Control Languages - Transaction Control Languages - Embedded SQL - Dynamic SQL.

#### **Unit III Advanced SQL 7 h**

Integrity and Security: Introduction - Domain Integrity - Constraint - Referential Integrity - assertions - Triggers - creation of triggers - Views - View creation - Security and Authorization - Authorization in SQL - Encryption and Authentication - Database Encryption Techniques.

#### **Unit IV Relational Database Design 7 h**

Introduction - Pitfalls in Relational Database Design-Functional Dependencies - First Normal Form - Second Normal Form - Boyce - Codd Normal Form - Third Normal Form - Fourth Normal Form - Overall Database Design Process.

#### **Unit V Transaction Management 7 h**

Transaction concepts - States - Serializability - Lock based concurrency control: Locks - Granting - Two-Phase Locking protocol. Time stamp based protocol: Timestamps - Timestamp ordering protocol - Dead lock handling.



## Text Books

- 1 A Silberschatz, H Korth, S Sudarshan, (2011), "Database System and Concepts", (6th Edn.)TMH.

## References

- 1 Alexix Leon & Mathews Leon, (2014), "Fundamentals of DBMS", (2nd Edn.), Vijay Nicole Publications.
- 2 Alexix Leon & Mathews Leon, (2009), "Essential of DBMS", (2nd Edn.), Vijay Nicole Publications.



204CG1A4CP	CORE PRACTICAL: PL/SQL	SEMESTER- IV
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**Total Credits: 2**

**Total Instructions Hours: 48h**

S.No	List of Experiments
1	Draw E-R diagram and convert entities and relationships to relation table for a given scenario of bank and college.
2	To implement the DDL Commands.
3	Implement DDL Commands with Key Constraints.
4	To Implement the DML Commands.
5	Implement DCL Commands and Views.
6	Write a PL/SQL program to check whether a number is even or odd.
7	Design a PL/SQL block of code for reversing a number.
8	Design a PL/SQL block to compute the incentive of an employee whose ID is 110.
9	Write a PL/SQL program to check whether a given number is positive, negative or zero.
10	Write a PL/SQL program using FOR loop to insert ten rows into a database table.
11	Write a PL/SQL program to check whether a given character is letter or digit.
12	Write a PL/SQL code to compute the area of the circle. The radius value varying from 3 to 7. Store the radius and its corresponding values in a table.

**Note:** Out of 12 - 10 Mandatory



Course Code	Course Name	Category	L	T	P	Credit
205CI1A4IA	DIGITAL MARKETING	IDC	4	-	-	4

### PREAMBLE

This course has been designed for students to learn and understand

- The strategy and plan of digital marketing
- The concepts of Search engine optimization and Web analytics
- The case shell of various advertisements

### COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the digital marketing strategy and the advertising tools.	K1
CO2	Know about the Search engine advertising and the account monitoring	K2
CO3	Recognize the Social media marketing techniques with social medias monitoring tools.	K3
CO4	Acquire the knowledge on the Search Engine Optimization and the Web analytics.	K3
CO5	Know the case shell of various digital marketing applications and advertisements.	K2

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	M	M	S	M
CO2	S	M	S	M	S
CO3	S	S	M	S	M
CO4	M	M	M	S	L
CO5	S	M	S	S	M

**S Strong**

**M Medium**

**L Low**



<b>205CI1A4IA</b>	<b>DIGITAL MARKETING</b>	<b>SEMESTER IV</b>
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**Total Credits: 4**

**Total Instruction Hours: 48 h**

### **Syllabus**

#### **Unit I** Introduction to Digital Marketing 8 h

Digital Marketing- internet users- Digital Marketing strategy- Digital Advertising Market in India- Skills required in Digital Marketing- Digital Marketing Plan, Display Advertising- concept- types of display Advertisement- models- Plan-Targeting- Good Ad - programmatic Digital Advertising - Analytic tools- YouTube Advertising.

#### **Unit II** Search Engine Advertising 10 h

Search Engine and Advertising - Analytics - Competition - Understanding Ad Placement- Ad Ranks - Basic Ad Auction Model - Important of AdRank - Search Advertising Account - Architecture - Creating Effective Ads - Ad Campaign - Enhancing Ad Campaign - Advanced Ad format - Account Monitoring - performance report - Segments - Search Terms - Auction Insights.

#### **Unit III** Social Media Marketing 10 h

Introduction - Social Media Strategy and Implementation - Face book Marketing - Facebook for business - Adverts - Facebook Insight - Design Tools - LinkedIn Marketing - LinkedIn Groups - LinkedIn Analytics - Twitter Marketing- Twitter in India - Twitter Ads - Twitter Analytics - Twitter Management and Monitoring Tools - Instagram and Snapchat Apps - Mobile Marketing.

#### **Unit IV** Search Engine Optimization 10 h

Introduction- Search Engine - concepts- On page and off page Phases-optimizations- Social Media reach- Maintenance.

Web Analytics: Introduction- Data collection- Key Metrics- making web- Analytic Aeconable - multi Channel Advertising- types of Tracking codes- Mobile Analytics- Universal Analytics- Competitive Intelligence.

#### **Unit V** Case Shell 10 h

Case Shell: Aisel Fashion Shoot- Kotak Securities- The Fall and Rise of Maggi- TATA DOCOMO- ICICI Bank- Merchenders- Benz- DELL- Barclays Business Banking SEO campaign- conversion Tracking through URL builder- A Hotel branch- UAV coach- Philips AirFryor- KanKhajura Station and H&M.



## Text Books

- 1 Seema Gupta , 2017, “Digital Marketing” , 1st Edition , McGraw-Hill.

## References

- 1 Deborah Ng ,Jan Zimmerman, “Social Media Marketing All-in-One For Dummies”, 4th Edition, John Wiley & Sons, Inc.
- 2 Aaron Matthew Wall, “ Search Engine Optimization”, (EBook), <http://www.seobook.com/seobook53.pdf>.
- 3 Eric Enge, Stephan Spencer and Jessie C.Stricchiola, 2015, "Mastering Search Engine Optimization" , 3rd Edition, O'Reilly Media Inc.





Course Code	Course Name	Category	L	T	P	Credit
204CG1A4SA	CLOUD AND VIRTUALIZATION	SEC	3	-	-	3

### PREAMBLE

This course has been designed for students to learn and understand

- Familiar to learn the basic concepts in Cloud Computing
- Enhance adequate knowledge in Cloud & its types
- Use of Virtualization & Datacenter in Cloud

### 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 Cloud Computing	K1
CO2	List the various service model of Cloud	K2
CO3	Apply the knowledge of Virtualization	K3
CO4	Understand the different hypervisors of Clouds for the Virtualization	K2
CO5	Enumerate the principles in datacenter design	K2

### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	M	S	M
CO2	S	M	S	M	S
CO3	S	S	S	M	S
CO4	M	L	S	S	M
CO5	M	S	M	S	M

**S Strong**

**M Medium**

**L Low**



<b>204CG1A4SA</b>	<b>CLOUD AND VIRTUALIZATION</b>	<b>SEMESTER IV</b>
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**Total Credits: 3**

**Total Instruction Hours: 36 h**

### **Syllabus**

**Unit I** Introduction to Cloud Computing **8 h**

Introduction: Definition of Cloud - Evolution of Cloud Computing - Types of Cloud: Public cloud - Private cloud - Community cloud - Hybrid cloud - Underlying principles of Parallel & Distributed Computing - Cloud Characteristics - Advantages of Cloud.

**Unit II** Cloud Concepts **7 h**

Three Service Models: Infrastructure as a Service (IaaS) - Platform as a Service (PaaS) - Software as a Service (SaaS) - Benefits of Cloud Computing - Pros and Cons of Cloud Computing - Cloud Vendors - Traditional Infrastructure Setup and Challenges - Amazon Web Service.

**Unit III** Virtualization **7 h**

Introduction to vSphere and the Software - Defined Data Center Creating Virtual Machines - VCenter Server - Configuring and Managing - Virtual Networks Configuring and Managing Virtual Storage - Virtual Machine Management - Resource Management and Monitoring.

**Unit IV** Hypervisor **7 h**

Virtual Machines: vSphere HA - vSphere Fault Tolerance - Protecting Data vSphere DRS - Network Scalability - vSphere Update Manager and Host Maintenance - Storage Scalability - Securing Virtual Machines.

**Unit V** Datacenter **7 h**

Data center overview - Components - Provisions - Need of Data Center - Data Center Architecture - Different Racks - Data Center Architecture for Cloud Computing - Role of Data center in Cloud Computing.



## Text Book

- 1 Surbhi Rastogi, (2021), Cloud Computing Simplified: Explore Application of Cloud, Cloud Deployment Models, Service Models and Mobile Cloud Computing, BPB.
- 2 Rittinghouse, John W., and James F. Ransome, (2017), Cloud Computing: Implementation, Management and Security, (2nd Edn.), CRC Press.

## References

- 1 George Coulouris, Jean Dollimore, Tim Kindberg, (2012), Distributed Systems Concepts and Design, 5th Edition, Pearson
- 2 Venkata Josyula, Malcolm Orr, Greg Page, (2011), Cloud Computing: Automating the Virtualized Data Center, 1st Edition, Cisco Press
- 3 Brian J.S. Chee, Curtis Franklin Jr., (2010), Cloud Computing: Technologies and Strategies of the Ubiquitous Data Center, 1st Edition, CRC Press



204CG1A4SP	SEC PRACTICAL - ADVANCED CLOUD	SEMESTER IV
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**Total Credits:** 2  
**Total Instructions Hours:** 48 h

S.No	List of Experiments
1	Create an class time table and stored it on the cloud with doc, and pdf format using docs.google.com
2	Create a resume in using standard template in google or zoho cloud
3	Develop a Google app engine program to generate n even numbers and deploy it to google cloud
4	Create an account in AWS and MS Azure
5	Install Virtual box / VMware Workstation on windows OS
6	Create a procedure to transfer the files from one virtual machine to another virtual machine
7	Study and implement Storage as a Service
8	Backup an local drive to OneDrive
9	Exploring AWS services for databases
10	Working with hypervisors
11	Implement the cloud services in Microsoft Azure
12	Develop a Guestbook Application using Google App Engine

**Note:** Out of 12 - 10 Mandatory



<b>204CG1A4GA</b>	<b>E-COMMERCE TECHNOLOGIES</b>	<b>SEMESTER IV</b>
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**Total Credits: 2**

**Total Instructions Hours: 24**

### **Syllabus**

#### **Unit I Introduction to E-Commerce 4h**

History of E-commerce and Indian Business Context: E-Commerce -Emergence of the Internet - Emergence of the WWW - Advantages of E-Commerce -Transition to E-Commerce in India - The Internet and India - E-transition Challenges for Indian Corporate.

#### **Unit II E-Business Models 5h**

Business Models for E-commerce: Business Model - E-business Models Based on the Relationship of Transaction Parties - E-business Models Based on the Relationship of Transaction Types.

#### **Unit III E-commerce Applications 5h**

Enabling Technologies of the World Wide Web: World Wide Web - Internet Client-Server Applications - Networks and Internets - Software Agents - Internet Standards and Specifications - ISP.E-Marketing : Traditional Marketing - Identifying Web Presence Goals - Online Marketing - E-advertising - Ebranding.

#### **Unit IV Internet Payment 5h**

E-Payment Systems: Main Concerns in Internet Banking - Digital Payment Requirements - Digital Token-based e-payment Systems - Classification of New Payment Systems - Properties of Electronic Cash - Cheque Payment Systems on the Internet.

#### **Unit V Mobile Commerce 5h**

Information systems for Mobile Commerce: Introduction - Wireless Applications - Cellular Network - Wireless Spectrum - Technologies for Mobile Commerce - Wireless Technologies.



## Text Books

- 1 P.T.Joseph, "E-Commerce - An Indian Perspective", 4th Edition, PHI Learning, 2012
- 2 C Xavier, "World Wide Web Design with HTML", 13th Reprint, Tata McGraw Hill, 2006

## References

- 1 David Whiteley, "E-Commerce Strategy, Technologies and Applications", 1st Edition, Tata Mc-Graw-Hill, 2001
- 2 Kamalesh K Bajaj and Debjani Nag, "E-Commerce - The cutting edge of Business", 2nd Edition, Tata McGraw-Hill Education, 2005
- 3 Alexis Leon and Mathews Leon, "Internet for Everyone", 15th Anniversary Edition, Leon Tech world, UBS Publications, 2012



191TL1A4AA	பகுதி - 4 : அடிப்படைத்தமிழ் - தாள் : II (Basic Tamil )	SEMESTER IV
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Total Credits: 2

Total Instruction Hours: 24 h

இளங்கலை 2019-20ஆம் கல்வியாண்டு முதல் சேர்வோர்க்குரியது  
(10 மற்றும் 12 – ஆம் வகுப்பு வரை தமிழ் மொழிப்பாடம் பயிலாதவர்களுக்கு)  
(பருவத் தேர்வு உண்டு )

அலகு : 1

12 h

நீதி நூல்கள்

- I.ஆத்திசூடி - “அறம் செய விரும்பு” முதல் “ஒளவியம் பேசேல்”வரை -12 பாடல்கள்  
II.கொன்றைவேந்தன் - “அன்னையும் பிதாவும் முன்னறி தெய்வம்” முதல்  
“எண்ணும் எழுத்தும் கண் எனத் தகும்” வரை -7 பாடல்கள்

III.திருக்குறள் - 6 பாடல்கள்

1. அகர முதல .....1
2. மனத்துக் கண்.....34
3. இனிய உளவாக .....100
4. தீயவை தீய பயத்தலான்.....202
5. கற்க கசடற .....391
6. கண்ணொடு கண்ணினை.....1100

அலகு : 2

12 h

I. எளிய நீதிக்கதைகளும் வாழ்க்கை முறைகளும்

1. நீதிகாத்த மன்னன்
2. சிங்கமும் முயலும்
3. புத்திசாலி உழவனும் போக்கிரிப் பூதமும்
4. தேனீயும் புறாவும்
5. முயல் கூறிய தீர்ப்பு

II. தமிழகப் பண்பாடுகள்

1. தமிழர் விழாக்கள் - பொங்கல், ஆடிப்பெருக்கு
2. தமிழர் கலைகள் - தெருக்கூத்து, ஓவியம், சிற்பம்
3. தமிழர் விளையாட்டுகள்- ஏறுதழுவுதல், சடுகுடு



Dr.NGPASC

COIMBATORE | INDIA

B.Sc. Computer Science with Cognitive Systems (Students admitted during the AY 2020-21)

### III . பயிற்சிப் பகுதி

1. படத்திற்கு ஏற்ற சொற்களை எழுதுதல்.
2. சொற்களைத் தொடராக்குதல்.
3. பொருத்துதல்,
4. உரையாடல் பகுதி

**Note:** பயிற்சிப் பகுதியில் வினாக்கள் அமைத்தல் கூடாது

வினாத்தாள் அமைப்பு முறை - மொத்த மதிப்பெண்கள் - 100

பகுதி - அ

சரியான விடையைத் தேர்வு செய்தல் 10x2=20

பகுதி - ஆ

சரியா? தவறா? தேர்ந்தெடுத்து எழுதுக . 10x2=20

பகுதி - இ

ஒரு பக்க அளவில் விடையளிக்க 03x20=60

குறிப்பு:

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

### Text Books

- 1 அடிப்படைத்தமிழ் - 20-21. தொகுப்பு : தமிழ்த்துறை , டாக்டர் என்.ஜி.பி. கலை அறிவியல் கல்லூரி, நியூ செஞ்சுரி புக் ஹவுஸ்(பி)லிட். சென்னை-600 098

### References

- 1 ஒன்றாம் வகுப்பு பாடநூல் - தமிழ்நாடு அரசு பாடநூல் கழகம்
- 2 வலைதள முகவரி : <http://tamilvu.org>





191TL1A4AB	பகுதி – 4 : சிறப்புத்தமிழ் - தாள் : II (Advanced Tamil )	SEMESTER - IV
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Total Credits: 2

Total Instruction Hours: 24 h

இளங்கலை 2019– 2020 ஆம் கல்வியாண்டு முதல் சேர்வோர்க்குரியது  
(10 மற்றும் 12 – ஆம் வகுப்புகளில் தமிழ் மொழிப்பாடம் பயின்றவர்களுக்கு உரியது  
(பருவத் தேர்வு உண்டு )

அலகு – 1

05 h

திருக்குறள்

I அறத்துப்பால்

1. இனியவை கூறல் - அதிகார எண் : 10
2. அடக்கமுடைமை - அதிகார எண் : 13

II பொருட்பால்

1. கல்வி - அதிகார எண் : 40
2. உழவு - அதிகார எண் : 104

III இன்பத்துப்பால்

1. தகையணங்குறுத்தல் - அதிகார எண் : 109
2. பிரிவாற்றாமை - அதிகார எண் : 116

அலகு – 2

05 h

கட்டுரைத் தொகுப்பு

I நல்வாழ்வு - டாக்டர் மு.வரதராசன்

1. நம்பிக்கை
2. புலனடக்கம்
3. பண்பாடு

II இளைஞர்களின் ஒளிமயமான எதிர்காலத்திற்கு - கு.வெ. பாலசுப்பிரமணியம்

1. காலக்கணக்கு
2. நற்பழக்கமே செல்வம்

அலகு – 3

05 h

I காப்பியங்கள் - குறிப்பு எழுதுதல்

1. சிலப்பதிகாரம்
2. மணிமேகலை
3. கம்பராமாயணம்
4. பெரியபுராணம்



**II ஊடகம் - காட்சி ஊடகங்கள்**

1. தொலைக்காட்சி
2. திரைப்படம்
3. இணையம்
4. முகநூல்
5. கீச்சகம்
6. கட்செவி அஞ்சல்

அலகு - 4

05 h

**இலக்கணம் - வழக்கறிதல்**

1. இயல்பு வழக்கு
2. தகுதி வழக்கு

அலகு - 5

04 h

**I படைப்பாற்றல் பகுதி**

கவிதை,கட்டுரை எழுதச்செய்தல் - பொதுத் தலைப்பு

**II பயிற்சிப் பகுதி**

தமிழில் தட்டச்சு செய்தல் - யூனிகோடு எழுத்துருவில்.

**Note:** பயிற்சிப் பகுதியில் வினாக்கள் அமைத்தல் கூடாது

வினாத்தாள் அமைப்பு முறை - மொத்த மதிப்பெண்கள் - 100

பகுதி -அ

சரியான விடையைத் தேர்வு செய்தல்

10x2=20

பகுதி -ஆ

கோடிட்ட இடங்களை நிரப்புக

10x2=20

பகுதி -இ

இரண்டு பக்க அளவில் விடையளிக்க

4x15=60

**குறிப்பு :**

- அனைத்து அலகுகளில் இருந்தும் இரண்டு வினாக்கள் அமைதல் வேண்டும்
- பகுதி இ -க்கான வினாக்கள் இது அல்லது அது என்ற வகையில் அந்தந்த அலகுகளிலிருந்து அமைதல் வேண்டும்.



## Text Books

- 1 சிறப்புத்தமிழ் 20-21. தொகுப்பு : தமிழ்த் துறை , டாக்டர் என்.ஜி.பி. கலை அறிவியல் கல்லூரி, நியூ செஞ்சுரி புக் ஹவுஸ்(பி) லிட். 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 வலைதள முகவரி : <http://tamilvu.org>



<b>192PY1A4AA</b>	<b>AECC : GENERAL AWARENESS</b>	<b>SEMESTER IV</b>
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**Total Credits:** 2  
**Total Instructions Hours:** 24 h

<b>S.No</b>	<b>Contents</b>
1	Current Events
2	General Science
3	Geography of India
4	Tamil and Other Literature
5	Inventions and Discoveries
6	Numerical and Mental Aptitude
7	Verbal and Non Verbal Reasoning
8	Socio- Culture and Heritage of India
9	Indian Economy and Political System
10	History of India and Freedom Struggle

### References

- 1 Majid Hussain, Arora N D, 2019, "General Studies -TNPSC Group -I ", G.K.Publications (P) Ltd. New Delhi
- 2 Aggarwal R S, 2014, "Verbal and Non Verbal Reasoning" S Chand & Company, New Delhi
- 3 Competition Success Review, Competitive Success Publisher, New Delhi
- 4 Pratiyogita Darpan, Pratiyogita Darpan Publishers, Agra.



Course Code	Course Name	Category	L	T	P	Credit
204CG1A5CA	INTRODUCTION TO DIGITAL TECHNOLOGIES	CORE	4	1	0	4

### PREAMBLE

This course has been designed for students to learn and understand

- The basic digital primer concepts
- The Implementation of RPA
- AA Enterprise and Architecture

### COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the different immersive technology	K1
CO2	Inspect the different digital services in industry	K2
CO3	Implementing the RPA Architecture	K3
CO4	Understand the concepts of AA Enterprise Concepts	K1
CO5	Build the application using bots	K2

### MAPPING WITH PROGRAMME OUTCOMES

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



<b>204CG1A5CA</b>	<b>INTRODUCTION TO DIGITAL TECHNOLOGIES</b>	<b>SEMESTER V</b>
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**Total Credits: 4**

**Total Instruction Hours: 60 h**

### **Syllabus**

**Unit I**      Digital Primer 12 h

Why is Digital Different, Digital Metaphors, On Cloud 9, A Small Intro to Big Data, social media & Digital Marketing, Artificial Intelligence, Unchain the Blockchain, Internet of Everything, Immersive Technology

**Unit II**      Digital for Industries 12 h

Manufacturing and Hi-tech, Banking and Financial Services, Insurance and Healthcare, Retail, Travel & Hospitality, Communications, Media & Information Services and Government

**Unit III**      Automatix – Art of RPA 12 h

Introduction - Setting the Context, RPA Prelude, RPA Demystified, RPA vs BPM, RPA Implementations, RPA in Industries, RPA Tools, Automatix

**Unit IV**      Automation Anywhere 12 h

Getting Started with AA Enterprise, Exploring AA Enterprise, AA Enterprise – Architecture

**Unit V**      TaskBots 12 h

Knowing the Bots - More About TaskBots - AA Enterprise - All About Recorders - Designers -MetaBots - Cognitive RPA.



## Text Books

- 1 Richard Murdoch, 2018, “Robotic Process Automation: Guide to Building Software Robots, Automate Repetitive Tasks & Become an RPA Consultant”

## References

- 1 Kelly Wibbenmeyer, 2018, “The Simple Implementation Guide to Robotic Process Automation (RPA): How to Best Implement RPA in an Organization”



Course Code	Course Name	Category	L	T	P	Credit
204CG1A5CB	PROCESS MANAGEMENT	CORE	4	0	0	3

### PREAMBLE

This course has been designed for students to learn and understand

- Basics of Software and Software Engineering
- Agile Methodologies, Advantages and Disadvantages
- Performance Measurement through KPIS and Metrics

### COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the basic concepts of Software Engineering	K1
CO2	Understand the agile methodologies	K2
CO3	Understand the Scrum Theory, Scrum Values and Events	K2
CO4	Analyze the performance of KPIS in DevOps	K3
CO5	Learn about the design thinking and Strategy	K1

### MAPPING WITH PROGRAMME OUTCOMES

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





<b>204CG1A5CB</b>	<b>PROCESS MANAGEMENT</b>	<b>SEMESTER V</b>
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**Total Credits: 3**

**Total Instruction Hours: 48 h**

### **Syllabus**

**Unit I**      Software and Software Engineering      10 h

The Nature of Software, The Unique Nature of WebApps, Software Engineering-Software Process, Software Engineering Practice-Software Myths. Software Process Model: A Generic Process Model, Process Assessment and Improvement, Perspective Process Models, Specialized Process Model, The Unified Process. Software Engineering Code of Ethics.

**Unit II**      Agile      10 h

What Is Agile, Understanding Agile Value, Agile Manifesto, Principles of Agile, Agile Methodologies, Advantages and Disadvantages of Agile - Agile anti-patterns, Scaled Agile Framework, Why Lean UX, The Three Foundations of Lean UX, Principles of Lean UX

**Unit III**      Scrum      10 h

Definition of Scrum, Uses of Scrum, Scrum Theory, Scrum Values, The Scrum Team, Scrum Events, Scrum Artifacts, Artifact Transparency.

**Unit IV**      DevOps      9 h

Introduction to DevOps, methodologies, principles, strategies, Automation, Performance Measurement through KPIS and Metrics, Agile and DevOps, Agile Infrastructure, Velocity, Lean Startup UPS

**Unit V**      Design Thinking      9 h

Introduction to Design Thinking – Lean thinking, Actionable Strategy, The Problem with Complexity, Vision and Strategy, Defining Actionable Strategy Act to Learn, Leading Teams to Win



## Text Books

- 1 Roger S Pressman, 2010 "Software Engineering a Practitioner's Approach", 7th Edition.
- 2 Ken Schwaber and Jeff Sutherland, 2017, "The Scrum Guide"

## References

- 1 Andrew Stellman & Jennifer Greene, 2014, "Learning Agile", O'Reilly Media, First Edition



Course Code	Course Name	Category	L	T	P	Credit
204CG1A5CC	SOFTWARE TESTING	CORE	4	0	0	4

### PREAMBLE

This course has been designed for students to learn and understand

- Basic Concepts of Selenium
- Selenium web driver and Elements
- Advance Selenium

### COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn about basics of Selenium	K1
CO2	Implementation of selenium web driver and elements	K2
CO3	Apply the selenium elements	K3
CO4	Implementation of test automation framework	K3
CO5	Analyzing the advance selenium tools	K3

### MAPPING WITH PROGRAMME OUTCOMES

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



<b>204CG1A5CC</b>	<b>SOFTWARE TESTING</b>	<b>SEMESTER V</b>
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**Total Credits: 4**

**Total Instruction Hours: 48 h**

### **Syllabus**

**Unit I**      Selenium Basics      10 h

Software Testing, Automation Testing, Introduction to Selenium and its Components, Selenium IDE Features, Selenium Download and Installation, Creating Scripts using Firebug and Its Installation, Locator Types

**Unit II**      Selenium WebDriver      10 h

Selenium WebDriver Installation with Eclipse, Handling Dropdowns, Explicit and Implicit Wait

**Unit III**      Selenium Elements      9 h

Handling Alerts/Pop-ups, Handling Web Tables, Frames, Dynamic Elements, Robot API, AutoIT

**Unit IV**      Selenium Framework      10 h

Introduction to TestNG, Test Automation Framework

**Unit V**      Advance Selenium      9 h

Selenium Grid Introduction, Transition Testing - States, State Graph, State Testing



## Text Books

- 1 Navneesh Garg, "Test Automation using Selenium WebDriver with Java: Step by Step"

## References

- 1 Rex Allen Jones II, "Absolute Beginner Java 4 Selenium Web driver: Come Learn How to Program for Automation Testing"



Course Code	Course Name	Category	L	T	P	Credit
204CG1A5CD	INFORMATION TECHNOLOGY INFRASTRUCTURE LIBRARY	CORE	3	0	0	3

### PREAMBLE

This course has been designed for students to learn and understand

- Basics of ITIL 4
- Key Concepts of Service Management
- ITIL 4 Dimension Model of IT Service Management

### 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 ITIL4	K1,k2
CO2	Learn Key Concepts of Service Management	K2
CO3	Describe the ITIL 4 Dimension Model of IT Service Management	K3
CO4	Outline the Service Value Chain (SVC)	K2
CO5	Learn the concept of Service Management	K3

### MAPPING WITH PROGRAMME OUTCOMES

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



204CG1A5CD	INFORMATION TECHNOLOGY INFRASTRUCTURE LIBRARY	SEMESTER V
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**Total Credits: 3**

**Total Instruction Hours: 36 h**

### Syllabus

**Unit I** Introduction to ITIL 4 8 h

IT Service Management in the modern world-About ITIL v4- The structure and benefits of the ITIL v4 Framework

**Unit II** Key Concepts of Service Management 7 h

Value and Value Co-Creation- Stakeholders- Products and Services- Service Relationships and Value

**Unit III** ITIL 4 Dimension Model of IT Service Management 7 h

Organization & People-Information & Technology-Partners & Suppliers-Value Streams & Processes-External factors

**Unit IV** ITIL Service Value System 7 h

Service Value System (SVS) Overview-Opportunity, demand, and Value-Guiding Principles-Governance-Service Value Chain (SVC)-Continual Improvement-Practices

**Unit V** ITIL Management Practices 7 h

General Management Practices; Service Management Practices; Technical Management Practices



## Text Books

- 1 Clyde Bank Technology, "ITIL For Beginners: The Complete Beginner's Guide to ITIL"

## References

- 1 ITIL Foundation v4 Edition - PDF
- 2 ITIL For Beginners: The Complete Beginner's Guide to ITIL - PDF
- 3 ITIL for Dummies - PDF





<b>204CG1A5CP</b>	<b>CORE PRACTICAL: DIGITAL TECHNOLOGIES</b>	<b>SEMESTER V</b>
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**Total Credits: 2**

**Total Instructions Hours: 48 h**

<b>S.No</b>	<b>List of Experiments</b>
<b>1</b>	Creating bots for automatic software installation
<b>2</b>	Creating bots for automatic software patch installation
<b>3</b>	Creating bots for file transfer
<b>4</b>	Creating bots for automatic file backup



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COIMBATORE | INDIA

*B.Sc. Computer Science with Cognitive Systems (Students admitted during the AY 2020-21)*

204CG1A5CQ	CORE PRACTICAL: SOFTWARE TESTING	SEMESTER V
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**Total Credits: 2**

**Total Instructions Hours: 48 h**

**S.No**

**List of Experiments**

- 1 Develop a test to Open a Firefox browser using Selenium Web driver
- 2 Test the case To Print a Message to display that the website is opened successfully Wait for 5 Seconds and Close the Browser
- 3 Develop a test to Upload a file with Send Keys method by using Web driver
- 4 Automate to Access a Link in Selenium Web driver by linkText() and partialLinkText()
- 5 To locate a link by Selecting multiple items in a dropdown
- 6 Develop a test to locate a frame using Tag Name
- 7 Test the case to submit a login form using Web driver
- 8 Develop a test to Synchronize with an implicit wait
- 9 Develop a test to Synchronize with an explicit wait
- 10 Test the case by Identifying and handling a pop-up window by its name



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Course Code	Course Name	Category	L	T	P	Credit
204CG1A5DA	DESIGN THINKING	DSE	4	0	0	4

### PREAMBLE

This course has been designed for students to learn and understand

- Introduction to design thinking
- Design thinking approach
- Design thinking 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 design thinking	K1
CO2	Understand the design thinking approach	K2
CO3	Apply the design thinking process	K3
CO4	Demonstrate the design led to Innovation	K1
CO5	Understand the benefits of design thinking process	K2

### MAPPING WITH PROGRAMME OUTCOMES

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



<b>204CG1A5DA</b>	<b>DESIGN THINKING</b>	<b>SEMESTER V</b>
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**Total Credits: 4**

**Total Instruction Hours: 48 h**

### **Syllabus**

**Unit I** Introduction to design thinking 10 h

The basics - What is Design thinking/Design Matters - What is not Design Thinking  
Not - Origins of Design thinking - why Design thinking works? - Definition of  
Design thinking - why it is important - Goal of Design Thinking - Uses of Design  
thinking - Literature on Design thinking - Design is a process or product

**Unit II** Design thinking approach 10 h

Frameworks of Design Thinking - The right way to lead Design thinking -  
Fundamental Concepts - Key elements of Design Thinking - Characteristics of  
Design thinking - 4Ds of Design thinking - Design Thinking Resources - Design  
Thinking and Value Creation

**Unit III** Design thinking process 9 h

The Design Thinking process - Mindsets & Modes - Stages in Design Thinking - Is  
Design Thinking is a user centered Approach to problem Solving? - Design  
Thinking in practice - Steps in Design Process - Different Models to Design  
Thinking - Human centered Design Process - An Iterative Cyclic Process - Design  
Thinking Tools

**Unit IV** Design led to Innovation 10 h

Design Thinking Helps to innovate - Process, Toolset or What? - Empathize -  
Define - Ideate - Prototype - Iterate - Test - Communicate Design - Story boarding

**Unit V** Benefits of design thinking process 9 h

Paradigm Shifts, Market Disruptions and Competitive Advantages - Design in  
business - Case studies of Design Thinking - Examples



## Text Books

- 1 Eli Woolery, 2019, Design Thinking Handbook

## References

- 1 Design Thinking A Guide to Creative Problem Solving for Everyone, Andrew Pressman, 2018



Course Code	Course Name	Category	L	T	P	Credit
204CG1A5DB	INTERNET PROGRAMMING	DSE	4	0	0	4

## PREAMBLE

This course has been designed for students to learn and understand

- Basic Internet Protocols
- Basics of Java scripts and its Concepts, Java Servlet Architecture
- PHP Concepts and Ajax Client/Server Architecture

## 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 internet protocols	K1
CO2	Understand the basics of java scripts	K2
CO3	Apply the Servlets concepts in database	K3
CO4	Demonstrate the Built-in functions in PHP	K2
CO5	Apply the Ajax Client/Server Architecture in PHP	K3

## MAPPING WITH PROGRAMME OUTCOMES

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



<b>204CG1A5DB</b>	<b>INTERNET PROGRAMMING</b>	<b>SEMESTER V</b>
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**Total Credits: 4**

**Total Instruction Hours: 48 h**

### Syllabus

#### **Unit I**      Web Essentials 10 h

Clients, Servers and Communication - The Internet - Basic Internet protocols - World wide web - HTTP Request Message - HTTP Response Message - Web Clients - Web Servers - HTML5 - Tables - Lists - Image - HTML5 control elements - Semantic elements - Drag and Drop - Audio - Video controls - CSS3 - Inline, embedded and external style sheets - Rule cascading - Inheritance - Backgrounds - Border Images - Colors - Shadows - Text - Transformations - Transitions - Animations

#### **Unit II**      Java Script 9 h

An introduction to JavaScript - JavaScript DOM Model - Date and Objects - Regular Expressions - Exception Handling - Validation - Built-in objects Event Handling - DHTML with JavaScript - JSON introduction - Syntax - Function Files - Http Request - SQL

#### **Unit III**      Servlets 10 h

Java Servlet Architecture - Servlet Life Cycle - Form GET and POST actions - Session Handling - Understanding Cookies - Installing and Configuring Apache Tomcat Web Server - DATABASE CONNECTIVITY: JDBC perspectives, JDBC program example - JSP: Understanding Java Server Pages - JSP Standard Tag Library (JSTL) - Creating HTML forms by embedding JSP code.

#### **Unit IV**      An introduction to PHP 9 h

PHP - Using PHP- Variables- Program control - Built-in functions - Form Validation - Regular Expressions - File handling - Cookies - Connecting to Database. XML: Basic XML - Document Type Definition - XML Schema DOM and Presenting XML, XML Parsers and Validation, XSL and XSLT Transformation, News Feed (RSS and ATOM).



Ajax Client Server Architecture - XML Http Request Object - Call Back Methods; Web Services: Introduction - Java web services Basics - Creating, Publishing, Testing and Describing a Web services (WSDL) - Consuming a web service, Database Driven web service from an application – SOAP.

### **Text Books**

- 1 Deitel and Deitel and Nieto, 2018, "Internet and World Wide Web - How to Program", Prentice Hall, 5th Edition

### **References**

- 1 Jeffrey C and Jackson, 2011, "Web Technologies A Computer Science Perspective", Pearson Education





Course Code	Course Name	Category	L	T	P	Credit
204CG1A5DC	CYBER SECURITY	DSE	4	0	0	4

### PREAMBLE

This course has been designed for students to learn and understand

- Basic concepts of Cyber Crime and Strategy
- Preventing Cyber Crime and Investigation
- Digital Forensics and Technology

### COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn about the Cyber Crime and Strategy	K1
CO2	Understand the Cyber Security Strategy	K2
CO3	Different methods to Preventing Cyber Crime	K3
CO4	Understand the Digital Forensics and Technology	K2
CO5	Learn about the Cyber Crime and Investigations	K1

### MAPPING WITH PROGRAMME OUTCOMES

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



204CG1A5DC	CYBER SECURITY	SEMESTER V
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**Total Credits: 4**

**Total Instruction Hours: 48 h**

### Syllabus

#### **Unit I** Introduction 9 h

Introduction - Cyber Threat - Definition of Cyber Crime - Classification - Current Threats and Trends - Diversity of Cyber Crime - Cyber Hate Crimes - Cyber Terrorism - Need for cyber security.

#### **Unit II** Cyber Security Strategy 9 h

Cyber Strategy - National Security Strategy - Cyber Security Strategy - Organized Crime Strategy - Cyber Crime Strategy - Policy Cyber Crime - International Response - National Cyber Security Structure - Strategic Policy Requirements - Police and Crime Commissioners

#### **Unit III** Preventing Cyber Crime 10 h

Preventing Cyber Crime - Password Protection - Get Safe Online - Cyber Security Guidance for Business - Cyber Crime Investigation Skills - Criminal Investigation - Code of Ethics - Evidence - Hi-Tech Investigations - Capturing and Analyzing Digital Evidence

#### **Unit IV** Digital Forensics 10 h

Introduction to Digital Forensics - Forensic Software and Hardware - Analysis and Advanced Tools - Forensic Technology and Practices - Forensic Ballistics and Photography - Face-Iris and Fingerprint Recognition - Audio Video Analysis - Windows System Forensics - Linux System Forensics - Network Forensics.

#### **Unit V** Cyber Crime and Investigations 10 h

Cyber Crime and Investigations - Recent Cyber Crime Cases - Recent Digital Forensics Cases - Bridging the Gaps in Cyber Crime Investigations between the Cyber security stake holders.



## Text Books

- 1 Thomas Halt, Adam M. Bossler and Kathryn C. Seigfried Spellar, 2017, "Cybercrime and Digital Forensics: An Introduction", Routledge Taylor and Francis Group"

## References

- 1 Bernadette H Schell, Clemens Martin, 2004, "Cybercrime", ABC – ClioInc, California"



Course Code	Course Name	Category	L	T	P	Credit
192MT1A5AA	RESEARCH METHODOLOGY	AECC	2	-	-	2

### PREAMBLE

This course has been designed for students to learn and understand

- The art of using different research methods and techniques
- Planning and writing of research proposals and dissertations, as well as a thesis
- The necessity for research ethics and guidelines to pursue research

### COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the basics of the research methods and techniques	K1
CO2	Remember the hypothesis, laws related to research problem	K1
CO3	Understand the limitations of experimentation in research	K2
CO4	Illustrate the concept of interdisciplinary and multidisciplinary research	K3
CO5	Analyze the ethics and responsibilities of research	K3

### MAPPING WITH PROGRAMME OUTCOMES

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

**S Strong**

**M Medium**

**L Low**



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*B.Sc. Computer Science with Cognitive Systems (Students admitted during the AY 2020-21)*

192MT1A5AA	RESEARCH METHODOLOGY	SEMESTER V
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**Total Credits: 2**

**Total Instruction Hours: 24 h**

### Syllabus

**Unit I** Introduction to Research 4 h

Research: Introduction- Basic, Applied and Evaluation research – multidisciplinary and interdisciplinary Research – value of research skills – formulating a research problem – Research in relation to Teaching and Publishing

**Unit II** Hypotheses, Theories and Laws 6 h

Hypotheses – Theories – Laws. Scientific statements: their justification and acceptance: verification – Falsification – Acceptance – Peer review

**Unit III** Experimentation and research 5 h

The roles and limitations of experimentation – Experimentation and research – conducting experiments - validity and reliability in experimentation – Design of experiments

**Unit IV** Scientific method and Research Design 4 h

Introduction to Scientific method – Research Design - Components - research design and proposal -checklist in the preparation of proposals

**Unit V** Ethics and Responsibility in Scientific Research 5 h

Ethics – guidelines for Ethical practices in research - unethical to ethics in research - responsibility of Scientists and of Science as an Institution



## Text Books

- 1 Perter Pruzan, (2016), Research Methodology: The Aims, Practices and Ethics of Science. Springer, Switzerland

## References

- 1 Thomas, C.G. (2015) Research Methodology and Scientific Writing. Ane Books Pvt. Ltd.: New Delhi.
- 2 Locharoenrat, K. (2017) Research Methodologies for Beginners. Pan Stanford Publishing: Singapore.
- 3 Ranjit Kumar, (2014) Research Methodology: A Step-by-Step Guide for Beginners. SAGE Publications Ltd.: Singapore.
- 4 Kothari, C.R. Garg, G. (2009) Research Methodology Methods and Techniques. New Age International Publishers, New Delhi..



Course Code	Course Name	Category	L	T	P	Credit
204CG1A6CA	CLIENT RELATIONSHIP MANAGEMENT	CORE	4	0	0	4

### PREAMBLE

This course has been designed for students to learn and understand

- The Interface and Lists and Forms
- UI Customization
- Understanding Data and Relationships

### COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the interface, List and Forms	K1
CO2	Learn about UI Customization	K2
CO3	Understand the Data and Relationships	K1
CO4	Apply the UI and Data Policies	K3
CO5	Demonstrate the User Administration and Security	K3

### MAPPING WITH PROGRAMME OUTCOMES

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



<b>204CG1A6CA</b>	<b>CLIENT RELATIONSHIP MANAGEMENT</b>	<b>SEMESTER VI</b>
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**Total Credits: 4**

**Total Instruction Hours: 48 h**

### **Syllabus**

**Unit I**      The Interface and Lists and Forms      10 h

Versions-Frames-Important application menus and modules-Content Frame-UI Settings and Personalization- List V2 versus List V3-Lists and Tables- Forms

**Unit II**      UI Customization      10 h

Branding your Instance, Custom Themes-UI-Impacting System Properties-Configuring Service Portal UI-Creating a Custom Homepage-Styling Pages and Widgets-Setting up the War Room page-Styling the CMS

**Unit III**      Understanding Data and Relationships      10 h

One to many relationships in ServiceNow-many to many relationships in ServiceNow-Enforcing one to one relationships-Defining Custom Relationships-Database table inheritance- Important Task fields-Journals, and the activity formatter-Extending the task table-Workflows- SLAs-Approvals-Assignment-Creating Task fields

**Unit IV**      UI and Data Policies      9 h

UI Policies-Reverse if false-Scripting in UI policies-UI Policy Order-Data Policies-Converting between data and UI Policies-Data Policies versus ACLs

**Unit V**      User Administration and Security      9 h

User Administration and Security - Users, Groups and Roles, Emails and Notifications, User Preferences, ACLs - Security Rules





## Text Books

- 1 Learning ServiceNow: administration and development on the Now platform, for powerful IT automation by Tom Woodfuff
- 2 ServiceNow Basics: User Training - (PDF shared separately)



Course Code	Course Name	Category	L	T	P	Credit
204CG1A6CB	DATA MINING AND WAREHOUSING	CORE	4	0	0	4

### PREAMBLE

This course has been designed for students to learn and understand

- The Data Mining, Primitives, Languages and System Architecture
- Mining Association Rules and Classification
- Types of Data in Cluster Analysis

### COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the Data Pre-processing	K1
CO2	Understand the Data Mining, Primitives, Languages and System Architecture	K1
CO3	Apply the Mining rules	K3
CO4	Experiment the Classification and Prediction	K3
CO5	Discuss the Cluster Analysis	K2

### MAPPING WITH PROGRAMME OUTCOMES

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



<b>204CG1A6CB</b>	<b>DATA MINING AND WAREHOUSING</b>	<b>SEMESTER VI</b>
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**Total Credits: 4**

**Total Instruction Hours: 48 h**

### **Syllabus**

**Unit I** Introduction 10 h

Data mining - Functionalities - Classification - Introduction to Data Warehousing - Data Pre-processing: Pre-processing the Data - Data cleaning - Data Integration and Transformation - Data Reduction

**Unit II** Data Mining, Primitives, Languages and System Architecture 10 h

Data Mining - Primitives - Data Mining Query Language, Architecture of Data mining Systems. Concept Description, Characterization and Comparison: Concept Description, Data Generalization and Summarization, Analytical Characterization, Mining Class Comparison - Statistical Measures

**Unit III** Mining Association Rules 10 h

Basic Concepts - Single Dimensional Boolean Association Rules from Transaction Databases, Multilevel Association Rules from transaction databases - Multi dimension Association Rules from Relational Database and Data Warehouses

**Unit IV** Classification and Prediction 9 h

Introduction - Issues - Decision Tree Induction - Bayesian Classification - Classification of Back Propagation. Classification based on Concepts from Association Rule Mining - Other Methods. Prediction - Introduction - Classifier Accuracy

**Unit V** Cluster Analysis 9 h

Introduction - Types of Data in Cluster Analysis, Partitioning Methods - Hierarchical Methods-Density Based Methods - GRID Based Method - Model based Clustering Method



## Text Books

- 1 J.Han and M. Kamber, 2012, “Data Mining Concepts and Techniques”,  
Harcourt India Pvt. Ltd, New Delhi

## References

- 1 K.P. Soman , Shyam Diwakar, V.Ajay, 2006, “Insight into Data Mining  
Theory and Practice”, Prentice Hall of India Pvt. Ltd, New Delhi.



<b>204CG1A6CP</b>	<b>CORE PRACTICAL: CLIENT RELATIONSHIP MANAGEMENT</b>	<b>SEMESTER VI</b>
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**Total Credits: 2**  
**Total Instructions Hours: 48 h**

<b>S.No</b>	<b>List of Experiments</b>
<b>1</b>	Navigation and the User Interface
<b>2</b>	Navigating Applications
<b>3</b>	Searching
<b>4</b>	Lists
<b>5</b>	Finding Information in Lists
<b>6</b>	Filters and Breadcrumbs
<b>7</b>	Editing Lists
<b>8</b>	Creating Personal Lists
<b>9</b>	Forms
<b>10</b>	Forms Creation



Course Code	Course Name	Category	L	T	P	Credit
204CG1A6DA	WIRELESS NETWORKS	DSE	4	0	0	4

### PREAMBLE

This course has been designed for students to learn and understand

- Introduction-WLAN Technologies
- TCP Enhancements for Wireless Protocols
- UMTS Network Architecture

### COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic WLAN Technologies	K1
CO2	Understand the Mobile IP	K2
CO3	Learn about TCP Enhancements for Wireless Protocols	K2
CO4	Understand the UMTS Network Architecture	K1
CO5	Illustrate the 4G Technologies	K3

### MAPPING WITH PROGRAMME OUTCOMES

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



<b>204CG1A6DA</b>	<b>WIRELESS NETWORKS</b>	<b>SEMESTER VI</b>
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**Total Credits: 4**

**Total Instruction Hours: 48 h**

### **Syllabus**

**Unit I** Introduction-WLAN Technologies 10 h

Infrared, UHF Narrowband, Spread Spectrum - IEEE802.11: System Architecture, Protocol Architecture, Physical Layer, MAC Layer, 802.11b, 802.11a - Hiper LAN: WATM, BRAN, HiperLAN2 - Bluetooth: Architecture, Radio Layer, Baseband Layer, Link Manager Protocol, Security - IEEE802.16-WIMAX: Physical Layer, MAC, Spectrum Allocation For WIMAX.

**Unit II** Introduction - Mobile IP 10 h

IP Packet Delivery, Agent Discovery, Tunneling and Encapsulation, IPV6-Network Layer In The Internet - Mobile IP Session Initiation Protocol - Mobile Ad-Hoc Network: Routing, Destination Sequence Distance Vector, Dynamic Source Routing

**Unit III** TCP Enhancements for Wireless Protocols 10 h

Congestion Control, Fast Retransmit/Fast Recovery, Implications Of Mobility - Classical TCP Improvements: Indirect TCP, Snooping TCP, Mobile TCP, Time Out Freezing, Selective Retransmission, Transaction Oriented TCP - TCP Over 3G Wireless Networks.

**Unit IV** UMTS Network Architecture 9 h

Overview Of UMTS Terrestrial Radio Access Network - UMTS Core Network Architecture: 3G-MSC, 3G-SGSN, 3G-GGSN, SMS-GMSC/SMS-IWMSC, Firewall, DNS/DHCP - High Speed Downlink Packet Access (HSDPA) - LTE Network Architecture And Protocol

**Unit V** 4G Technologies 9 h

Introduction - 4G Vision - 4G Features And Challenges - Applications of 4G - 4G Technologies: Multicarrier Modulation-Smart Antenna Techniques- OFDM-MIMO Systems- Adaptive Modulation And Coding With Time Slot Scheduler-Cognitive Radio.



## Text Books

- 1 Jochen Schiller, 2016, “Mobile Communications”, Second Edition, Pearson Education. (Unit I,II,III)
- 2 Vijay Garg, 2015, “Wireless Communications and Networking”, First Edition (Unit IV,V)

## References

- 1 Simon Haykin , 2013, Michael Moher, David Koilpillai, “Modern Wireless Communications”, First Edition, Pearson Education.
- 2 Anurag Kumar, D.Manjunath, Joy Kuri, 2011, “Wireless Networking”, First Edition, Elsevier.





Course Code	Course Name	Category	L	T	P	Credit
204CG1A6DB	SOFTWARE DESIGN WITH UML	DSE	4	0	0	4

### PREAMBLE

This course has been designed for students to learn and understand

- Introduction To Uml
- The Object-Oriented Design Process
- Patterns And GUI Programming

### COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the UML Concepts	K1
CO2	Examine the Object-Oriented Design Process	K2
CO3	Analyze the Class Design	K2
CO4	Implement the GUI Programming	K3
CO5	Apply the simple framework	K3

### MAPPING WITH PROGRAMME OUTCOMES

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



<b>204CG1A6DB</b>	<b>SOFTWARE DESIGN WITH UML</b>	<b>SEMESTER VI</b>
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**Total Credits: 4**

**Total Instruction Hours: 48 h**

### **Syllabus**

**Unit I** Introduction To UML 10 h

Introduction to object-oriented concepts like inheritance, Polymorphism, Information hiding, Importance of modelling, Principles of modelling, Object oriented modelling, An overview of UML, Conceptual model of the UML, Architecture, Software development life cycle

**Unit II** The Object-Oriented Design Process 10 h

The object and class Concepts, Identifying classes, Identifying responsibilities, Relationships between Classes, Use Cases, CRC cards, UML class diagrams, Sequence diagrams, State diagrams, Using Java doc for design documentation, Case Study: A voice mail system.

**Unit III** Class Design 10 h

An overview of the date classes in the java library, designing a day class, the importance of encapsulation, analyzing the quality of an interface, programming by contract, unit testing

**Unit IV** Patterns and GUI Programming 9 h

Iterators, the pattern concept, the observer pattern, layout managers and the strategy pattern, components, containers and the composite pattern, scroll bars and the decorator pattern, how to recognize patterns, putting patterns to work

**Unit V** Frameworks 9 h

Frameworks, applets as a simple framework, the collections framework, a graph editor framework, enhancing the graph editor framework



## Text Books

- 1 Grady Booch, James Rumbaugh, Ivar Jacobson, 2016, The Unified Modeling Language User guide, 2nd edition, Pearson Education, New Delhi, India
- 2 Cay Horstmann, 2009, Object-Oriented Design and Patterns, Wiley India edition, New Delhi, India.

## References

- 1 Meilir Page-Jones ,2010, Fundamentals of Object-Oriented Design in UML, Pearson Education and New York
- 2 Craig Larman, 2005, An introduction to Object -Oriented Analysis and Design and Unified Process Applying UML and Patterns, 3rd edition, Pearson Education, New Delhi, India



Course Code	Course Name	Category	L	T	P	Credit
204CG1A6DC	MOBILE COMPUTING	DSE	4	0	0	4

### PREAMBLE

This course has been designed for students to learn and understand

- Mobile Communications and System Architecture
- MAC and TCP protocol
- Classification of Routing Algorithms

### COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the mobile computing Concepts	K1
CO2	Examine the various protocols	K2
CO3	Compare the TCP and Other protocols	K1
CO4	Understand the Broadcast Models	K3
CO5	Implement the difference routing algorithms	K3

### MAPPING WITH PROGRAMME OUTCOMES

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



204CG1A6DC	MOBILE COMPUTING	SEMESTER VI
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**Total Credits:** 4

**Total Instruction Hours:** 48 h

### Syllabus

#### **Unit I** Introduction 10 h

Mobile Communications, Mobile Computing - Paradigm, Promises/Novel Applications and Impediments and Architecture; Mobile and Handheld Devices, Limitations of Mobile and Handheld Devices. GSM - Services, System Architecture, Radio Interfaces, Protocols, Localization, Calling, Handover, Security, New Data Services, GPRS.

#### **Unit II** MAC 10 h

Motivation for a specialized MAC (Hidden and exposed terminals, Near and far terminals), SDMA, FDMA, TDMA, CDMA, Wireless LAN/(IEEE 802.11) - Mobile Network Layer IP and Mobile IP Network Layers, Packet Delivery and Handover Management, Location Management, Registration, Tunneling and Encapsulation, Route Optimization, DHCP.

#### **Unit III** TCP 9 h

Conventional TCP/IP Protocols, Indirect TCP, Snooping TCP, Mobile TCP, Other Transport Layer Protocols for Mobile Networks. Database Issues: Database Hoarding and Caching Techniques, Client-Server Computing & Adaptation, Transactional Models, Query processing, Data Recovery Process & QoS Issues

#### **Unit IV** Broadcast Models 9 h

Communications Asymmetry, Classification of Data Delivery Mechanisms, Data Dissemination, Broadcast Models, Selective Tuning and Indexing Methods, Data Synchronization

#### **Unit V** Classification of Routing Algorithms 10 h

Introduction, Applications & Challenges of a MANET, Routing, Classification of Routing Algorithms, Algorithms such as DSR, AODV, DSDV, Mobile Agents, Service Discovery. Protocols and Platforms for Mobile Computing: WAP, Bluetooth, J2ME, iOS/Windows CE, Android - Security.



## Text Books

- 1 Jochen Schiller, 2015 “Mobile Communications”, Addison-Wesley, Second Edition

## References

- 1 Raj Kamal, 2010 “Mobile Computing”, Oxford University Press.



Course Code	Course Name	Category	L	T	P	Credit
204CG1A6DD	ARTIFICIAL INTELLIGENCE	DSE	4	0	0	4

### PREAMBLE

This course has been designed for students to learn and understand

- Introduction to AI & Production Systems
- Knowledge Inference & Planning
- Machine Learning & Expert Systems

### COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the fundamentals of Artificial Intelligence	K1
CO2	Understand the Representation of Knowledge	K2
CO3	Apply the knowledge Inference	K3
CO4	Build the applications using machine Learning	K2
CO5	Expose the concept of Prolog	K2

### MAPPING WITH PROGRAMME OUTCOMES

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



<b>204CG1A6DD</b>	<b>ARTIFICIAL INTELLIGENCE</b>	<b>SEMESTER VI</b>
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**Total Credits: 4**

**Total Instruction Hours: 48 h**

### **Syllabus**

**Unit I** Introduction to AI & Production Systems 10 h

Introduction to AI-Problem formulation, Problem Definition -Production systems, Control strategies, Search strategies. Problem solving methods - Problem graphs, Matching. Heuristic functions - Hill Climbing-Depth first and Breadth first search, A\* Algorithm, Simulated Annealing, Constraints satisfaction.

**Unit II** Representation of Knowledge 10 h

Game playing -Predicate logic - Representing Instance and Is-a Relationship, Introduction to predicate calculus, Resolution, Knowledge representation - Production based system, Frame based system.

**Unit III** Knowledge Inference & Planning 10 h

Inference - Backward chaining, Forward chaining, Rule value approach, Fuzzy reasoning -Certainty factors -Basic plan generation systems - Strips -Advanced plan generation systems - K strips

**Unit IV** Machine Learning & Expert Systems 9 h

Learning- Machine learning, Adaptive Learning. Expert systems - Architecture of expert systems, Roles of expert systems - Knowledge Acquisition - Meta knowledge. Typical expert systems-MYCIN, DART, XOON, Expert systems shells

**Unit V** PROLOG 9 h

Programming in Logic (PROLOG): Introduction, Prolog variables, Syntax, Using rules, Input and Output predicates, Procedural and declarative meanings, Arithmetic operation, unification, lists, control structures, use of fail, CUT, Not.





## Text Books

- 1 Kevin Knight and Elaine Rich, Nair B., 2017, “Artificial Intelligence (SIE)”, McGraw Hill
- 2 Deepak Khemani, 2013 “Artificial Intelligence”, Tata Mc Graw Hill Education

## References

- 1 Ivan Brako, 2011, “PROLOG: Programming for Artificial Intelligence”, 3rd Edition Pearson
- 2 Stuart Russel and Peter Norvig, 2007 “AI – A Modern Approach”, 2nd Edition, Pearson Education



Course Code	Course Name	Category	L	T	P	Credit
204CG1A6DE	DEVOPS APPLICATION	DSE	4	0	0	4

### PREAMBLE

This course has been designed for students to learn and understand

- Traditional Software Development
- Rise of Agile methodologies
- the Purpose of Devops

### COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the Advent of Software Engineering	K1
CO2	Learn about Agile methodologies	K2
CO3	Understand the DevOps	K1
CO4	Apply the DevOps	K3
CO5	Demonstrate the CAMS and applications	K1

### MAPPING WITH PROGRAMME OUTCOMES

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



<b>204CG1A6DE</b>	<b>DEVOPS APPLICATION</b>	<b>SEMESTER VI</b>
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**Total Credits: 4**

**Total Instruction Hours: 48 h**

### **Syllabus**

**Unit I** Traditional Software Development 10 h

The Advent of Software Engineering - Waterfall method - Developers vs IT Operations conflict

**Unit II** Rise of Agile Methodologies 10 h

Agile movement in 2000 - Agile Vs Waterfall Method - Iterative Agile Software Development - Individual and team interactions over processes and tools - Working software over -comprehensive documentation - Customer collaboration over contract negotiation - Responding to change over following a plan

**Unit III** Definition of DevOps 9 h

Introduction to DevOps - DevOps and Agile

**Unit IV** Purpose of DevOps 9 h

Minimum Viable Product - Application Deployment - Continuous Integration - Continuous Delivery

**Unit V** CAMS (Culture, Automation, Measurement and Sharing) 10 h

CAMS - Culture - CAMS - Automation - CAMS - Measurement - CAMS - Sharing - Test-Driven Development - Configuration Management - Infrastructure Automation - Root Cause Analysis - Blamelessness - Organizational Learning



## Text Books

- 1 Gene Kim, Jez Humble, Patrick Debois, and Willis Willis, 2016, “The DevOps Handbook”, Kindle Edition.

## References

- 1 Mike Loukides, 2015, “What is DevOps”, Kindle Edition, O'Reilly Media.



Course Code	Course Name	Category	L	T	P	Credit
204CG1A6DF	NETWORK SECURITY	DSE	4	0	0	4

### PREAMBLE

This course has been designed for students to learn and understand

- The Classical Encryption Techniques
- The Various Network Algorithm
- Authentication applications

### COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the Classical Encryption Techniques	K1
CO2	Understand the network algorithm	K2
CO3	Apply the knowledge of authentication	K3
CO4	Enumerate the Authentication applications	K2
CO5	Understand the Virus and Threats	K1

### MAPPING WITH PROGRAMME OUTCOMES

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



204CG1A6DF	NETWORK SECURITY	SEMESTER VI
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**Total Credits:** 4

**Total Instruction Hours:** 48 h

### Syllabus

#### **Unit I**      Classical Encryption Techniques 10 h

Model of network security - Security attacks, services and attacks - OSI security architecture - Classical encryption techniques - SDES - Block cipher Principles DES - Strength of DES - Block cipher design principles - Block cipher mode of operation - Evaluation criteria for AES - RC4 - Differential and linear cryptanalysis - Placement of encryption function - Traffic confidentiality

#### **Unit II**      Network Algorithm 10 h

Number Theory - Prime number - Modular arithmetic - Euclid's algorithm - Fermet's and Euler's theorem - Primality - Chinese remainder theorem - Discrete logarithm - Public key cryptography and RSA - Key distribution - Key management - Diffie Hellman key exchange - Elliptic curve cryptography

#### **Unit III**      Authentication 10 h

Authentication requirement - Authentication function - MAC - Hash function - Security of hash function and MAC - SHA - HMAC - CMAC - Digital signature and authentication protocols - DSS.

#### **Unit IV**      Kerberos 9 h

Authentication applications - Kerberos - X.509 Authentication services - E-mail security - IP security - Web security

#### **Unit V**      Virus and Threats 9 h

Intruder - Intrusion detection system - Virus and related threats - Countermeasures - Firewalls design principles - Trusted systems - Practical implementation of cryptography and security



## Text Books

- 1 William Stallings, 2017, “Cryptography & Network Security”, Pearson Education, 7th Edition.

## References

- 1 Charlie Kaufman, Radia Perlman, 2022, Mike Speciner, “Network Security, Private communication in public world”, PHI Second Edition



Course Code	Course Name	Category	L	T	P	Credit
193BC1A6AA	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 an 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	S	M	M	M	M
CO2	S	M	M	M	M
CO3	S	M	M	M	M
CO4	S	M	M	M	M
CO5	S	M	M	M	M

**S Strong**

**M Medium**

**L Low**





193BC1A6AA	INNOVATION, IPR AND ENTREPRENEURSHIP	SEMESTER VI
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**Total Credits: 2**

**Total Instruction Hours: 24 h**

### Syllabus

#### **Unit I** Introduction to Innovation, IPR 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 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 - Infringement of Patent.

Case Study: When Google was used for Patent Infringement.

#### **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: Trademark mismanagement by Cadbury's.

#### **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: Copyright Case of Napster and Grokster.

#### **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: The story of the Tirupati Laddu.

**Note:**Case studies related to the above topics to be discussed (Examined internal

ly) Dr.NGPASC



COIMBATORE | INDIA

*B.Sc. Computer Science with Cognitive Systems (Students admitted during the AY 2020-21)*

## Text Book

- 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>.

