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

# **REGULATIONS 2019-20 for Under Graduate Programme** (Outcome Based Education model with Choice Based Credit System)

### **Bachelor of Science in Information Technology Degree**

(For the students admitted during the academic year 2019-20 and onwards)

#### **Programme: B. Sc(Information Technology)**

### Eligibility:

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

### **Programme Educational Objectives:**

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

1. Demonstrating a substantial understanding of concepts in key areas of Information Technology and its applications.

2. Analysis and synthesis involved in Computer System, Information System and Computer applications.

3. To develop a software and in its design and implementation for professional competence

4. To equip and train the students to meet the requirement of the IT Industries and Public Sectors.

5. To stimulate an interest in computing as an academic discipline with a view to encouraging progression to research and higher studies.



# **PROGRAMME OUTCOMES:**

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

PO Number	POStatement					
PO1	Understand the fundamental concept of Information Technology					
PO2	Gain knowledge on programming language to constructs application and packages					
PO3	Improve programming knowledge to solve real-world problems using Information Technology					
PO4	Develop necessary skills to design digital system					
PO5	Enhance problem solving, analytical, communication, team work and potential to develop software and network management					



Part	Subjects	No.of Papers	Credit	Semester No.
Ι	Tamil / Hindi / French/Malayalam	2	2 x 3 = 6	I & II
II	English	2	$2 \times 3 = 6$	I & II
	Core (Credits 2,3,4)	18-20	70	I to VI
	Inter Departmental Course (IDC)	4	16	I to IV
тт	Discipline Specific Elective (DSE)	3	3 x 4 =12	V & VI
111	Skill Enhancement Course(SEC)	4	4 x 3=12	III &IV
	Generic Elective(GE)	2	2 x 2=4	III & IV
	Lab on Project (LoP)	1	1	III to V
	Environmental Studies(AECC)	1	2	Ι
	Value Education (VE) (Human Rights, Womens' Rights) (AECC)	2	4	II and III
IV	General Awareness(On-Line Exam) (AECC)	1	2	IV
	RM ( AECC)	1	2	V
	Innovation, IPR, Entrepreneurship (AECC)	1	2	VI
v	Extension Activity NSS / Sports / Department Activity	_	1	I to VI
	TOTAL CREDITS	140		

# Guidelines for Programmes offering Part I& Part II for Two Semesters:



#### CURRICULUM

### **B.Sc. INFORMATION TECHNOLOGY PROGRAMME**

Course Code	Course	Course Name	т	т	D	Exam	Max Marks			Credits
Course Coue	Category Course Walke E				(h)	CIA	ESE	Total	cicuits	
First Semester										
Part – I										
191TL1A1TA		Tamil-I								
191TL1A1HA	Tenenat	Hindi-I		1	-	2	25	75	100	2
191TL1A1MA	Language-I	Malayalam-I	4			3	25	75	100	5
191TL1A1FA		French – I								
Part – II										
191EL1A1EA	Language-II	English – I	4	-	1	3	25	75	100	3
Part – III										
194CT1A1CA	Core-I	Problem solving using C Programming	4	1	-	3	25	75	100	4
192MT1A1ID	IDC-I	Discrete Mathematical Structures	4	1	-	3	25	75	100	4
194IT1A1CP	Core Practical-I	Programming in C	-	-	4	3	40	60	100	2
194IT1A1CQ	Core Practical-II	Office Automation and Multimedia Lab	-	-	4	3	40	60	100	2
Part - IV										
193MB1A1AA	AECC - I	Environmental Studies	2	-	-	3	-	50	50	2
Total			18	3	9	-	-	-	650	20



Course Code	Course	Course Name	т	т	Р	Exam (h)	Max Marks			Credits
Course Coue	Category	Course Munic	L	1			CIA	ESE	Total	Cleuits
Second Semester										
Part - I										
191TL1A2TA		Tamil-II								
191TL1A2HA	Languaga	Hindi-II	4	1		3	25	75	100	2
191TL1A2MA	Language-1	Malayalam-II	4	T	-		23	75	100	3
191TL1A2FA		French – II								
Part – II										
191EL1A2EA	Language-II	English – II	4	-	1	3	25	75	100	3
Part – III										
194CA1A2CA	Core- II	Data Structures	4	1	-	3	25	75	100	4
192MT1A2IC	IDC-II	Numerical Methods and Statistics	4	1	-	3	25	75	100	4
194CA1A2CP	Core Practical- III	Data Structures using C	-	-	4	3	40	60	100	2
194IT1A2CQ	Core Practical- IV	Open Source and Web Development	-	-	4	3	40	60	100	2
Part - IV	Part - IV									
196BM1A2AA	AECC - II	Human Rights	2	-	-	3	-	50	50	2
	•	Total	18	3	9	-	-	-	650	20



Course Code	Course	Course Name	т	т	ТР	Exam	Max Marks			Cradita
Course Code	Category	Course Maine	L	1	r	(h)	CIA	ESE	Total	Credits
Third Semester										
194IT1A3CA	Core - III	Java Programming	4	1	-	3	25	75	100	4
194CT1A3CA	Core - IV	Operating System	4	1	-	3	25	75	100	4
192PY1A3IA	IDC - III	Digital Electronics	4	-	-	3	25	75	100	4
194IT1A3CP	Core Practical - V	Network Programming using Java	-	-	4	3	40	60	100	2
194IT1A3SA	SEC- I	Internet Programming	4	-	-	3	25	75	100	4
194IT1A3SP	SEC Practical- I	Internet Programming	-	-	4	3	40	60	100	2
	GE- I		2	-	-	3	-	50	50	2
	LoP	Lab on Project	-	-	-	-	-	-	-	-
Part - IV	1			J			1		L	
191TL1A3AA		Basic Tamil	2	_	_	3	_	50	50	2
191TL1A3AB	AECC - III	Advanced Tamil								
195CR1A3AA	]	Women's Rights								
		Total	20	2	8	-	-	-	700	24

### EXTRA CREDIT COURSES

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

S. No.	Course Code	Course Name
1	194IT1ASSA	Ethical Hacking
2	194IT1ASSB	Network Protocols



Course Code	Course	Course Norme	т	т	р	Exam	Max Marks			Credit
Course Code	Category	Course Maine	L	I	r	( <b>h</b> )	CIA	ESE	Total	S
Fourth Semester	Fourth Semester									
Part – III										
194CS1A4CA	Core - V	Agile Methodology	4	1	-	3	25	75	100	4
194IT1A4CA	Core - VI	Relational Database Management System	4	1	-	3	25	75	100	4
195AT1A4IA	IDC - IV	Digital Marketing	4	-	-	3	25	75	100	4
194IT1A4CP	Core Practical - VI	Dot Net with RDBMS	-	-	4	3	40	60	100	2
194CS1A4SA	SEC- II	Python Programming	4	-	-	3	25	75	100	4
194IT1A4SP	SEC Practical- II	Programming in Python	-	-	4	3	40	60	100	2
	GE – II		2	-	-	3	-	50	50	2
	LoP	Lab on Project	-	-	-	-	-	-	-	-
Part - IV				•	•					
191TL1A4AA		Basic Tamil								
191TL1A4AB	AECC - IV	Advanced Tamil	2	-	-	3	-	50	50	2
192PY1A4AA		General Awareness								
		Total	20	2	8	-	-	-	700	24



Course Code	Course	Course Name L	т	т	тр	P Exam (h)	Max Marks			Cradita
Course Code	Category	Course Name	L	I	r		CIA	ESE	Total	Credits
Fifth Semester	Fifth Semester				•			•		
194CT1A5CA	Core - VII	Data Communication and Networks	4	-	-	3	25	75	100	4
194IT1A5CA	Core - VIII	Big Data Analytics	4	-	-	3	25	75	100	4
194IT1A5CB	Core -IX	Cyber Crime and Digital Forensic	4	-	-	3	25	75	100	4
194IT1A5CC	Core-X	Artificial Intelligence and Machine Learning	4	-	-	3	25	75	100	4
194IT1A5CP	Core Practical-VII	Data Analytics	-	-	4	3	40	60	100	2
194IT1A5CQ	Core Practical- VIII	Mobile Application Development	-	-	4	3	40	60	100	2
194IT1A5DA		5G Mobile Networks								
194IT1A5DB	DSE -I	Next Generation Database	4	-	-	3	25	75	100	4
194IT1A5DC		Deep Learning								
194IT1A5TA	IT	Industrial Training	Grade A to C							
194IT1A5LA	LoP	Lab on Project	-	-	-	-	50	-	50	1
Part - IV										
192MT1A5AA	AECC - V	Research Methodology	2	-	-	3	-	50	50	2
		Total	22	-	8	-	-	-	800	27



Course Code	Course	Course Name L	т	т	тр	Exam	Max Marks			Cradita
Course Code	Category	Course Name	L	I	r	(h)	CIA	ESE	Total	Credits
Sixth Semester										
194IT1A6CA	Core - XI	PHP and MYSQL	4	-	-	3	25	75	100	4
194IT1A6CB	Core - XII	Cloud Computing	4	-	-	3	25	75	100	4
194IT1A6CP	Core Practical -IX	PHP and MYSQL	ŀ	-	4	3	40	60	100	2
194IT1A6CV	Core - XIII Project	Project Work	-	-	8	3	40	60	100	4
194IT1A6DA		Software Testing								
194IT1A6DB	DSE -II	Augmented Reality and Virtual Reality	4	-	-	3	25	75	100	4
194 IT1A6DC		Robotics								
194IT1A6DD		Routing and Switching								
194IT1A6DE	DSE -III	Blockchain Technology	4	-	-	3	25	75	100	4
194IT1A6DF		Data Visualization								
Part - IV										
193BC1A6AA	AECC - VI	Innovation, IPR and Entrepreneurship	2	-	-	3	-	50	50	2
Part - V										
194IT1A6XA		Extension Activity	-	-	-	-	-	-	50	1
Total 18 - 12							700	25		
Grand Total										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.	194IT1A5DA	5G Mobile Networks
2.	194IT1A5DB	Next Generation Database
3.	194IT1A5DC	Deep Learning

#### Semester VI (Elective II)

#### List of Elective Courses

S. No.	Course Code	Name of the Course
1.	194IT1A6DA	Software Testing
2.	194IT1A6DB	Augmented Reality and Virtual Reality
3.	194IT1A6DC	Robotics

#### Semester VI (Elective III)

#### List of Elective Courses

S. No.	Course Code	Name of the Course
1.	194IT1A6DD	Routing and Switching
2.	194IT1A6DE	Blockchain Technology
3.	194IT1A6DF	Data Visualization



#### 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	194IT1A3GA	Internet of Things

#### Semester IV (GE-II)

S. No.	Course Code	Course Name
1	194IT1A4GA	Search Engine Optimization

#### EXTRA CREDIT COURSES

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

S. No.	Course Code	Course Name	
1	194IT1ASSA	Ethical Hacking	
2	194IT1ASSB	Network Protocols	

#### **CERTIFICATE PROGRAMMES**

#### The following are the programme offered to earn extra credits:

S. No.	Programme Code and Name	Course Code	Course Name
1	4IT5AA Bio-Python	194IT5A1CP	Bio-Python
2	4IT5AB Linux Foundation	194IT5B1CP	Linux Foundation



# MOOC (NPTEL/SWAYAM/ SPOKEN TUTORIAL)

The following are the online courses offered:

Please refer the following link to select the courses

www.swayam.org

www.nptel.ac.in

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: R**efers 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 skillbased and are aimed at providing hands-on-training, competencies, skills, etc.



e) Ability Enhancement Courses (AEC): AECC 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 Project work

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 Learners Course.



#### 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) Womens' 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.



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#### 2.5PART 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 ALLOTTMENT 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	



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#### 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 A SEMESTER

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



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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)	: <b>25</b> Marks
End Semester Exams (ESE)	: <b>75</b> Marks

### (ii) For Practical/ Courses

Continuous Internal Assessment (CIA)	: <b>40</b> Marks
End Semester Exams (ESE)	: <b>60</b> 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:
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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	I
	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.

# 6.1CONTINUOUS 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/
4	2	Assignment/ Class
6	3	presentation
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/ CLASS PRESENTATION

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:					Bran	ich:					Semes	ster:		-		
Course Code:				Cours	se:											
Max. Marks:			Internal: External:		Total:											
			THE	EORY/			RUB	RICS AS	SESSN	MENT (S	ELECT	ANY O	NE)			
		1	PRAC LIB CL PARTIC 15) (Co	FICAL RARY LASS CIPATI ompuls	& ON sory)	P. Ri	APERS EPORT (15)	S S	ASS	GIGNME (15)	NTS	C PRESH	CLASS ENTATIO (15)	NC	out of : 30	/10/08/04
S.No.	REG.NO	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	Total Marks (	Total Marks out of : 16
		6	3	3	3	5	5	5	5	5	5	5	5	5		
1																

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

S.No	For - UG Practical Courses	Dis	tribu	tion o	of Ma	rks	
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	А
60-74	В
40-59	С
< 40	Re-Appearance

# 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 40h.

### 8. EXTRA CREDITS

- 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 PracharSabha	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 and Games

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 Online Courses

Pass in any one of the online courses

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

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

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



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

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

# 8.11Representation

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



Course Code	Course Name	Category	L	Т	P	Credit
194CT1A1CA	PROBLEM SOLVING USING C PROGRAMMING	CORE	4	1	0	4

#### PREAMBLE

This course has been designed for students to learn and understand

- To help students develop the logic, ability to solve the problems efficiently using Cprogramming.
- To learn various concepts and techniques for problem solving and will implement those ideas using Cprograms.
- To impart the students, a platform to provide solution to real life problems which are moredynamic.

#### **COURSE OUTCOMES**

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

CO Number	CO Statement	Knowledge Level
CO1	Define the basic fundamentals of C Programming.	K1
CO2	Explain the principles of Control Structures and Arrays.	K2
CO3	Apply the knowledge of strings and functions.	K3
CO4	Build programs using structure, union and pointers.	K3
CO5	Demonstrate the concept of file management and Error handling.	K2

#### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	М	М	S	М
CO2	S	М	S	М	S
CO3	S	S	М	S	М
CO4	М	М	М	S	L
CO5	S	М	S	S	М
S Stror	ıg	M Medi	um	L Low	



#### Total Credits: 4 **Total Instructions Hours:** 60H

C

#### **Syllabus**

UnitI Program Development Style and Basicof C **10H** 

Programming Development Methodologies - Programming Style - Stepwise Refinement and Modularity - Problem Solving Techniques - Algorithm -Flowchart - Pseudo code - Sequence and Selection - Iteration and Recursion -Recursion Versus Iteration - Overview of Compilers and Interpreters - Structure of a C program – Programming Rules – Executing the Program

#### Unit II TheCDeclaration

Introduction - The C Character Set - C tokens -C Keywords and Identifiers -Constants - Variables - Data Types - Declaring Variables - Declaration of Storage Class –Defining Symbolic Constant.

Operator and Expressions : Arithmetic operators-Relational Operators-Logical **Operators-Assignment Operators-Increment and Decrement Operators-Conditional** Operators-Bitwise Operators-Special Operators-Precedence of Arithmetic Operators-- Type conversion in Expressions.

Managing Input and Output Operations: Reading a Character - Writing a Character – Formatted Input andOutput.

12H Unit III Decision Making Statements , ArraysandStrings

Decision Making and Branching: Introduction- Simple If Statement-The if.. else Statement-Nesting of if..else statements-Else if Ladder-The switch statement-the goto statement.

Decision Making and Looping: The while statement - the do statement- the for statement -jumps in loops.

Arrays: One Dimensional Arrays – Two Dimensional Arrays. Character arrays and strings: Declaring and Initializing String Variables – Reading Strings from Terminal - Writing Strings to Screen - String-handling Functions.

Unit IV Functions ,StructuresandUnions

User-defined Functions: Needs for User-defined Functions - Elements of Userdefined Functions - Definition of Functions - Return Values and their Types -Function Calls – Function Declaration – Category of Functions.

Structures and Unions: Defining a Structure – Declaring Structure Variables – Accessing Structure Members - Unions - Bit Fields.



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12H

#### **Unit V** Pointers and File Management

Pointers: Understanding Pointers – Accessing the Address of a Variable – Initialization of Pointer Variables – Accessing a Variable through its Pointer.

File Management: Defining and Opening a File – Closing a File – Input / Output operation on Files

#### **Text Books**

- 1 Ashok N. Kamthane, 2009, Programming and Data Structures, First Edition, Pearson Education (Unit I)
- 2 E. Balagurusamy, 2017, Programming in ANSI C, Seventh Edition, Tata McGraw Hall, New Delhi (Unit II to V)

#### References

- 1 ISRD Group, 2008, "Programming and Problem Solving Using C", Tata McGraw Hill
- 2 Hanly J R & Koffman E.B, 2009, "Problem Solving and Programme design in C", Pearson Education
- **3** Reema Thareja , 2015, "Programming in C", Second Edition, OXFORD University Press.
- 4 https://www.pdfdrive.com/c-for-dummies-2nd-edition-shranisi- e17843209.html



**14H** 

					2	.9
Course Code	Course Name	Category	L	Т	Р	Credit
192MT1A1ID	DISCRETE MATHEMATICAL STRUCTURES	IDC	4	1	0	4

#### PREAMBLE

This course has been designed for students to learn and understand

- The sets and their perations.
- The different types of graphs
- The groups and coding theory

#### **COURSE OUTCOMES**

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

CO Number	CO Statement	Knowledge Level
CO1	Describe the theory behind sets	K1
CO2	Explain the concept of relations and digraphs	K1
CO3	Describe the applications off functions and Boolean algebra	К2
CO4	Apply the concept of graph theory in network problems	К3
CO5	Employ the knowledge of group theory and coding theory	К3

#### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	М	М	S	М
CO2	S	М	S	М	S
CO3	S	S	S	S	М
CO4	М	М	S	S	L
CO5	S	М	М	S	М
S Stror	ıg	M Medi	um	L Low	



192MT1A1ID	IDC - DISCRETE MATHEMATICAL STRUCTURES	SEMESTER I
	Total Credits:	4
	Total Instructions Hours:	60H
	Syllabus	<b>10</b>

**UnitI** Sets and Logic

Sets and Subsets – Operations on sets –Sequences – Division in the integers – Matrices – Mathematical Structures - Propositions and Logical Operations – Conditional Statements – Methods of Proof – Mathematical Induction.

Relations and Digraphs	12H
	Relations and Digraphs

Product sets and Partitions – Relations and Digraphs – Paths in Relations and Digraphs – Properties of Relations – Equivalence Relations - Operations on Relations - Functions: Functions for computer Science – Permutation functions.

2 <b>H</b>
•

Partially ordered set- External Elements of partially ordered sets- Lattices- Finite Boolean Algebra - Functions on Boolean Algebras-Circuit Designs.

Unit IV Graph Theory

Graphs - Euler Paths and Circuits - Hamiltonian Paths and Circuits - Transport Network - Matching Problems - Coloring Graphs.

Unit V	Groups and Coding	12H
	1 0	

Coding of binary information and error detection – Decoding and Errorcorrection.

#### **Text Books**

- 1. Bernard Kolman, Robert C. Busby, Sharon Cutler Ross. (2002) Discrete Mathematical Structures, Edition IV, Prentice Hall of India (P)Ltd.
- 2. Kenneth Rosen, (2007) Discrete Mathematics and its Applications, McGraw Hill, NewDelhi.

#### References

- 1. J.P.Tremblay and R.Manohar, (2017) Discrete Mathematics Structures with its applications to Computer Science, McGraw Hill, NewDelhi.
- 2. Narsingh Deo, (19797), Graph Theory with its applications to Engineering and Computer Science, Prentice Hall of India (P)Ltd.



Dr.NGPASC

12H

12H

# SEMESTER - I

TotalCredits: 2

TotalInstructionsHours: 48H

#### S.No

#### List of Experiments

- 1. Program to implement operators
- 2. Program to implement branchingConditions
- 3. Program to demonstrate do and whileloop
- 4. Program to demonstrate forloop
- 5. Program to sort usingarrays
- 6. Program to implement Matrix Addition and Multiplication
- 7. Program to demonstrate string command witharrays
- 8. Program to demonstrate string commands withpointers
- 9. Program to implement recursivefunction
- 10. Program to use structure and array ofstructures
- 11. Program to use file manipulationcommands
- 12. Program to use command lineargument.

Note: Out of 12 Program, 10 Program mandatory



#### SEMESTER - I

TotalCredits: 2

TotalInstructionsHours: 48H

#### **List of Experiments**

- 1. Create a resume and format using MSWORD
- 2. Create a class time table using MSWORD
- 3. Prepare mail merge for parent meeting using MSWORD
- 4. Prepare Student mark sheet using MSEXCEL
- 5. Create a chart for result analysis using MSEXCEL

Prepare a mark list for following conditions using data filter and data sort in MS EXCEL

- a) Prepare mark list in ascendingorder.
- 6.

S.No

- b) Average is greater than or equal to60.
- c) Average is between 50 and 60.
- d) Average is below40
- Create a power point presentation to advertise a product using Slide 7.
  - Transition and Custom animation
- 8. Create a database to student's Mark sheet using MSAccess
- 9. Create a sales database of a company using MSAccess
- 10. Animate Plane flying in the Clouds usingPhotoshop
- 11. Create Plastic Surgery for the eyes, nose and mouth usingPhotoshop
- 12. Create a banner for thedepartment
- 13. Create a bouquet usingPhotoshop
- 14. Create a webpage usingPhotoshop
- 15. Design a certificate for an event usingPhotoshop

Note: Out of 15 Program, 10 Program mandatory

4

### PREAMBLE

This course has been designed for students to learn and understand

DATA STRUCTURES

- To remember algorithms and understand stack and queue •
- To understand the fundamentals of linked list, Searching and Sorting methods
- To analyze the tree and graph

# COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Apply and analyze various problems using stack & queue techniques	K1
CO2	Develop algorithms for linked list methods	K1,K2
CO3	Understand searching and sorting techniques	K1,K2,K3
CO4	Problem solving approaches in trees	K3
CO5	Understand graph and its applications	K3

# MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5
CO1	L	S	S	М	S
CO2	L	S	S	М	S
CO3	L	М	М	М	М
CO4	М	S	S	S	S
CO5	М	S	S	S	S
S	Strong	М	Medium	L	Low



# CORE

SEMESTER II

# Total Credits: 4

Total Instructions Hours: 60

#### Syllabus

Unit I Introduction : Algorithm, Array, Stack and Queue 10 H Introduction : History of Algorithm - Definition, Structure and properties of algorithm - Development of an algorithm - Data Structures and Algorithm - Data Structure Definition and Classification -Efficiency of Algorithm Array : Introduction - Representation of Array -Array Operations Stack : Stack operation - Evaluation of Expression: Infix to Postfix - Queue: Operation on Queue -Circular Queue Unit II Linked List 12 H Linked List: Singly Linked List- Circular Linked List - Doubly Linked List - Linked Stack and Queue: Implementation of Linked Representation- Operations on Linked Stack and Linked Queue -Polynomial Addition-Sparse Matrices Unit III Searching and Sorting 12 H Searching : Introduction - Linear Search - Binary Search Sorting : Introduction - Bubble Sort - Insertion Sort- Merge Sort- Quick Sort - Heap Sort Hashing : Introduction - Hash Table Structure - Hash Functions - Linear Open Addressing - Chaining-Directories Unit IV Trees 12 H Tree: Introduction - Definition and Basic Terminologies - Representation of Trees- Binary Tree -Representation of Binary Tree-Binary Tree Traversals-Threaded Binary Tree Binary Search Tree: Definition and Operations- AVL Tree Definition and Operations Unit V 14 H Graph

Graph : Introduction - Definition and Basic Terminologies - Representation of Graphs - Graph Traversals - Applications : Minimum Cost Spanning Tree - Shortest Path



Text Books

1	G A Vijayalakshmi Pai , 2008, Data Structures and Algorithms, First Edition, Tata McGraw Hill, New Delhi
2	Ellis Horowitz, Sartaj Shani, 2010, "Data and File Structures", Galgotia Publication

**Reference Books** 

1	Horowitz, Shani, Anderson - Freed Fundamentals of Data Structures in C [2nd Edition] Universities Press
2	Malik.D.S, 2003, Data structures using C++, First Edition, Cengage learning
3	Vaugha H. Patil, 2012, Data Structures Using C++, First Edition, Oxford Higher Education



#### PREAMBLE

This course has been designed for students to learn and understand

- To solve Simultaneous Linear Algebraic Equations •
- To enhance student knowledge in Measures of central tendency and dispersion
- To know about Statistical Inference.

### COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn about Linear Algebraic Equations	K1
CO2	Know the concept of numerical Differentiation and Numerical Integration	K2
CO3	Use measures of central tendency and Variation for Statistical Analysis	K2
CO4	Explore the relation between the variable using Correlation and Regression Analysis	K3
CO5	Gain knowledge to solve problems in Testing Hypothesis	K3

#### MAPPING WITH PROGRAMME OUTCOMES

COs	PO1	PO2	PO3	PO4	PO5
			<u> </u>		
CO1	S	M	S	M	M
CO2	S	М	S	М	S
CO3	М	S	S	S	М
CO4	М	М	S	S	S
CO5	S	S	S	S	S
S	Strong	М	Medium	L	Low


# 192MT1A2IC

Total Credits: 4

SEMESTER II

Total Instructions Hours: 60

# Syllabus

Unit ISimultaneous Linear Algebraic Equations10 HIntroduction - Gauss Elimination Method - Gauss Jordan Method - Iterative

Methods: Jacobi Method of Iteration - Gauss Seidel Iteration Method.

Unit IINumerical Differentiation and Integration12 H

Numerical Differentiation: Derivatives using Newton's forward difference formula - Derivatives using Newton's Backward difference formula

Numerical Integration: Trapezoidal Rule - Simpson's 1/3 rule - Simpson's 3/8 rule.

Unit IIIMeasures of Central Value and Measures of Dispersion12 H

Measures of central Value: Introduction – Types of Averages: Arithmetic Mean – Median – Mode. Measures of dispersion: The Inter quartile range or the Quartile Deviation – The Standard Deviation.

Unit IVCorrelation Analysis and Regression Analysis12 H

Correlation Analysis: Introduction - Types of Correlation – Methods of studying Correlation: Scatter diagram Method- Karl Pearson's coefficient of Correlation: Direct method of finding out correlation coefficient – Rank Correlation coefficient: Features of Spearman's correlation coefficient. Regression Analysis: Introduction -Regression Lines – Regression equations : Regression equation of Y on X -Regression equation of X on Y.

Unit V Statistical Inference

Test of Significance for Small Samples: Student t-Distribution-Test the Significance of the Mean of a Random Sample-Testing Difference between Means of Two Samples(Independent Samples)-Simple problems -Chi-Square Defined-Degrees of Freedom



## Text Books

1	Gupta. S.P., 2017 ,Statistical Methods, Forty fifth revised edition. Sultan Chand and Sons
2	Vedamurthy. V. N. Iyengar N.Ch.S.N , 2015, Numerical Methods, Vikas Publishing House Pvt Ltd,Noida

# **Reference Books**

1	Das.N.G, 2017, Statistical Methods Combined Edition (Volume I and Volume II). Forty fifth revised edition McCrew Hill Education (I) But I td
	II), FORTY III II TEVISEU EURION. MCGIAW THII EUUCAUOII(I) FVT LIU
2	Gupta, S.P. and Gupta, M.P. 2002. Business Statistics . Sultan Chand and
-	Sons
3	Venkataraman , M.K. 2004. Numerical Methods in science & Engineering .
5	Revised Edition NPC
4	Beri.G.C,2010.Third Edition, Business Statistics, McGraw Hill Education Pvt.
1	Ltd, Chennai
	VeerarajanT, Ramachandran. T.2004. Theory and Problems in Numerical
5	Methods With Programs in C and C++, Tata Mc-Graw Hill Publishing
	Company Limited, NewDelhi



S.No

**SEMESTER - II** 

Total Credits: 2

Total Instructions Hours: 48

# List of Experiments

- 1 C program to implement a STACK using array.
- 2 C program to implement Queue using array.
- 3 C program to convert infix expression into postfix expression.
- 4 C program to implement Stack as single linked list
- 5 C program to implement Queue as double linked list
- 6 C program to implement Binary Search.
- 7 C program to implement Insertion sort.
- 8 C program to implement Merge Sort
- 9 C program to implement Quick sort.
- 10 C program to implement Hashing.
- 11 C program to implement tree traversal
- 12 Write C programs for implementing the following graph traversal algorithms: a)Depth first traversal b)Breadth first traversal

Note: Out of 12 Program, 10 Program mandatory



TotalCredits: 2

## TotalInstructionsHours: 48H

#### S.No

#### List of Experiments

- 1. Creating and executing a bash program.
- 2. Check whether the given number is prime or not.
- 3. Create a D-shape pattern in BASH programming.
- 4. Write a program to generate Fibonacci Series.
- 5. Write a program to prepare electric bill for domestic consumers.

For first 100 UNIT s - Rs.0.75/ UNIT

For next 100 UNIT s - Rs.1.50/UNIT

Above 200 UNIT s - Rs.3.00/UNIT

Prepare the bill for the following format:

Customer No, Customer Name, Pre. Reading, Cur. Reading UNIT s

Consumed, Charge, Signature

6. Write a program to display the result PASS or FAIL using the information given below:

Student Name, Student Reg. No., Mark1, Mark2, Mark3, Mark4.

The minimum pass for each subject is 50.

- 7. Using Case Statement, write a program to check the files ending with vowels.
- 8. Write a single program to sort the names and numbers in alphabetical, ascending and descending order.
- 9. Write a menu driven program to print Biodata for five persons.
- 10. Write a program to prepare MCQ online Test.
- 11. Design HTML web page using standard HTML tags.
- 12. Program to work with various attributes of standard HTML elements.
- 13. Program to Display food menu using XMl.
- 14. Program to validate username and password using JavaScript.
- 15. Program to import CSS design for a webpage.

Note: Out of 15 Program, 10 Program mandatory



Course Code	Course Name	Category	L	Т	Р	Credit
191TL1A2TA	தமிழ்த்தாள் - II	Theory	4	1	-	3

This course has been designed for students to learn and understand

- மொழிப் பாடங்களின் வாயிலாக 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, K6

# MAPPING WITH PROGRAMME OUTCOMES

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



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191TL1A2TA	<b>தமிழ்த்தாள்</b> - II	SEMESTER II
	Total Total Instruction	<b>Credits:</b> 3 <b>h Hours:</b> 60 h
	Syllabus	
Unit I ม	ற இலக்கியம்	12 h
1. திருக்குறள்		
அ.அறன் வல	பியுறுத்தல் (அ. எண்: 04)	
ஆ.நட்பாராய்	தல் (அ. எண்: 80)	
இ.சான்றாண்	மை (அ. எண்: 99)	
ஈ.குறிப்பறித	ல் (அ. எண்: 110)	
2. மூதுரை - ஒல	ளவையார் (10 பாடல்கள் - 6,7,9,10,14,16,17,23,26,30)	
Unit II ୬	ற இலக்கியம்	10 h
1. நாலடியார்	- அறிவுடைமை	
2.பழமொழி நான	றூறு - வீட்டு நெறி	
3. கார்நாற்பது	- தோழி பருவங்காட்டி தலைமகளை வற்புறுத்திய பாட	டல்கள்
	(1முதல் – 18பாடல்கள் )	
Unit III உ	ரைநடை	10 h
1. பெற்றோர்ப் ே	பணல் - திரு.வி.க.	
2. உள்ளம் குளிர்	ந்தது - மு.வரதராசனார்	
3. சங்கநெறிகள்	- வ.சுப.மாணிக்கம்	
Unit IV உ	ரைநடை	13 h
1.பெரியார் உணர்	ர்த்தும் சுயமரியாதையும் சமதர்மமும் - வே. ஆனைமுத்து	
2. வீரவணக்கம்	- கைலாசபதி	
3.மொழியும்நில(	ழம் - எஸ். ராமகிருஷ்னண்	
Unit V 🛛 🕲	லக்கிய வரலாறு, இலக்கணம் மற்றும் பயிற்சிப்பகுதி	15 h
அ.இலக்கிய வர	லாறு	
1. பதினெண் கீழ்	க்கணக்கு நூல்கள்	
2. தமிழ் உரைந	டையின் தோற்றமும் வளர்ச்சியும்	
ஆ. இலக்கணம்		
1. வழு, வழுவன	ம்றதி, வழாநிலை –	
இ. பயிற்சிப்பகுதி	ji மற்றும் சிரைச்சுதை சினையும்ப	
். நூல் மதாப்படு 2. கன்விவாக் கு	யற்றும் தாலர்கையைத் தாற்னாயவு றிப்ப எழுதுகல்	



#### **Text Books**

தொகுப்பு: தமிழ்த்துறை, டாக்டர் என்.ஜி.பி. கலை மற்றும் அறிவியல் கல்லூரி

1 (தன்னாட்சி) செய்யுள் மற்றும் உரைநடைத் திரட்டு. (முதல்பதிப்பு.) சென்னை: நியூ செஞ்சுரி புக்ஹவுஸ் (பி) லிட்.

### References

- பேராசிரியர் புலவர் இளவரசு, சோம. (ஜூலை2012). தமிழ் இலக்கிய வரலாறு.
  - (எட்டாம் பதிப்பு) சென்னை: மணிவாசகர் பதிப்பகம்.
- பேராசிரியர் முனைவர் பாக்கியமேரி (2013). இலக்கணம் இலக்கிய வரலாறு

   வாழித்திறன். (முதல் பதிப்பு) சென்னை பூவேந்தன் பதிப்பகம்.
- 3 தமிழ் இணையக் கல்விக்கழகம் <http://www.tamilvu.org/>



Course Code	Course Name	Category	L	Т	Р	Credit
191TL1A2HA	HINDI-II	Theory	4	1	-	3

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	М	М	М	S
CO2	S	М	М	М	S
CO3	S	М	М	М	S
CO4	S	М	S	М	S
CO5	S	М	S	М	S
S Strong M Medium L Low					



191TL1A2HA	HINDI-II	SEMESTER II
	Total Total Instruction	Credits: 3
	Syllabus	
Unit I		15 h
आधुनिकपद्य – शबरी(	श्रीनरेशमेहता)	
प्रकाशक: लोकभारतीप्रक	ाशन	
पहलीमंजिल, दरबारीबिति	डंग,	
महात्मागाँधीमार्ग, इलाह	ाबाद-211001	
Unit II		15 h
उपन्यास: सेवासदन-प्रेम	वन्द	
प्रकाशक: सु मत्रप्रकाशन		
204 लीलाअपार्ट्मेंट्स,	15 हेस्टिंग्सरोड'	
अशोकनगरइलाहाबाद-2	1001	
Unit III		15 h
अनुवादअभ्यास-III (केव	लहिन्दीसेअंग्रेजीमें)	
(ਧਾਠ1 to 10)		
प्रकाशक: द क्षणभारतप्र	गरसभाचेनैई-17	
Unit IV		15 h





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Course Code	Course Name	Category	L	Т	Р	Credit
191TL1A2MA	MALAYALAM-II PROSE: NON-FICTION	Theory	4	1	-	3

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	К3
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	М	М	М	S
CO2	S	М	М	М	S
CO3	S	М	S	М	S
CO4	S	М	S	М	S
CO5	S	М	S	М	S
S Stroi	ng	M Medi	um	L Low	



191TL1A2MA	MALAYALAM-II PROSE: NON-FICTION	SEMES	TER II
	Total Total Instruction	Credits: Hours:	3 60 h
	Syllabus		
Unit I			12 h
Biography			
Unit II			12 h
Biography			
Unit III			12 h
Travelogue			
Unit IV			12 h
Travelogue			
Unit V			12 h
Travelogue			

# Text Books

- 1 Unit III, IV &V:Pottakkadu,S.K. KappirikaludeNattil. Kottayam: D.C. Books.
- **2** Bhatathirippadu,V.T.KannerumKinavum. Kottayam: D.C. Books.

# References

- 1 Dr. George,K.M.(). Jeevacharitrasahithyam. (Edn.) Kottayam: N.B.S.
- 2 Dr. NaduvattomGopalakrishnan.JeevacharitrasahithyamMalayalathil. Trivandrum:Kerala BhashaInstitute.
- **3** Dr. VijayalamJayakumar. AthmakathasahithyamMalayalathil. (Kottayam:N.B.S.
- 4 Prof. Ramesh Chandran.SancharasahithyamMalayalathil. (10 Edn.) Trivandrum: Kerala Bhasha Institute.



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Course Code	Course Name	Category	L	Т	Р	Credit
191TL1A2FA	FRENCH- II	Theory	4	1	-	3

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	М	М	М	S
CO2	S	М	М	М	S
CO3	S	М	S	М	S
CO4	S	М	S	М	S
CO5	S	М	S	М	S
S Stroi	ng	M Medi	um	L Low	



13 h

#### **Total Credits:** 3

#### Total Instruction Hours: 60 h

#### Syllabus

Unit I – Super!

• Compétenc e Culturelle

L'égalitéhomme/femme

Compétence De communication

**INTERACTION:** 

Exprimer des sentiments, exprimer la joie, le plaisir, le bonheur

• RÉCEPTION ORALE:

Comprendre un jeuradiophonique

• RÉCEPTION ÉCRITE:

Comprendre des announces

• PRODUCTION ÉCRITE:

Écrire des cartespostales •

Compétencegrammaticale

Les noms de professions masculine/feminine

• Le verb finir et less

Verbes du groupe

en-ir

- Le present de l'impératif
- Savoir(present)
- Le participle passé:

Fini, aimé, arrive, dit,écrit

• Quel(s), quelle(s)..:

InterrogatifetExclamatif

- À + infinitive
- Les articles: n,une,des

Unit II Quoi?

Compétenc e Culturelle

Ler 20 BASCI e:

Petitsprogrés Grand progrés

Compétence De communication

• INTERACTION:

Decrirequelque chose, unepersonne

• RECEPTION ORALE:

Comprendre un message publicitaire

• RÉCEPTION ÉCRITE:

Comprendre un déplianttouristique

PRODUCTION

ÉCRITE: Écrire des petites announces

Compétence grammatical

- On
- Plus, moins
- Le verbealler:
- Present, impératif
- Aller + infinitife
- Le pluriel en -x

**Unit III** – Et aprés

Compétenc e Culturelle

Nouvelles du jour

Compétence De communication

INTERACTION:

Raconteur, situer un récitdans le temps

RÉCEPTION ORALE:

Comprendreune description

RÉCEPTION ÉCRITE:

Comprendre un test

PRODUCTION ÉCRITE:

écrire des cartespostales

Compétencegrammaticale

L'imparfait:: quel-Ques forms pour introduire le récit:Ilfaisait, il y avait, ilÉtait

Un peu, beaucoup, trop,Assez

Trés



12 h

Présent, impératif En Suisse, auMaroc, aux Etats-Unis

Unit IV Maisoui! Compétenc e Culturelle La génération des20-30 ans Compétence De communication **INTERACTION:** Donner son opinion, Expliquerpourquoi **RÉCEPTION ORALE:** Comprendre des informations à la radio **RÉCEPTION ÉCRITE:** Comprendre un texteinformatif **PRODUCTION ÉCRITE:** éncrire un mél de protestation Compétencegrammaticale Répondre, prendre: Présent, impératif, part Passé Parcequepourquoi Tout/tous, toute/s Tous/toutes les... (répétition action) Unit V Maisnon! Compétenc e Culturelle De la ville à la campagne Compétence De communication **INTERACTION:** Débat:: exprimerl'accord, exprimer le Désaccord **RECEPTION ORALE:** Comprendre un message sur un répondeurtéléphonique **RÉCEPTION ÉCRITE:** Comprendre un témoignage

PRODUCTION ECRITE: Rediger des petites Announces immobilieres



Dr.NGPASC



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Compétencegrammaticale Le verbedevoir:Present et participe passé Le verbe vivre, present Aller + infinitive Venir+ infinitive Etre pour/contre

# **Text Books**

1 Marcella Di Giura Jean-Claude Beacco, AlorsINew Delhi – 110007:Goyal Publishers Pvt Ltd86, University Block Jawahar Nagar (Kamla Nagar).



Course Code	Course Name	Category	L	Т	Р	Credit
191EL1A2EA	ENGLISH - II	Language - II	4	0	1	3

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 genres
- 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	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	K4
CO4	Inspect the knowledge to the corporate needs	K4
CO5	Formulate Inter and Intrapersonal skills	K6

# MAPPING WITH PROGRAMME OUTCOMES

Μ

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	S	S	М	М	S
CO2	S	S	S	S	S
CO3	М	S	S	S	М
CO4	S	S	М	S	М
CO5	S	S	S	S	М
S	Strong	М	Madium	т	Low

Medium



Strong

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Low

L

#### **Total Credits:** 3 **Total Instructions Hours:** 60

#### Syllabus

#### Unit I Technical English

Communication: Process- Methods- Channels- Barriers of Communications

Phonetics: Basics of phonetics - Consonants and Vowel sounds - Pronunciation Guidelines- Problem Sounds and Differences in Pronunciation

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

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

#### Unit II Business English

Structure and Planning of Letters: Elements of Structure- Forms of Layout- Style-Importance and Steps for Planning- 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

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

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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



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10

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# Unit V Soft Skills

Self - Discovery and Goal Setting: Self - Discovery - What Comprises It?- Goals and Types- Benefits, Areas and Clarity of Goal Setting - Critical thinking

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: Nature and Characteristics- Objectives and Significance

Developing Emotional Intelligence (EI): Salient Features- Components of EI-Intrapersonal Development

# Text Books

- 1 Prabha, Dr. R. Vithya & S. Nithya Devi. 2019. Sparkle. (1st Edn.) McGraw -Hill Education. Chennai.
- 2 Rizvi, Ashraf. M. 2018. Effective Technical Communication. McGraw Hill Education, Chennai.

#### 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.
- 5 Sharma, R.C. and Krishna Mohan. 2016. Business Correspondence and Report Writing. 5th Edn. McGraw - Hill Education, Chennai.



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Course Code	Course Name	Category	L	Т	Р	Credit
194CA1A2CA	DATA STRUCTURES	CORE	4	1	-	4

This course has been designed for students to learn and understand

- To remember algorithms and understand stack and queue
- To understand the fundamentals of linked list, Searching and Sorting methods
- To analyze the tree and graph

### **COURSE OUTCOMES**

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

CO Number	CO Statement	Knowledge Level
CO1	Apply and analyze various problems using stack & queue techniques	K1
CO2	Develop algorithms for linked list methods	K1,K2
CO3	Understand searching and sorting techniques	K1,K2,K3
CO4	Problem solving approaches in trees	K3
CO5	Understand graph and its applications	K3

# MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	L	М	S	L	М
CO2	L	S	S	L	М
CO3	L	S	S	L	М
CO4	L	М	S	L	S
CO5	М	М	S	М	S
S Stroi	ng	M Medi	um	L Low	



# Total Credits: 4

#### Total Instruction Hours: 60 h

#### Syllabus

<b>Unit I</b> Introduction : Algorithm, Array, Stack and Queue
--

Introduction : History of Algorithm - Definition, Structure and properties of algorithm - Development of an algorithm - Data Structures and Algorithm - Data Structure Definition and Classification - Efficiency of Algorithm

Array : Introduction - Representation of Array -Array Operations

Stack : Stack operation - Evaluation of Expression: Infix to Postfix - Queue: Operation on Queue - Circular Queue

Unit II	Linked List	12 ŀ
Unit II	Linkea List	12

Linked List: Singly Linked List- Circular Linked List - Doubly Linked List - Linked Stack and Queue: Implementation of Linked Representation- Operations on Linked Stack and Linked Queue - Polynomial Addition- Sparse Matrices

**Unit III** Searching and Sorting

Searching : Introduction - Linear Search - Binary Search

Sorting : Introduction - Bubble Sort - Insertion Sort- Merge Sort- Quick Sort - Heap Sort

Hashing : Introduction - Hash Table Structure - Hash Functions - Linear Open Addressing - Chaining-Directories

Unit IV	Trees	

Tree: Introduction - Definition and Basic Terminologies - Representation of Trees-Binary Tree -

Representation of Binary Tree-Binary Tree Traversals-Threaded Binary Tree

Binary Search Tree: Definition and Operations- AVL Tree Definition and Operations

Unit V Graph

Graph : Introduction - Definition and Basic Terminologies - Representation of Graphs - Graph Traversals - Applications : Minimum Cost Spanning Tree - Shortest Path



12 h

12 h

14 h

# Text Books

- 1 G A Vijayalakshmi Pai, (2008). Data Structures and Algorithms. (First Edition Edn.) : Tata McGraw Hill, New Delhi.
- 2 Ellis Horowitz, Sartaj Shani. (2010). Data and File Structures. (Galgotia Publication.

# References

- 1 Horowitz, Shani. (Anderson Freed). Fundamentals of Data Structures inC. (2nd Edn.) : Universities Press.
- 2 Malik.D.S , (2003). Data structures using C++. (First Edn.) : Cengage learning.
- **3** Vaugha H. Patil, (2012). Data Structures Using C++. (First Edn.) : Oxford Higher Education.



Course Code	Course Name	Category	L	Т	Р	Credit
192MT1A2IC	IDC:NUMERICAL METHODS AND STATISTICS	IDC	4	1	-	4

This course has been designed for students to learn and understand

- To solve Simultaneous Linear Algebraic Equations •
- To enhance student knowledge in Measures of central tendency and • dispersion
- To know about Test of Significance and Chi-Square Test

#### **COURSE OUTCOMES**

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

CO Number	CO Statement	Knowledge Level
CO1	Learn about Linear Algebraic Equations	K1
CO2	Discuss the concept of numerical Differentiation and Numerical Integration.	K2
CO3	Use measures of central tendency and Variation for Statistical Analysis	К3
CO4	Demonstrate the relation between the variables using Correlation and Regression Analysis	К3
CO5	Analyzing the concept of Test of Significance	K4

#### MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5	
CO1	S	М	S	М	М	
CO2	S	М	S	М	S	
CO3	М	S	S	S	М	
CO4	М	М	S	S	S	
CO5	S	S	S	S	S	
S Stro	S Strong M Medium L Low					

Strong

Mealum

LUW



#### **Total Credits:** 4

#### Total Instruction Hours: 60 h

#### **Syllabus**

Unit I	Simultaneous Linear Algebraic Equations	10 h				
Introduction – Gauss Elimination Method – Gauss Jordan Method – Iterative Methods - Jacobi Method of Iteration – Gauss Seidel Iteration Method						
Unit II	Numerical Differentiation and Integration	12 h				
Numerical Differentiation - Derivatives using Newton's forward difference formula - Derivatives using Newton's Backward difference formula - Numerical Integration - Trapezoidal Rule - Simpson's 1/3 rd rule - Simpson's 3/8 th rule						
Unit III	Measures of Central Tendency and Dispersion	12 h				
Function of an Average - Characteristics of Typical Average - Limitations -Properties - Mean - Calculation of Mean - Merits of - Mean - Demerits of Mean - Median -						

Calculation of Median - Merits of Median - Demerits of Median - Mode - Calculation of Mode - Merits of Mode - Demerits of Mode - Range - Quartile Deviation – Standard Deviation

Unit IVCorrelation and Regression12 h

Types of Correlation – Scatter diagram Method - Coefficient of Correlation - Karl Pearson's Coefficient of Correlation - Merits and Demerits of Correlation – Rank Correlation - Regression - Uses - Difference between Correlation and Regression -Method of Studying Regression – Regression Equations - Regression equation of Y on X - Regression equation of X on Y

<b>Unit V</b> Test of Significance and Chi-Square Test	14 h
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Testing of Hypothesis - Standard Error - Test of Significance for Attributes - Test for Proportion of Success - Test for Difference in Proportions - Test of Significance for Large Samples - The Standard error of mean - Testing the difference between means of Two Samples - Test of Significance for Small Samples - Students' t- Distribution -Chi Square Test - Characteristics of Chi Square Test - Degree of Freedom - Chi Square Test of goodness of fit - Chi Square as a test of independence



# Text Books

- Pillai R.S.N and Bagavathi, (2002). Statistical Methods. (14th Edn.) New Delhi:
   S. Chand and Company Ltd.
- Vedamurthy V.N, Iyengar N.Ch.S.N, (2015). Numerical Methods. (1st Edn.) Noida:Vikas Publishing House.

# References

- 1 Gupta S.P, Gupta M.P, (2002). Business Staitistics. (17th Edn.) :Sultan Chand and Sons.
- 2 Beri.,G.C (2010). Business Statistics. (3rd Edn.) New Delhi: McGraw Hill Education Pvt. Ltd.
- **3** Venkataraman, M.K. (2004). Numerical Methods in Science and Engineering. (4th Edn.) :NPC.

Veerarajan.T,Ramachandran.T,. (2004). Theory and Problems in Numerical

4 Methods With Programs in C and C++. (10th Edn.) New Delhi: Tata Mc-Graw Hill Publishing Company Limited .



# CORE PRACTICAL: DATA STRUCTURES USING C

# SEMESTER II

# Total Credits:2Total Instructions Hours:48 h

S.No	List of Experiments
1	C program to implement a STACK using array.
2	C program to implement Queue using array.
3	C program to convert infix expression into postfix expression.
4	C program to implement Stack as single linked list
5	C program to implement Queue as double linked list
6	C program to implement Binary Search.
7	C program to implement Insertion sort.
8	C program to implement Merge Sort
9	C program to implement Quick sort.
10	C program to implement Hashing.
11	C program to implement tree traversal.
12	Write C programs for implementing the following graph traversal algorithms: a)Depth first traversal b)Breadth first traversal.

Note: Out of 12 Experiments, 10 Experiments are mandatory



# CORE PRACTICAL: OPEN SOURCE AND WEB DEVELOPMENT

# Total Credits:2Total Instructions Hours:48 h

S.No	List of Experiments
1	Creating and executing a bash program
2	Check whether the given number is prime or not.
3	Create a D-shape pattern in BASH programming.
4	Write a program to generate Fibonacci Series.
5	<ul> <li>Write a program to prepare electric bill for domestic consumers.</li> <li>For first 100 UNIT s - Rs.0.75/ UNIT</li> <li>For next 100 UNIT s - Rs.1.50/UNIT</li> <li>Above 200 UNIT s - Rs.3.00/UNIT</li> <li>Prepare the bill for the following format:</li> <li>Customer No, Customer Name, Pre. Reading, Cur. Reading UNITs</li> <li>Consumed, Charge, Signature</li> </ul>
6	Write a program to display the result PASS or FAIL using the information given below:
	Student Name, Student Reg. No., Mark1, Mark2, Mark3, Mark4.
	The minimum pass for each subject is 50
7	Using Case Statement, write a program to check the files ending with vowels
8	Write a single program to sort the names and numbers in alphabetical, ascending and descending order.
9	Write a menu driven program to print Bio data for five persons
10	Write a program to prepare MCQ online Test.
11	Design HTML web page using standard HTML tags.
12	Program to work with various attributes of standard HTML elements.
13	Program to Display food menu using XML.
14	Program to validate username and password using JavaScript.
15	Program to import CSS design for a webpage.
_	



Course Code	Course Name	Category	L	Т	Р	Credit
196BM1A2AA	AECC : HUMAN RIGHTS	AECC	2	-	-	2

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.	К3

#### MAPPING WITH PROGRAMME OUTCOMES

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

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Medium B.Sc. (IT) (Students admitted during the AY 2019-20)

# 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

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

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 05 h Human Rights and Rights of Women and Children

Human Rights - Concept of Human Rights - Indian and International Perspectives Eunderson of Human Rights - Definitions (17) Shatent Indiand and the Apparizonal COIMBATORE | INDIA



05 h

05 h

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 Redressel 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 Dasaus Ltd



Course Code	Course Category Course Name	Course Name	т	т	D	Exam	Max Marks			Creadita
		L	1	P	(h)	CIA	ESE	Total	Cleuns	
Third Semester	Third Semester									
194IT1A3CA	Core - III	Java Programming	4	1	-	3	25	75	100	4
194CT1A3CA	Core - IV	Operating System	4	1	-	3	25	75	100	4
192PY1A3IA	IDC - III	Digital Electronics	4	-	-	3	25	75	100	4
194IT1A3CP	Core Practical - V	Network Programming using Java	-	-	4	3	40	60	100	2
194IT1A3SA	SEC- I	Internet Programming	4	-	-	3	25	75	100	4
194IT1A3SP	SEC Practical- I	Internet Programming	-	-	4	3	40	60	100	2
	GE- I		2	-	-	3	-	50	50	2
	LoP - I	Lab on Project	-	-	-	-	-	-	-	-
Part - IV			1						I	
191TL1A3AA		Basic Tamil	2	_	_	3	_	50	50	2
191TL1A3AB	AECC - III	Advanced Tamil				0		00	00	_
195CR1A3AA		Women's Rights								
Total			20	2	8	-	-	-	700	24

#### EXTRA CREDIT COURSES

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

S. No.	Course Code	Course Name
1	194IT1ASSA	Ethical Hacking
2	194IT1ASSB	Network Protocols

Course Code	Course Name	Category	L	T	Р	Credit
194IT1A3CA	JAVA PROGRAMMING	CORE	4	1	-	4

This course has been designed for students to learn and understand

- Object-oriented paradigm in the Java programming language.
- Event -driven programming methods.
- The special and unique features of java programming.

### **COURSE OUTCOMES**

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

CO Number	CO Statement	Knowledge Level
CO1	Define the basic fundamentals of Java Programming.	K1
CO2	Learn about Object-oriented programming concepts.	K2
CO3	Apply the knowledge in java packages, Threads and Strings	К3
CO4	Demonstrate the concept of JDBC and RMI	K3
CO5	Building programs to develop rich internet applications using JavaFX	К3

# MAPPING WITH PROGRAMME OUTCOMES

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



#### **Total Credits:** 4

**SEMESTER III** 

#### Total Instruction Hours: 60 h

#### Syllabus

#### Unit I Object Oriented Concepts

Introduction to Object-Oriented Programming – The Java language – Variable Declarations and Arrays – Operators in Java. Control Statements: Introduction – Selection Constructs – Iteration Constructs – Jump Constructs. Introduction to Classes: Instance variables – Class variables – Instance Methods – Constructors – Class Methods – Declaring Objects – Singleton pattern.

#### Unit II Classes and Methods

Classes and Methods :Method Overloading – Constructor Overloading – This Reference – Using Objects in Method – Recursion – Access Modifiers – Inner Classes – Command Line Arguments. Inheritance: Basics of Inheritance – Super Class Variable and Subclass Object – The super reference – Constructor Chaining – Method Overriding – The final Keyword. The abstract Classes and Methods – Defining Interface – Implementing Interfaces – Extending Interface – Interface Reference – JNI.

**Unit III** Exception Handling, Multithreading, Packages and Strings 12 h

Exception Handling: Types of Exceptions-Uncaught Exceptions – Handling Exceptions – User Defined. Multithreaded Programming: Concept of Threads – Thread Creation – Thread's Life Cycle – Thread Scheduling. Packages – An Introduction – The package Declaration – The import Statement – Illustration Package – The Java Language Packages. Handling Strings: Creating Strings – Operations on Strings – Character Extractor Methods – String Comparison Methods.

#### **Unit IV** I/O Operations, JDBC and RMI

Input and Output Operations – Hierarchy of classes in java.io Package – File class – Input Stream and Output Stream-Random Access File Class. JDBC: Architecture-JDBC-ODBC-Types of Drivers- components-Interfaces and classes-Steps for querying the database with JDBC-Creating ODBC Data Source-Querying and Updating Database tables. RMI: How RMI Works-RMI Process- Implementing RMI Services-Executing RMI Client and Server.

#### **Unit V** JavaFX

JavaFX: Introduction – History - Environment - Architecture – Application - Shapes – Text – Effects – Transformation- Animations – Colors – Images – User Interface Ols.NGCharts – CSS – Layout Panes - Media with JavaFx – Event handling with B.Sc. (IT) (Students admitted during the AY 2019-20)

X. COIMBATORE | INDIA



12 h

12 h

12 h

12 h

# **Text Books**

Instructional Software Research and Development (ISRD) Group, 2007,

- 1 "Introduction to Object Oriented Programming through Java", Tata McGraw-Hill Publishing Company Limited, New Delhi.
- 2 Kishori Sharan, 2015, "Learn JavaFx Builiding User Experiences and Interfaces with Java 8", Apress

# References

4

- 1 E.Balaguruswamy, 2010, "Programming with Java A Primer", Second Edition, Tata McGraw Hill Publications.
- 2 Schildt, 2010, "The Complete Reference Java", Eighth Edition, Tata McGraw Hill Publications.
- 3 C. Xavier, 2010, "Programming with JAVA 2", SciTech Publication, Chennai

Paul deitel and Harvey Deitel, 2015, "Java How to Program, 10/E", 10th Edition, Deitel& Associates, Inc Publications



Course Code	Course Name	Category	L	Т	Р	Credit
194CT1A3CA	<b>OPERATING SYSTEM</b>	CORE	4	1	-	4

This course has been designed for students to learn and understand

- The Evolution of OS functions and process
- The Process scheduling and deadlock techniques
- The concept of memory and storage management

### **COURSE OUTCOMES**

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the evolution of OS functions and process	K1
CO2	Learn Process scheduling	K1,K2
CO3	Understand deadlock techniques	K2, K3
CO4	Acquire knowledge on memory management	K3
CO5	Learn mass storage structure.	K3

## MAPPING WITH PROGRAMME OUTCOMES

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



# Total Credits: 4

SEMESTER III

# Total Instruction Hours: 60 h

#### **Syllabus**

12 h Unit I Introduction to Operating Systems

Introduction: What Operating Systems do - Computer System Organization -Computer System Architecture - Operating System Structure - Distributed Systems - Special Purpose Systems - Computing Environments - Open Source Operating Systems. Process: Process Concept - Process Scheduling - Operations on Processes.

#### Unit II **Process Scheduling**

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

#### Deadlocks Unit III

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

#### Unit IV Memory Management

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

#### Unit V Storage Management

File System: File Concepts - Access Methods. Secondary-Storage Structure : Overview - Disk Structure - Disk Scheduling: FCFS Scheduling - SSTF Scheduling-SCAN Scheduling-C-SCAN Scheduling-LOOK Scheduling- Selection of a Disk-Scheduling Algorithm - RAID structure. Case Studies: Linux System, Mobile **Operating System** 



12 h

14 h

12 h

10 h
1 Silberschatz, Galvin, Gagne, 2009, "Operating System Concepts", Eighth Edition, John Wiley & Sons Inc.

- 1 William Stallings, 2012, "Operating Systems: Internals and Design Principles", Seventh Edition, Prentice Hall publication
- 2 D.R.Choffnes, Harvey Deitel, Paul Deitel, 2004, "Operating Systems", Third Edition, Pearson/Prentice Hall publication



Course Code	Course Name	Category	L	Т	Р	Credit
192PY1A3IA	DIGITAL ELECTRONICS	IDC	4	-	-	4

# PREAMBLE

This course has been designed for students to learn and understand

- The concepts of number system and circuits
- The ideas about logic families and memory
- The design of microprocessors

### **COURSE OUTCOMES**

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

CO Number	CO Statement	Knowledge Level
CO1	Show and enumerate about the number system.	K1
CO2	Plan and simplify the expressions of combinational Logic Circuits	К3
CO3	Infer and outline the concept of sequential circuits	K2
CO4	Spell and understand the different types of logic families and memory	K1
CO5	Tell and understand the concept of microprocessors and microcontrollers.	K1

# MAPPING WITH PROGRAMME OUTCOMES

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



### Total Instruction Hours: 48 h

### Syllabus

### Unit I Number System

Binary Codes: Decimal – Binary – Octal – Hexadecimal – Binary addition – Multiplication – Division – Floating point representation – Complements – BCD – Excess3– Gray Code. Digital Logic: The Basic Gates – NOR – NAND – XOR Gates. Arithmetic Circuits: Half adder – Full adder – Half Subtractor – Full Subtractor

### Unit II Combinational Logic Circuits

Boolean algebra – Karnaugh map (Up to 4 Variables) – Canonical form 1 – Construction and properties – Implicants – Don't care combinations – Product of Sum – Sum of Products – Simplifications

### Unit III Sequential Circuits

Flip Flops – RS Flip Flops – Clocked RS Flip Flop – D Flip Flop – T Flip Flop – Master Slave JK Flip Flop. Registers: Registers – Decoders (3 to 8 line decoder) – Encoder (octal to binary encoder) – Multiplexers (4 to 1 line multiplexer) – Demultiplexers (1 to 8 line demultiplexer)

**Unit IV** Logic Families and Memory

Logic Families: Transistor - Transistor Logic (TTL) – Resistor Transistor Logic (RTL)– Diode Transistor Logic (DTL) Complementary Metal Oxide Semiconductor (CMOS). Memory: Memory Classification – Read/Write Memory – Read only Memory – Masked Read Only Memory - Programmable Read-Only Memory - Erasable Programmable Read-Only Memory - Electrically Erasable PROM - Flash Memory - Advantages in Memory Technology

### Unit V Microprocessors

Introduction and Evolution – Microprocessor Architecture – Microprocessor Bus Organization – Functional Block Diagram of 8085 Microprocessor – Pin out Diagram of 8085 – Microprocessor Programming – Instruction set of 8085 -Microcontrollers



10 h

9 h

10 h

9 h

- 1 Puri, V.K., 2017, "Digital Electronics Circuits and Systems", 1st Edition, TMH New Delhi
- 2 Ramesh Gaonkar, S., 2010, "Microprocessor Architeture, Programming, and Applications with the 8085", 5th Edition, New Delhi l

- 1 S.Salivahanan and S Arivazhagan, 2018, "Digital Circuits and Design", 5th Edition, Oxford University Press, Noida
- 2 Thomas Floyd L., 2015, "Digital Fundamentals", 11th Edition, Pearson Publication Ltd, New Delhi
- 3 Morris Mano M, 2012, "Digital Logic and Computer Design", 1st Edition, PHI, New Delhi
- 4 Carter M, 2008, "Computer Architecture", Schaum's outline series, 1st Edition, TMH ,New Delhi



# CORE PRACTICAL : NETWORK PROGRAMMING USING JAVA

# SEMESTER III

# Total Credits:2Total Instructions Hours:48 h

S.No	List of Experiments
1	Program to implement Java Statements
2	Program to implement Classes and methods
3	Program to implement singleton pattern
4	Program to demonstrate OOP concepts
5	Program to demonstrate multithreading
6	Program to implement Exception Handling
7	Program to implement packages
8	Program to implement string handling function
9	Program to implement Java streams
10	Program to use JDBC
11	Program to perform on RMI
12	Program to implement JavaFX

Note: Out of 12 - 10 Mandatory



Course Code	Course Name	Category	L	Т	Р	Credit
194IT1A3SA	INTERNET PROGRAMMING	SEC	4	-	-	4

### PREAMBLE

This course has been designed for students to learn and understand

- Web page and identify its elements and attributes
- The web pages using XHTML and Cascading Style Sheets
- Dynamic web pages using JavaScript (Client side programming

### **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 Websites	K1
CO2	Demonstrate about the HTML5 working concepts	K2
CO3	Interpreting the functioning of Control structures, Functions, Cookies using Java Scripts	K3
CO4	Analyze the concept of Node JS	K3
CO5	Inspect the Angular basics and its services in web applications	К3

# MAPPING WITH PROGRAMME OUTCOMES

COs/POs	PO1	PO2	PO3	PO4	PO5	
CO1	S	М	L	S	L	
CO2	L	М	S	S	S	
CO3	S	S	S	S	М	
CO4	S	S	S	S	М	
CO5	М	М	S	S	S	
S Stroi	S Strong M Medium L Low					



SEMESTER III

### Total Instruction Hours: 48 h

### Syllabus

**Unit I** Website Basics

Web Essentials: Clients, Servers and Communication – The Internet – Basic Internet protocols – World wide web – HTTP Request Message – HTTP Response Message – Web Clients – Web Servers. HTML: Formatting text by using tags, using lists and backgrounds, Creating hyperlinks and anchors. Style sheets, CSS formatting text using style sheets, formatting paragraphs using style sheets.

### **Unit II** HTML5 Tables, Forms and Media

Tables, Forms: Creating user forms, using check boxes and option buttons, creating lists, additional input types in HTML5, Incorporating sound and video: audio and video in HTML5, HTML multimedia basics, embedding video clips, incorporating audio on web page.

### **Unit III** Javascript Basics

JavaScript- Basics, Advantages of Java Script- Syntax- Enabling JS-Variables-Operators- Looping statements- Looping Controls-JavaScript Functions- Scripting Cookies-Dialog Box using JavaScript-Boolean Properties- JavaScript Booleanconstructor- Prototype-JavaScript String- Arrays.

### Unit IV Node JS

Learning Node.JS - Getting Started with Node.js - Using Events, Listeners, Timers, and Callbacks in NodeJS- Handling Data I/O in Node.js- Accessing the File System from Node.js- Implementing HTTP Services in Node.js-Implementing Socket Services in Node.js- Scaling Applications Using Multiple Processors in NodeJS

### **Unit V** Angular JS

Learning Angular-Jumping into Typescript-Getting Started with Angular – Angular Components- Expressions- Data Binding- Built-in Directives- Advanced Angular- Custom Directives -Events and Change Detection- Implementing Angular Services in Web Applications. Creating Your Own Custom Angular Services, Having Fun with Angular



08 h

10 h

10 h

10 h

- 1 Julie C. Meloni, 2015, "HTML, CSS and JavaScript All in One, Sams Teach Yourself",2nd Edition,Pearson Education
- 2 Brad Dayley Brendan Dayley, 2018, "Node.js, MongoDB and Angular Web Development", 2nd Edition, Addison –Wesley

- 1 Deitel and Deitel and Nieto, 2011, . "Internet and World Wide Web How to Program", 5th Edition, , Prentice Hall
- <sup>2</sup> FaitheWempen, 2011, "HTML5 Step by Step", Kindle Edition, Microsoft Press



S

# SEC PRACTICAL : INTERNET PROGRAMMING

# SEMESTER III

### Total Credits: 2

# **Total Instructions Hours:** 48 h

.No	List of Experiments						
1	Design a web page demonstrating all Style sheet types						
2	Design a web page with a form that uses all types of controls						
3	Design a web page with	n image map	S				
4	Design a web page emb	pedding with	multimedia features.				
	Create the following table using HTML with CSS October 2020 Bills						
	ITEM NAME	PRICE	DUE DATE				
5	Phone	\$50	March 1st				
	Car insurance	\$100	March 5th				
	Internet	\$70	March 10th				
6	Design a web page de (Array, Boolean, Date, I	emonstrating Function, Ma	different Core JavaScript references hth, Number, Object, String, regExp)				
7	Create a JavaScript form	n along with	validation controls.				
8	Performing File System Deleting File using Noc	n operations le.js.	such as creating, Reading, Writing,				
9	Create a Node.js file that writes an HTML form, with an upload field (Formidable module)						
10	Program to Implement Socket Services in Node.js.						
	Creating AngularJS Ap	plication					
11	Demo Application						
11	Enter your Name:						
	Welcome!						

12 Validate the user data using AngularJS code (\$dirty, \$invalid, \$error)

Jote: Gutof 12 - 10 Mandatory



### Total Instruction Hours: 24 h

### Syllabus

### **Unit I** Introduction to IoT

Introduction: Definition and characteristics of IoT - Physical design of IoT: Things in IoT, IoT Protocols - Logical design of IOT: IOT functional blocks, IoT communication models, IoT communication APIs - IoT Enabling technologies: Wireless Sensor networks, Cloud computing, Big data Analytics, Communication networks, Embedded system – IoT Levels & deployment templates

**Unit II** Domain Specific IoTs

Introduction - Home Automation – Cities – Environment – Energy – Retail – Logistic – Agriculture – Industry – Health & Lifestyle.

### **Unit III** IoT and M2M

Introduction – M2M – Difference between IoT and M2M – SDN and NFV for IoT. IoT system development with NETCONF-YANG: Need for IoT System Management, SNMP, Network operator requirement, NETCONF, YANG, IoT system management with NETCONF-YANG

Unit IVIoT Platforms Design Methodology5 h

Introduction- IoT design methodology : Purpose and requirement specification, Process specification, Domain model specification, Information model specification, Service specification, IoT level specification, Functional view, Operational view, Device and component integration, Application development

5 h	
	5 h

Introduction – Home Automation – Cities – Environment – Weather monitoring system – Agriculture – Productivity Applications



4 h

5 h

1 ArshdeepBahga, Vijay Madisetti, 2014, "Internet of Things - A Hands on Approach".

- David G. Hanes, Gonzalo Salgueiro, and Patrick Grossetete , 2017, "IoT
   Fundamentals: Networking Technologies, Protocols, and Use Cases for the Internet of Things".
- 2 Jamil Y. Khan, Mehmet R. Yuce, 2019, "Internet of Things (IoT): Systems and Applications".
- **3** RajkumarBuyya, Amir VahidDastjerdi , 2016, "Internet of Things: Principles and Paradigms".



### SEMESTER III

### **Total Credit:** 1

### **Syllabus**

### **Unit I** Introduction to hacking, Ports and Protocols

Hacking - Introduction to hacking- types of hacking- Phases of hacking- Protocols in hacking-Virtualization. Deep Web - Introduction to Deep Web-Dark Net-TOR (The Onion Router).

**Unit II** Scanning, Hacking and Foot printing

Scanning - what is scanning? Basics of scanning- Techniques of Scanning. System Hacking - Process of system Hacking-Password Cracking. Foot printing - Foot printing Types.

Unit III Malwares, Viruses and Worms

Malwares – Trojans- working of Trojans. Virus - Introduction to virus- working of virus-characteristics of virus. Worms

**Unit IV** Social Engineering

Social Engineering - Introduction to Social Engineering- process of social engineering- Identity theft. Phishing - what is phishing - phishing process- types of phishing Attacks.

**Unit V** Cryptography and Steganography

Cryptography : Cryptography- Digital signature- Hash functions. Steganography - what is Steganography- Steganography Process-Terms associated with Steganography-Methods- Steganography Tools.

### **Text Books**

1 Harsh Bothra, 2017, "Hacking: Be a Hacker with Ethics", Kindle Edition, Khanna Publishing

### References

- **1** Roger A Grimes, 2017, "Hacking the Hacker", John Wiley & Sons.
- 2 Michael Gregg, 2017, "Certified Ethical Hacker(CEH), Second Edition, Pearson IT Certification version 9.



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SEMESTER III

Total Credit: 1

### **Syllabus**

#### Unit I Network Models

Network Models: What is a Model- why use a model?- OSI Model:OSI-Beyond the Layers, OSI/ITU-T Protocols – Introducing TCP/IP: TCP/IP and the RFCs-The Practical Side of TCP/IP-Encapsulation-Addressing-Equipment

#### Ethernet and Internet Protocol Unit II

Ethernet:Structure: Preamble, Source and Destination MAC Addresses, Control Field, Data Field, Frame Check Sequence. Ethernet Operation- Physical Layer: Cabling -Encoding:10Base-T, 100Base-T, 1000Base-T-Topologies.Internet Protocol: Structure-Addressing- Operation-Security Warning

#### Unit III Address Resolution Protocol

Address Resolution Protocol: Techniques- Protocol Description- Structure-Addressing in the ARP Request- Addressing in the ARP Reply- Operation -Additional Operations-Security Warning-IPv6.

#### Unit IV Network Equipment and ICMP

Network Equipment: Tables and Hosts -Hubs or Repeaters-Switches and Bridges-Access Points-Routers- Multilayer Switches and Home Gateways- Security.

Internet Control Message Protocol: Structure- Operation and Types: Echo Request and Echo Reply, Redirect (Type 5), Time to Live Exceeded(Type 11), Destination Unreachable (Type 3) - IPv6

Unit V Subnetting and Other Masking Acrobatics

Subnetting and Other Masking Acrobatics: What is a Subnet?-Subnet Patterns-Subnet IP Addressing- A shorthand Technique- Effect on Address Space-Supernetting-Supernetted Network-Classless Inter-Domain Routing.

### **Text Books**

Bruce Hartpence, 2011, "Packet Guide to Core Network Protocols", First 1 Edition, O'Reilly

- 1 Andrew S. Tanenbaum, 2011, "COMPUTER NETWORKS", 5th edition, PHI.
  - Javvin, 2005, "Network Protocols Handbook", 2nd Edition, lavvin Techenosogies Inc., USA

ததி – 4 : அடிப்படைத்தமிழ்தாள் : 1(Basic Tamil )	SEMESTER III
	ததி – 4 : அடிப்படைத்தமிழ்தாள் : 1(Basic Tamil )

### Total Instruction Hours: 24 h

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

<b>அலகு</b> : 1	தமிழ் மொழியின் அடிப்பன	டைக் கூறுகள்		12 h			
அ) எழுத்துக 1. உயிர் 2. மெய் 3. உயிர் ஆ) சொற்களி	ள் அறிமுகம் : எழுத்துக்கள் - குறில் , நெடி எழுத்துக்கள் - வல்லினம், ( மெய் எழுத்துக்கள் 1ன் அறிமுகம்: பெயர்ச்சொல	ல் எழுத்துகள் மெல்லினம், இடையி ல், வினைச்சொல் – வி	ினம் 1)ளக்கம் (எ.கா.)				
அலகு : 2	குறிப்பு எழுதுதல்			12 h			
1. பெயர், ( 2. தமிழ் ம 3. எண்கள் 4. ஊர்வன 5. ஊர்களி 6. பயிற்சி	– 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 -	50			
சரியான வின	டயைத் தேர்வு செய்தல்	பகுதி –அ பகுதி –ஆ	10x2=20				
அரைப்பக்க அ	விளவில் விடையளிக்க		03x5=15				
இரண்டு பக்க	அளவில் விடையளிக்க	பகுதி-இ	01x15=15				

குறிப்பு

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



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

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



191TL1A3AB	பகுதி – 4 : சிறப்புத் தமிழ் தாள் : 1 (Advanced Tamil )	SEMESTER - III
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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	
<ul> <li>நட்புக் காலம் (10 கவிதைகள்) - அறிவுமதி கவிதைகள்</li> </ul>	
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	



வினாத்தாள் அமைப்பு முறை -		<b>மொத்த மதிப்பெண்கள்</b> - 50
	பகுதி –அ	
சரியான விடையைத் தேர்வு செய்தல்		10x1=10
	பகுதி –ஆ	
அரைப்பக்க அளவில் விடையளிக்க		05x3=15
	பகுதி-இ	
இரண்டு பக்க அளவில் விடையளிக்க		05x5=25

குறிப்பு

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

### **Text Books**

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

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



SEMESTER III

# **Total Instruction Hours:** 24h

# Syllabus

WOMEN'S RIGHTS

# Unit I Rights to Infant & Child

**195CR1A3AA** 

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

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 IIILaws for Senior Citizen women5 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-Personl 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



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

- 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	Course Name	т	LT	T P	Exam	Max Marks			Credit
Course Code	Category	Course Maine	L			( <b>h</b> )	CIA	ESE	Total	S
Fourth Semester										
Part – III										
194CS1A4CA	Core - V	Agile Methodology	4	1	-	3	25	75	100	4
194IT1A4CA	Core - VI	Relational Database Management System	4	1	-	3	25	75	100	4
195AT1A4IA	IDC - IV	Digital Marketing	4	-	-	3	25	75	100	4
194IT1A4CP	Core Practical - VI	Dot Net with RDBMS	-	-	4	3	40	60	100	2
194CS1A4SA	SEC- II	Python Programming	4	-	-	3	25	75	100	4
194IT1A4SP	SEC Practical- II	Programming in Python	-	-	4	3	40	60	100	2
	GE – II		2	-	-	3	-	50	50	2
	LoP	Lab on Project	-	-	-	-	-	-	_	-
Part - IV		·								
191TL1A4AA		Basic Tamil								
191TL1A4AB	AECC - IV	Advanced Tamil	2	-	-	3	-	50	50	2
192PY1A4AA		General Awareness								
Total				2	8	-	-	-	700	24



Course Code	Course Name	Category	L	Т	Р	Credit
194CS1A4CA	AGILE METHODOLOGY	CORE	4	1	0	4

### PREAMBLE

This course has been designed for students to learn and understand

- The fundamental concepts of project management.
- The theory behind Agile Methodology
- To apply Agile methodology in Project Management tasks.

### **COURSE OUTCOMES**

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

CO Number	CO Statement	Knowledge Level			
CO1	Ability to understand the various Project Management tasks.	K2			
CO2	2 Understand the basic techniques of Agile Methodology				
CO3	Apply Lean and Agile in Project Management Life Cycle.	K3			
CO4	Learn about Agile Management	K3			
CO5	Ability to apply the Agile Leadership Ethics in Project Management.	К3			

# MAPPING WITH PROGRAMME OUTCOMES

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



SEMESTER IV

#### Total Instruction Hours: 60 h

### **Syllabus**

#### Unit I Introduction to Project Management

Understanding Project Management Theory: The Three Faces of Traditional Project Management - Project Initiation - Project Planning - Project Execution - Project Monitoring and Controlling - Project Closing - Roles and Responsibilities -Common Project Management Challenges - Managing Project Success - A Lean History of Lean - Five Laws of Lean

#### Unit II Basics of Agile Methodology

Agile Comprehensive: Earned Value Management - Agile Basic Tools and Techniques - Agile Manufacturing - Agile Change Management - Agile Project Management - Agile Challenges. Applying Lean and Agile to the Project Management Life Cycle: Initiating the Project: Project Selection Using the Lean Six Sigma Model.

#### Unit III Agile Planning and Execution 12 h

Applying Lean and Agile to the Project Management Life Cycle: The Planning Process: WBS - The Project Plan - Models for Planning. Project Execution: Evaluation Metrics for Piloting or Testing - Schedule and Effort / Cost Variance -Resource Utilization - Change Requests to Scope of Work - Performance Monitoring-Provide Project Status.

#### Unit IV Agile Management

Monitoring, Controlling and Closing a Project: The Data Collection Plan - Change Management - Making Communication Easier - Specific Activities - Managing and Tracking: Decisions - Action Items - Execute and Revise Project Schedule - Manage Risk - Cause and Effect Matrix - Control Charts - Tools. Applying Lean and Agile Techniques to Project Management: Integration - Scope - Time - Cost - Quality -Human Resource - Communications - Risk

#### Unit V Lean and Agile Leadership Ethics 12 h

Ethics and Social Responsibility: Ethics - Values - The Lean and Agile Project Manager: Being Both a Leader and a Manager - Appreciation of a System -Knowledge of Variation - Theory of Knowledge - Understanding of Psychology -



12 h

12 h

Change Management Basics for Lean and Agile Project Managers - Change Management Basics for Lean and Agile Project Managers - Lean and Agile Project Management International.

# **Text Books**

1

Terra Vanzant Stern, 2017, "Lean and Agile Project Management-How to Make Any Project Better, Faster, and More Cost Effective", 1st Edition, CRC Press.

- 1 Bruce Powel Douglass, 2016, "Agile Systems Engineering", Kindle Edition, Morgan Kaufmann.
- 2 David C.Kung, 2013, "Object-Oriented Software Engineering: An Agile Unified Methodology", 1st Edition, TMH.
- **3** Hazza and Dubinsky, 2009, "Agile Software Engineering, Series: Undergraduate Topics in Computer Science", Springer.



Course Code	Course Name	Category	L	Т	Р	Credit
194IT1A4CA	RELATIONAL DATABASE MANAGEMENT SYSTEM	CORE	4	1	-	4

### PREAMBLE

This course has been designed for students to learn and understand

- the knowledge about database and manipulation of database.
- the database management system
- the knowledge of database designer using named PL/SQL Blocks.

### **COURSE OUTCOMES**

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the database concepts, modeling, dependencies and normalization.	K1
CO2	Recognize the basics and facts of Oracle9i with DDL commands.	K2
CO3	Develop the knowledge of data management using DML and TCL Commands.	K3
CO4	Acquire knowledge of PL/SQL to develop, organize and manage a database with huge data.	K3
CO5	Illustrate the knowledge of database designer using named PL/SQL Blocks	K3

### MAPPING WITH PROGRAMME OUTCOMES

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



SEMESTER IV

Total Instruction Hours: 60 h

### **Syllabus**

#### Unit I Database Concepts

Database Concepts: A Relational approach: Database - Relationships - DBMS -Relational Data Model - Integrity Rules - Theoretical Relational Languages. Database Design: Data Modeling and Normalization: Data Modeling – Dependency Database Design – Normal forms: First normal form – Second normal form–Third normal form- Dependency Diagrams – De -normalization.

#### Unit II Oracle9i

Oracle9i: Oracle9i an introduction - SQL. Oracle Tables: DDL: Naming Rules and conventions - Data Types - Constraints - Creating Oracle Table - Displaying Table Information – Altering an Existing Table – Dropping, Renaming, Truncating Table - Table Types - Spooling - Error codes.

#### 12 h Unit III Data Management and Retrieval

Data Management and Retrieval: DML – adding a new Row/Record – Updating and Deleting an Existing Rows/Records – retrieving Data from Table – Arithmetic Operations - restricting Data with WHERE clause - Sorting - Transactions-Locking rows for update-Controlling Access. Functions and Grouping: Built-in functions -Grouping Data. Multiple Tables: Joins and Set operations: Join – Set operations.

Unit IV PL/SQL

PL/SQL: History - Fundamentals - Block Structure - Comments - Data Types -Other Data Types - Declaration - Assignment operation - Bind variables -Substitution Variables - Printing - Arithmetic Operators. Control Structures and Embedded SQL: Control Structures - Nested Blocks - SQL in PL/SQL - Data Manipulation - Transaction Control statements.

Unit V 12 h PL/SQL Cursors, Exceptions, PL/SQL Named Blocks

PL/SQL Cursors and Exceptions: Cursors - Implicit & Explicit Cursors and Cursor FOR loops - Exceptions - Types of Exceptions. PL/SQL Attributes – Named Blocks: Procedures – Functions – Packages – Triggers.



12 h

12 h

1 Nilesh Shah, 2016,"Database Systems Using ORACLE", Pearson Education India

- 1 ArunMajumdar&Pritimoy Bhattacharya, 2017"Database Management Systems", McGraw Hill Education
- 2 Kevin Loney, George Koch, and the Experts at TUSC, 2002,"Oracle 9i: The Complete Reference", TMH,



Course Code	Course Name	Category	L	Т	Р	Credit
195AT1A4IA	DIGITAL MARKETING	IDC	4	I	I	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.	К3
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	М	М	S	М
CO2	S	М	S	М	S
CO3	S	S	М	S	М
CO4	М	М	М	S	L
CO5	S	М	S	S	М
S Strong M Medium L Low					



8 h

10 h

10 h

10 h

# SEMESTER IV

# Total Credits: 4

# Total Instruction Hours: 48 h

### Syllabus

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

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

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

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
		10 11

Introduction- Search Engine – concepts- On page and off page Phasesoptimizations- 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

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.



**1** Seema Gupta , 2017, "Digital Marketing" , 1st Edition , McGraw-Hill.

- 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.



# CORE PRACTICAL: DOT NET WITH RDBMS

### SEMESTER IV

# Total Credits: 2

# **Total Instructions Hours:** 48 h

S.No

1

6

### List of Experiments

Implementation of DDL commands with Constraints and DML commands with

- Group By & amp; having clause
  - Order by clause
    - Indexing
    - Views
- 2 Implementation of joins and operators
- 3 Implementation of PL/SQL program with cursors and exceptions.
- 4 Implementation of SQL Triggers.
- 5 Write a program working with forms using ASP.NET.

Write a program in asp.net containing the following controls:

- A ListBox
- A Button
- An Image
- A Label
- 7 Implement a program using Auto post back property in asp.net.
- 8 Validate sample information using validation controls in asp.net.
- 9 Implement a program using AdRotator control in asp.net.
- 10 Design and develop a login form to check the authentication of the user with the data stored in oracle database.
- **11** Design and develop a web form to display the data in a data grid control (purchase database).
- 12 Program to create an application for student information to insert, delete, and update records in database

Note: Out of 12 - 10 Mandatory



Course Code	Course Name	Category	L	Т	Р	Credit
194CS1A4SA	PYTHON PROGRAMMING	SEC	4	0	0	4

### PREAMBLE

This course has been designed for students to learn and understand

- the fundamentals of python
- a function-oriented programming paradigm through python
- the implementation of various applications using python

### **COURSE OUTCOMES**

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

CO Number	CO Statement	Knowledge Level
CO1	Enable the students to understand the basic principles of the Python Language.	K1
CO2	Applying the design principles in the data-driven applications	K2
CO3	Enabling to design the web-based applications using Python	К2
CO4	Understanding the machine learning ability of Python based components	К3
CO5	Solving the real time problems using Python	K4

# MAPPING WITH PROGRAMME OUTCOMES

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



SEMESTER IV

### Total Instruction Hours: 48 h

### Syllabus

### **Unit I** Introduction to Python

Introduction: Python overview– Comments – Python identifiers – Reserved keywords – Variables – Standard data types – Operators –Statements and Expressions . Control Statements: The for loop – While statement – if elif else statement – Input from keyboard.

### Unit II Functions and Strings

Functions: Introduction – Built-in functions – Type conversion – Type coercion – Date and time – dir() function – help() function – User defined functions – Parameters & arguments – Function calls – The return statement –Python recursive function. Strings: Compound data type – len() function – String slices – String traversal – Escape characters – String formatting operator – String formatting functions.

### **Unit III** Lists, Tuples and Dictionaries 10 h

Lists – Values and accessing elements – Traversing a list – Deleting elements from list – Built-in list operators – Built-in list methods. Tuples – Creating tuples – Accessing values in tuples – Tuple assignment –Tuples as return values – Basic tuple operations – Built-in tuple functions. Dictionaries – Creating a dictionary – Accessing, Updating, Deleting elements from dictionary – Operations in dictionary – Built-in dictionary methods.

### **Unit IV** NumPy Library

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

### Unit V Pandas

Pandas: The Python Data Analysis Library: Installation- Getting Started with pandas - Pandas Data Structures - Other Functionalities on Indexes - Operations between Data Structures - Function Application and Mapping - Sorting and Ranking - "Not a Number" Data. Pandas: Reading and Writing Data: CSV and



8 h

10 h

10 h

- **1** E. Balagurusamy, 2016, "Introduction to Computing and Problem Solving Using Python", McGrawHill publication. (Unit 1, 2 and 3)
- Fabio Nelli , 2015, "Python Data Analytics" , Apress, 1st Edition.
   (Unit 4 and 5)

- 1 Wes McKinney, 2011, "Python for Data Analysis: Data Wrangling with Pandas, NumPy, and Ipythony", O'Reilly.
- 2 Zed Shaw, 2014, "Learn Python the Hard Way", Addison-Wesley, 3rd Edition
- 3 www.spoken-tutorial.org



# SEC PRACTICAL: PROGRAMMING IN PYTHON

### SEMESTER IV

# Total Credits:2Total Instructions Hours:48h

S.No	List of Experiments
1	Write a program to demonstrate working of List, Set, Tuple and Dictionary data type.
2	Write a python program to implement various string operations.
3	Develop a calculator that includes all the operators in python. For the given set of input perform the operation based on the user's choice.
4	Write a program to illustrate looping structures in python.
5	Write a program to demonstrate recursion function.
6	Write a program to illustrate an application of array.
7	Write a program to demonstrate inheritance in python.
8	Write a program to show how a module can be implemented in python.
9	Write a program to implement various file operations in python.
10	Write a program to demonstrate various array operations using Numpy library functions.
11	Write a python program to illustrate different functions available in Pandas package.

**12** Write a program to illustrate data visualization in python.

Note: Out of 12 - 10 Mandatory



5 h

# Total Credits: 2

SEMESTER IV

# Total Instruction Hours: 24 h

### Syllabus

### **Unit I** Introduction to SEO

What Is SEO? - Benefits and Challenges in SEO. Black-Hat SEO vs. White-Hat SEO - On-Page and Off-Page SEO. Search Engines: Evolution of Search Engines -Search Engine Processes and Components – How Search Engines Work- Web Directories.

**Unit II** Ranking in SEO and Introducing the Google Tools Suite 4 h

On-Page SEO - On-Site SEO - Off-Page SEO. Introducing the Google Tools Suite: Google My Business-Google AdWords Keyword Planner-Google Trends-Page Speed Insight -Google Analytics-Google Search Console.

Unit IIIObstacles in SEO and Sitemaps5 h

Black-Hat SEO-Irrelevant Content-Targeting the Wrong Audience-Ignoring UX for Your Website-Slow Page Load Time-Using Flash on Your Site-JavaScript Accessibility Issues-AMP. Types of Sitemap-Creating a Sitemap-Popular Sitemap Generators.

**Unit IV** Keyword Research, Strategy and Link Building 5 h

Types of Keywords-Sources of Keywords-Boosting Your On-Page SEO Using Keywords and Long-Tail Terms. Link Building: Important Factors for Link Building-Link-Building Resources and Utilities-Link-Building Tools.

**Unit V** Content Considerations, SEO Hub and Social Media 5 h Marketing

Content Consideration Factors and Subsequent Implementation- Tools Used for Content Consideration and Curation- Content Building and Optimization- Site Audits. Implementing SMM- Popular Social Media Networks: Facebook, Twitter, Google+.



1 AravindShenoy and AnirudhPrabhu, 2016,"Introducing SEO Your quick-start guide to effective SEO practices", 1st Edition,Apress.

- 1 Ryan, D., 2014, "Understanding Digital Marketing: Marketing Strategies for Engaging the Digital Generation", Kogan Page Limited. (2014).
- 2 Pulizzi, J., 2015, "The Beginner's Guide to Digital Marketing" Digital Marketer., McGraw Hill Education.


191TL1A4AA	பகுதி – 4 :அடிப்படைத்தமிழ் - தாள் : II	SEMES	FER IV	
	(Basic Tamil)			
·	Tota	al Credits:	2	
	Total Instruction	on Hours:	24 h	
வை	ங்கவை 2019–20 ஆம் கல்வியாண்டு முகல் சேர்வோர்க்கு	ரியகா		
سابھ نیسفسین 10)	ப்படிக்கும் கண்டியானர் முதல் சோ ஊார்க்கு நி2 – அம் வகுப்ப வரை தமிம் மொமிப்பாடம் பயிலாகவ	ாயது வர்களுக்கு)	1	
	பருவத் தேர்வு உண்டு )			
வலக் <b>1</b>			12 h	
			12 11	
நத⊨நூலகள I வச்சிசும	- " உறம் செய விரும்ப" முகல் "னைவியம் பேசேல்"வ	ரை -12 பா	ு ல்சன்	
1.ஆற்றாருடி 11 சொன்றைவேக்	அற்ம சேய வரும்பு முதல் கோவியம் பேசேல் வர சன் - " வன்னையம் பிசாவம் மன்னறி செய்வம்" மசல்		_00301	
ന.ഞ്ഞ്ഞ്ഞ്ഞ്ഞ്ഞ്ഞ്ഞ്ഞ്	தன் அன்னையும் பதாவும் முன்னநாதையமை முதல "எண்ணம் எழுத்தும் தண் எனத் தகும்" வரை -7 பா	டல்கள்		
III கிருக்குறன் - 6 i	பாடல்கள்			
1. அகா மகல	)1			
2. மனக்குக் க	5ண்34			
3. இனிய உள	ாவாக100			
⊿. கீயவை கீ <b>ய</b>	ப பயக்கலான்202			
் 5. கற்க கசட <u>ா</u>	ے۔ بر			
6. கண்ணொ(	_ ந கண்ணினை1100			
அலகு : 2	-		12 h	
ா. எளாய நதாககதை 1 நீகிகாக்க ப	தகளும் வாழ்ககை முறைகளும் மன்னன்			
2. சிங்கமும் பு	சயலும்			
3. புத்திசாலி	~ உழவனும் போக்கிரிப் பூதமும்			
4. தேனீயும் பு	றாவும்			
5. முயல் கூறி	ிய தீர்ப்பு			
II. தமிழகப் பண்ட	பாடுகள்			
1.  தமிழர் விழ	ாக்கள் - பொங்கல், ஆடிப்பெருக்கு			
2. தமிழர் கன	லகள் - தெருக்கூத்து, ஓவியம், சிற்பம்			
3. தமிழர் வின	ளையாட்டுகள்- ஏறுதழுவுதல், சடுகுடு			



Dr.NGPASC

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III . பயிற்சிப் பகுதி

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

Note: பயிற்சிப் பகுதியில் வினாக்கள் அமைத்தல் கூடாது

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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
```

ஒரு பக்க அளவில் விடையளிக்க 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

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



191TL1A4AB	பகுத	SEMEST	ER-IV	
		Tota	al Credits:	2
		Total Instruction	on Hours:	24 h
இளங்க	கலை 2019– 20	20 ஆம் கல்வியாண்டு முதல் சேர்வோர்க்கு	தரியது	
(10 மற்றும் 12	? – ஆம் வகுப்ப	<sub>l</sub> களில் தமிழ் மொழிப்பாடம் பயின்றவர்க	ளுக்கு உரி	யது
		(பருவத் தேர்வு உண்டு )		
அலகு – 1				05 h
திருக்குறள்				
I அறத்துப்பால்				
1. இனியவை	கூறல் -	- அதிகார எண் : 10		
2. அடக்கமுன	டமை	- அதிகார எண் : 13		
II பொருட்பால்				
1. கல்வி		- அதிகார எண் : 40		
2. உழவு		- அதிகார எண் : 104		
III இன்பத்துப்பாவ்	υ			
1. தகையணங்	ங்குறுத்தல் -	அதிகார எண் :109		
2. பிரிவாற்றா	ாமை –	அதிகார எண் : 116		
அலகு – 2				05 h
கட்டினாக் கொகு				
ி நல்வாம்வு - டாச	–¬ க்டர் மு.வரகரா	சன்		
் பி. நம்பிக்கை				
2. புலனடக்க	ம்			
3. பண்பாடு				
II இளைஞர்களின்	ஒளிமயமான	எதிர்காலத்திற்கு - கு.வெ. பாலசுப்பிரமண	ியம்	
1. காலக்கண	க்கு			
2. நற்பழக்கே	ம செல்வம்			
அலகு – 3				05 h
I காப்பியங்கள் - <sub>(</sub>	தறிப்பு எழுதுத	ລ່		
1. சிலப்பதிகா	ாரம்			
2. மணிமேகன	ກຎ			
3. கம்பராமாட	பணம்			
4. பெரியபுரா	ணம்			



II ஊடகம் - காட்சி ஊடகங்கள்			
1. தொலைக்காட்சி			
2. திரைப்படம்			
3. இணையம்			
4. முகநூல்			
5. கீச்சகம்			
6. கட்செவி அஞ்சல்			
அலகு – 4		C	)5 h
இலக்கணம் - வழக்கறிதல்			
1. இயல்பு வழக்கு			
2. தகுதி வழக்கு			
அலகு – 5		C	)4 h
l படைப்பாற்றல் பகுதி			
கவிதை,கட்டுரை எழுதச்செய்தல்	் - பொதுத் தலைப்பு		
II பயிற்சிப் பகுதி			
தமிழில் தட்டச்சு செய்தல் - யூனி	கோடு எழுத்துருவில்.		
Note: பயிற்சிப் பகுதியில் வினாக்கள் அ	ுமைத்தல் கூடாது		
வினாத்தாள் அமைப்பு	முறை - மொத்த மதிப்ெ	பண்கள் - 100	
	பகுதி –அ		
சரியான விடையைத் தேர்வு செய்தல்		10x2=20	
	பகுதி –ஆ		
கோடிட்ட இடங்களை நிரப்புக		10x2=20	
	பகுதி –இ		
இரண்டு பக்க அளவில் விடையளிக்க		4x15=60	

இரண்டு பக்க அளவில் விடையளிக்க

குறிப்பு :

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



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

- 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



# Total Credits:2Total Instructions Hours:24 h

#### S.No

#### Contents

- 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

- 1 Majid Hussain, Arrora 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	Course Name	т	т	Р	Exam	Ma	ax Ma	rks	Cradita			
Course Code	Category		L	1		(h)	CIA	ESE	Total	Credits			
Fifth Semester	·		•		•								
194CT1A5CA	Core - VII	Data Communication and Networks	4	-	-	3	25	75	100	4			
194IT1A5CA	Core - VIII	Big Data Analytics	4	-	-	3	25	75	100	4			
194IT1A5CB	Core -IX	Cyber Crime and Digital Forensic	4	-	-	3	25	75	100	4			
194IT1A5CC	Core-X	Artificial Intelligence and Machine Learning	4	-	-	3	25	75	100	4			
194IT1A5CP	Core Practical-VII	Data Analytics	-	-	4	3	40	60	100	2			
194IT1A5CQ	Core Practical- VIII	Mobile Application Development	-	-	4	3	40	60	100	2			
194IT1A5DA		5G Mobile Networks											
194IT1A5DB	DSE -I	Next Generation Database	4	-	-	-	-	-	3	25	75	100	4
194IT1A5DC		Deep Learning											
194IT1A5TA	IT	Industrial Training	Grade A to C										
194IT1A5LA	LoP	Lab on Project	-	-	-	-	50	-	50	1			
Part - IV													
192MT1A5AA	AECC - V	Research Methodology	2	-	-	3	-	50	50	2			
Total			22	-	8	-	-	-	800	27			



Course Code	Course Name	Category	L	Т	Р	Credit
194CT1A5CA	DATA COMMUNICATION AND NETWORKS	CORE	4	I	I	4

This course has been designed for students to learn and understand

- Modes of Data Transmission, Transmission Media and Network Topologies.
- OSI layers, Routing Algorithms and ISDN architecture
- Internetworking devices, Analyze the problems in inter networking, TCP and UDP

# **COURSE OUTCOMES**

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

CO Number	CO Statement	Knowledge Level
CO1	Know about Data Communications and Transmission Methods	K1,K2
CO2	Describe modes of Data Transmission, Multiplexing Techniques and Transmission Media	K1,K2
CO3	Interpret Network Topologies, OSI layers and Routing Algorithms	К3
CO4	Understand the ISDN Architecture, Internetworking concepts and Basics of TCP/IP	K3
CO5	Apply TCP and UDP formats.	K3

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

#### SEMESTER V

#### **Total Credits:** 4

#### Total Instruction Hours: 48 h

#### Syllabus

**Unit I** Data Communication and Transmission Methods 10 h

Introduction to Data Communications and Networking: Data Communications – Protocols - Standards – Signal propagation – Analog and Digital Signals – Bandwidth of a Signal

Analog and Digital Transmission Methods: Analog Signal, Analog Transmission – Digital Signal, Digital Transmission – Digital Signal, Analog Transmission – Analog Signal, Digital Transmission – Baud Rate

Unit IIData Transmission Modes, Multiplexing and Transmission<br/>Media12 h

Modes of Data Transmission and Multiplexing: Parallel and Serial Communication – Asynchronous, Synchronous and Isochronous Communication – Simplex, Halfduplex, Full-duplex Communication.

Multiplexing: Frequency Division Multiplexing – Time Division Multiplexing – Statistical Time Division Multiplexing – Wavelength Division Multiplexing.

Transmission Errors: Introduction – Error Classification - Types of Error

Error Detection: Checksum – Vertical Redundancy Check – Longitudinal Redundancy Check – Cyclic Redundancy Check.

Transmission Media: Guided Media, Unguided Media.

**Unit III** Network Topologies, Switching and Routing, OSI layers 10 h

Network Topologies: Mesh, Star, Tree, Ring, Bus.

Switching Techniques: Circuit Switching, Message Switching, Packet Switching.

Routing Algorithms: Routers and Routing – Factors affecting Routing Algorithms - Routing Algorithms: Distance Vector Routing - Link State Routing.

Network Protocols and OSI Model: Protocols in Computer Communications – OSI Model – OSI Layer Functions.



# **Unit IV** ISDN, Internetworking and Basics of TCP/IP 8 h

Integrated Services Digital Network (ISDN): ISDN Architecture - ISDN interfaces.

Internetworking Concepts: Introduction – The Problems in Internetworking - Internetworking Devices - Repeaters – Bridges – Routers – Gateways.

Introduction to TCP / IP: Introduction - TCP/IP Basics - Example - Address Resolution Protocol - Reverse Address Resolution Protocol - Internet Control Message Protocol.

**Unit V** TCP & UDP

TCP & UDP: Features of TCP - Relationship between TCP and IP - Ports and Sockets - TCP connections - What makes TCP Reliable - TCP Packet Format.

User Datagram Protocol (UDP): UDP - UDP Packet - Difference between UDP and TCP - Domain Name System (DNS) - Electronic Mail (Email) - File Transfer Protocol (FTP).

# **Text Books**

1 Achyut S. Godbole , 9th reprint, 2018, "Data Communications and Networks", 2nd Edition, Tata McGraw Hill Publications

# References

- 1 Behrouz A. Forouzan, 2007, "Data Communications and Networking", 4th Edition, Tata McGraw-Hill Publication
- 2 Andrew S. Tanenbaum, 2003, "Computer Networks", 4th Edition, Prentice Hall of India.



Course Code	Course Name	Category	L	T	Р	Credit
194IT1A5CA	<b>BIG DATA ANALYTICS</b>	CORE	4	-	I	4

This course has been designed for students to learn and understand

- The techniques and tools required for data science and big data analytics.
- The concepts, principles, and techniques applicable to technology and industry.
- The various search methods and visualization techniques using Hadoop.

# **COURSE OUTCOMES**

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

CO Number	CO Statement	Knowledge Level
CO1	Define and analyze the characteristics of Big data	K1
CO2	Apply the knowledge of R programming tools and techniques in Bigdata	K2, K3
CO3	Explain the technology landscape behind the Big Data Analytics using Hadoop.	K3
CO4	Solve distributed computing challenges with the help of Hadoop, MongoDB and NoSQL.	К3
CO5	Differentiate between Pig and Hive in terms of processing	K4, K5

COs/POs	PO1	PO2	PO3	PO4	PO5
CO1	L	М	S	М	S
CO2	S	S	М	S	М
CO3	М	S	S	S	М
CO4	S	М	S	М	S
CO5	М	S	М	S	S
S Stroi	ng	M Med	ium	L Low	



08 h

12 h

#### Total Credits: 4

SEMESTER V

#### Total Instruction Hours: 48 h

#### Syllabus

#### **Unit I** Introduction to Big Data Analytics

Characteristics of Data - Evolution of Big Data- Definition of Big Data-Challenges with Big Data- What is Big Data-Why Big Data-Traditional Business Intelligence (BI) versus Big Data- A Typical Hadoop Environment- Big Data Analytics- What is Big Data Analytics- Classification of Analytics Why is Big Data Analytics Important.

**Unit II** Data Analytics Using R

Introduction to R-R Graphical User Interfaces-Data Import and Export-Attribute and Data Types-Descriptive Statistics. - Exploratory Data Analysis-Visualization Before Analysis- Visualizing a Single Variable-Examining Multiple Variables. Statistical Methods for Evaluation-Hypothesis Testing-Difference of Means.

**Unit III** Introduction to Hadoop and MapReduce 10 h

Introducing Hadoop-Why Hadoop? -RDBMS versus Hadoop-History of Hadoop-Hadoop Overview-Use Case of Hadoop-Hadoop Distributors-HDFS (Hadoop Distributed File System)-Processing Data with Hadoop-Interacting with Hadoop Ecosystem-Introduction to MAPREDUCE- Mapper- Reducer- Combiner-Partitioner-Searching-Sorting-Compression.

**Unit IV** Introduction to MongoDB and NoSQL 10 h

What is MongoDB- Why MongoDB? - Data Types in MongoDB- MongoDB Query Language-NoSQL-Introduction-Types of NoSQL Databases-Advantages of NoSQL-SQL Vs NoSQL.

Unit VIntroduction to Hive and Pig08 h

What is Hive- Hive Architecture- Hive Data Types-Hive File Format- Hive Query Language. (HQL). Introduction to Pig- The Anatomy of Pig- Pig on Hadoop- Pig Philosophy- Use Case for Pig: ETL Processing- Data Types in Pig- Running Pig-Execution Modes of Pig



1 Seema Acharya, Subhashini Chellappan, 2015, "Big Data and Analytics", 1st Edition, Wiley.

- 1 Seema Acharya, 2018, "Data Analytics Using R" First Edition,McGraw Hill Education (India) Private Limited.
- 2 Vignesh Prajapati, 2013, "Big Data Analytics with R and Hadoop", Packet Publishing.
- **3** Tom White, 2012, "HADOOP: The definitive Guide", O Reilly.



Course Code	Course Name	Category	L	Т	Р	Credit
194IT1A5CB	CYBER CRIME AND DIGITAL FORENSIC	CORE	4	-	-	4

This course has been designed for students to learn and understand

- The application of forensics and analyze computer forensic evidence.
- The essential Protocols and Knowledge about Forensic
- The importance of network forensic principles, legal considerations, digital evidence controls.

#### **COURSE OUTCOMES**

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic forensics and techniques for conducting the forensic.	K1
CO2	Examine digital evidences such as the data acquisition, Threats and Applications	K1, K2
CO3	Apply forensic analysis tools to recover important evidence for identifying computer crime.	K2, K3
CO4	Learn Theft and fraud identification	K3
CO5	Acquire Knowledge on Web based criminal activity and crime investigators.	К3

#### MAPPING WITH PROGRAMME OUTCOMES

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



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SEMESTER V

# Total Instruction Hours: 48 h

#### Syllabus

#### **Unit I** Fundamentals of Cybercrime

**194IT1A5CB** 

Cybercrime: Introduction, Motivation and Methods: Introduction-The Scale of the Problem and Reasons for the Growth of Cyber Crime-Profiling Cyber Criminals-Challenges for Criminal Justice and Law Enforcement-The Future of Cybercrime

Unit II Compute	er System as Target	10 h
-----------------	---------------------	------

Unauthorized Access Offences in Cyberworld: Emerging Threats: Expected Targets and Forms- Criminal Statutes- Other Offences Associated with Hacking

Injection of Malicious Code in Application: Introduction- Types of Malicious Code-Threats Posed by Viruses, Worms, and Trojan Horses. Legislative Approaches.

Unit III	Introduction	and	overview	of	Computer	forensics	and	10 h
	Cybercrime							10 11

Introduction- Cyberspace and criminal behavior-clarification of terms-traditional problems associated with computer crime-extent of the problem-the emergence of e-cash: a new problem for law enforcement-Traditional computer crimes: Traditional problem-recognizing and defining computer crime-three incidents-phreakers-hacking-computers as commodities-theft of intellectual property

**Unit IV** Contemporary Computer Crime & Identify Theft & Fraud 12 h

Web based criminal activity-Malware-Theft of Information, Data Manipulation and Web Encroachment-Terrorism

Typologies of Identity Theft/Fraud-Prevalence and Victimology-Physical Methods of Identity Theft- Virtual or Internet-Facilitated Methods

Computer Forensics- Traditional Problems in Computer Investigations-Disk Structure and Digital Evidence-Developing Computer Forensic Science Capabilities-Minimum Housing, Hardware, Software Requirements- A Sampling of Popular Forensic Software



# **Unit V** Searching and Seizing Computer-Related Evidence

Traditional Problems Associated with Finding Digital Evidence-Pre-search activities-On-scene Activities-Processing of evidence and report preparation: Aspects of data analysis-Non windows Operating Systems- Smart phones and GPS forensics-A sample of Popular products

# **Text Books**

Mohamed Chawki, Ashraf Darwish, Mohammad Ayoub Khan, Sapna Tyagi,

- 1 2015, "Cybercrime, Digital Forensics and Jurisdiction", Third Edition, Springer & London.
- 2 Marjie T.Britz, "Computer Forensics and Cyber Crime", Third Edition, Pearson, New York.

# References

**1** Thomas J, Holt Adam M, Bossler Kathryn C, Seigfried-Spellar, "Cybercrime and Digital Forensics: An Introduction", Kindle.



Course Code	Course Name	Category	L	T	Р	Credit
194IT1A5CC	ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING	CORE	4	I	-	4

This course has been designed for students to learn and understand

- The fundamental concepts of Artificial intelligence
- The Problem solving methods with searching techniques
- The concept of Supervised, Unsupervised and Reinforcement Learning

#### **COURSE OUTCOMES**

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the history of artificial intelligence and its foundation	K1
CO2	Apply problem solving methods with searching techniques	К3
CO3	Understand the fundamental concepts of machine learning	K1,K2
CO4	Demonstrate on supervised learning with various techniques	K4
CO5	Learn the concepts of clustering and reinforcement learning	K4

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



Unit I

08 h

#### Total Credits: 4

SEMESTER V

#### Total Instruction Hours: 48 h

#### **Syllabus**

Introduction to Artificial Intelligence Introduction - Definition - History of Artificial Intelligence - Characteristics of Intelligent Agents - How Agents should Act - Structure of Intelligent Agents Unit II 10 h Problem Solving Methods Problem Solving Methods - Search Strategies - Breadth first search - Uniform cost search - Depth first Search - Depth limited Search - Iterative deepening Search -Bidirectional Search - Constraint Satisfaction Problems Unit III 10 h Fundamental of Machine Learning History and Evolution - Different forms - Statistics - Data mining - Data Analytics -Data Science - Machine Learning Categories - Supervised Learning - Unsupervised Learning - Reinforcement Learning Unit IV 10 h Supervised Learning Supervised Learning - Regression - Polynomial Regression - Multivariate

Regression - Supervised Learning - Classification - Logistic Regression - Evaluating a classification model performance - Decision Tree - Support Vector Machine - k Nearest Neighbour(kNN)

Unit V 10 h Unsupervised Learning, Reinforcement Learning

Unsupervised Learning: Clustering - K- means - Finding value of k - Hierarchical clustering - Principal component Analysis - Reinforcement Learning



- 1 S. Russell and P. Norvig, 2009, "Artificial Intelligence: A Modern Approach", Prentice Hall, Third Edition
- 2 Manohar Swamynathan, 2017, "Mastering Machine Learning with Python in Six steps", Apress media.

- **1** Bishop, C., 2006,"Pattern Recognition and Machine Learning", Springer-Verlag, Berlin.
- 2 Ethem Alpaydin, 2014, "Introduction to Machine Learning 3e (Adaptive Computation and Machine Learning Series), Third Edition, MIT Press.



#### **Total Credits: 2 Total Instructions Hours:** 48 h

#### S.No

#### List of Experiments

- 1 Operators
- 2 Data frames
- 3 Matrix
- 4 Functions
- 5 Import and Export Files
- 6 Linear and Logistic Regression
- 7 Visualizing Data
- 8 Hypothesis Testing
- 9 File management tasks in Hadoop
- **10** Big data in MongoDB
- **11** Hive to create, alter, and drop databases, tables
- 12 Pig Latin script to Read and Store Data

Note: Out of 12 – 10 Mandatory



# CORE PRACTICAL: MOBILE APPLICATION DEVELOPMENT

# SEMESTER V

# **Total Credits:** 2

Total Instructions Hours: 48h

S.No

List of Experiments

- **1** Login Page Creation
- 2 Menu Creation
- 3 Font and Colors
- 4 GUI components
- 5 Layout Managers and Event listeners.
- 6 GPS location
- 7 Alert messages
- 8 Alarm clock
- **9** Graphical primitives
- **10** Navigation pages
- **11** Street vendor App
- **12** Super market App

Note: Out of 12 - 10 Mandatory



Course Code	Course Name	Category	L	T	Р	Credit
194IT1A5DA	<b>5G MOBILE NETWORKS</b>	DSE	4	I	I	4

This course has been designed for students to learn and understand

- the basics of 5G and Beyond Wireless communication •
- the key technologies and enablers of 5G and beyond communication systems •
- device communication and LTE wave communication •

#### **COURSE OUTCOMES**

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

CO Number	CO Statement	Knowledge Level
CO1	Distinguish and understand the major cellular communication standards (1G/2G/3G/4G/5G systems) and wireless communications networks.	K1
CO2	Understand the 5G functional and physical architecture and its requirements	K2
CO3	Describe the requirements and fundamental techniques for 5G Communication.	K3
CO4	Implementation options for 5G & Compare and explain various radio access technologies for 5G networks	K3
CO5	Apply of Machine Learning in 5G Wireless Communications.	K4

# MAPPING WITH PROGRAMME OUTCOMES

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

Strong S

Medium Μ

L



SEMESTER V

#### **Total Credits:** 4

Total Instruction Hours: 48 h

# Syllabus

Unit IMobile Wireless Technology Generations10 h

5G – From History to the Present and Future-WISDOM - Global Information Multimedia Communication Village- Requirements of 5G- Standardization of WISDOM. SMNAT as Enabler of Device-to-Device Communication : 5G Communication Landscape - Cellular Device-to-Device Communication-D2D Using Physical Layer Network Coding-Network Architecture and the Processes-Implementation of SMNAT for In-Band–D2Dand Interoperability with WISDOM

# **Unit II** Dynamic Spectrum Management And Mm-Waves 10 h

Command and Control Method-Spectrum Sharing-Spectrum Trading-Cognitive Radio. Cyber Security and Threats : Major Challenges Surrounding Future Cyber Security-BEYOND 2020 : Future Mobile Technologies-High Altitude Stratospheric Platform Station Systems-CONASENSE.

**Unit III** Drivers For 5G

Introduction : Pillars of 5G -Evolution of Existing RATs:The 5G Internet: Introduction - Internet of Things and Context-Awareness -Internet of Things-Context-Awareness-Networking Reconfiguration and Virtualization Support -Mobility-Quality of Service Control- Emerging Approach for Resource Over-Provisioning.

# Unit IV5G Small Cells For 5G Mobile Networks10 h

Introduction: What are Small Cells?-Capacity Limits and Achievable Gains with Densification. Cooperation for Next Generation Wireless Networks: Cooperative Diversity and Relaying Strategies- -PHY Layer Impact on MAC Protocol Analysis.

**Unit V** The Wireless Spectrum Crunch: White Spaces For 5G 08 h

Introduction: TV White Space Technology - White Space Spectrum Opportunities and Challenges. Towards a Unified 5G Broadcast-Broadband Architecture: The Spectrum Dimension -SON Evolution for 5G Mobile Networks- SON in UMTS and LTE The Need for SON in 5G- Evolution towards Small-Cell Dominant HetNets-Green Flexible RF for 5G : Radio System Design.



- 1 Ramjee Prasad, 2016, "5G: 2020 and Beyond", Rivers Publications
- 2 Jonathan Rodriguez, 2015, "Fundamentals of 5G Mobile Networks", John Wiley & Sons.

# References

- 1 AsifOseiran, Jose F.Monserrat and Patrick Marsch, 2016, "5G Mobile and Wireless Communications Technology", Cambridge University Press.
- R. Vannithamby and S. Talwar, 2017, "Towards 5G: Applications,
   Requirements and Candidate Technologies", John Willey & Sons, West Sussex.

Martin Sauter "From GSM From GSM to LTE-Advanced Pro and 5G:An Introduction to Mobile Networks and Mobile Broadband", Wiley-Blackwell.

4 AfifOsseiran, Jose.F.Monserrat, Patrick Marsch, "Fundamentals of 5G Mobile Networks", Cambridge University Press.



Course Code	Course Name	Category	L	Т	Р	Credit
194IT1A5DB	NEXT GENERATION DATABASE	DSE	4	I	-	4

This course has been designed for students to learn and understand

- The fundamental elements of relational database management systems
- Concepts of Graph Databases, Column Databases
- The New Generation databases MongoDB.

#### **COURSE OUTCOMES**

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

CO Number	CO Statement	Knowledge Level
CO1	Understand basic concepts and terminology related to DBMS and Database revolution Design.	K1
CO2	Learn Sharding and NoSQL	K1,K2
CO3	Understand Graph Databases, Column Databases	K2,K3
CO4	Acquire Knowledge on Distributed database Pattern	K3
CO5	Learn Data models and storage	K3

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



### **Total Credits:** 4

SEMESTER V

#### Total Instruction Hours: 48 h

#### Syllabus

Unit I	Three Database Revolutions	8	h
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Early Database Systems - The First Database Revolution - The Second Database Revolution - The Third Database Revolution. Google, Big Data, and Hadoop : The Big Data Revolution - Google: Pioneer of Big Data - Hadoop: Open-Source Google Stack

	Jnit II	Sharding, Amazon, and the Birth of NoSQL	10 h
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Scaling Web 2.0 - Amazon's Dynamo. Document Databases: XML and XML Databases - JSON Document Databases.

## Unit IIIGraph Databases, Column Databases10 h

Data Warehousing Schemas - The Columnar Alternative - Sybase IQ, C-Store, and Vertica - Column Database Architectures.

# Unit IVDistributed Database Patterns12 h

Distributed Relational Databases - Nonrelational Distributed Databases - MongoDB Sharding and Replication - Hbase - Cassandra. Consistency Models: Types of Consistency - Consistency in MongoDB - HBase Consistency - Cassandra Consistency.

Unit VData Models and Storage8 h

Data Models – Storage, Languages and Programming Interfaces: SQL- NoSQL APIs - The Return of SQL.



1 Guy Harrison, 2015, "Next Generation Databases : NoSQL and Big Data", First APress Edition,

# References

1 Kristina Chodorow, "MongoDB – The Definitive Guide", 2nd edition, O'Reilly

Pramod Sadalage and Martin Fowler, "NoSQL Distilled: A Brief Guide to the

2 Emerging World of Polyglot Persistence", 1st Edition, Addison-Wesley Professional



Course Code	Course Name	Category	L	T	Р	Credit
194IT1A5DC	DEEP LEARNING	DSE	4	-	-	4

This course has been designed for students to learn and understand

- the foundations of Deep Learning.
- the knowledge on Deep Learning Concepts
- optimization strategies to perform experiments in Deep Learning using realworld data.

# **COURSE OUTCOMES**

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

CO Number	CO Statement	Knowledge Level
CO1	Apply knowledge of machine and deep learning algorithms	K3
CO2	Implement Deep Feed Forward Networks and algorithms	K1
CO3	Construct the Learning Networks in modeling real world systems of Convolutional Networks	K3
CO4	Explain the Concepts of Recurrent Neural Networks	K3
CO5	Apply optimization strategies for large scale applications with Deep Generative Models	K4

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



# Total Credits: 4

# Total Instruction Hours: 48 h

#### Syllabus

#### **Unit I** Introduction To Deep Learning

Introduction to Deep Learning- Historical Trends in deep learning – Machine learning basics- Learning Algorithms- Capacity, Overfitting and Underfitting-Supervised Learning Algorithms- Unsupervised Learning Algorithms- Stochastic Gradient Descent- Building a Machine Learning Algorithm- Challenges Motivating Deep Learning.

Unit II Applications of Deep Learning & Deep Feed forward 10 h Networks

Applications: Large-Scale Deep Learning - Computer - Speech Recognition -Natural Language Processing - Other Applications. Deep Feedforward Networks: Gradient Descent, Hidden Units- Architecture Design-Backpropagation and other algorithms.

#### Unit III Convolutional Networks

Convolutional Networks: The Convolution Operation - Variants of the Basic Convolution Function - Structured Outputs - Data Types - Efficient Convolution Algorithms - Random or Unsupervised Features- LeNet, AlexNet.

**Unit IV** Recurrent Neural Networks

Recurrent Neural Networks: Bidirectional RNNs - Deep Recurrent Networks Recursive Neural Networks - The Long Short-Term Memory and Other Gated RNNs.

#### **Unit V** Deep Generative Models

Deep Generative Models: Boltzmann Machines - Restricted Boltzmann Machines -Deep Belief Networks- Deep Boltzmann Machines- Convolutional Boltzmann Machines- Evaluating Generative Models.



SEMESTER V

10 h

10 h

08 h

1 Ian Goodfellow, Yoshua Bengio, Aaron Courville, 2016, "Deep Learning", MIT Press.

- 1 Jeff Heaton, 2015, "Deep Learning and Neural Networks", Heaton Research Inc.
- 2 Mindy L Hall, 2011, "Deep Learning", VDM Verlag.
- **3** Li Deng , Dong Yu, 2009,"Deep Learning: Methods and Applications (Foundations and Trends in Signal Processing)", Now Publishers Inc



Course Code	Course Name	Category	L	Т	Р	Credit
192MT1A5AA	<b>RESEARCH METHODOLOGY</b>	AECC	2	-	-	2

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

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



**Total Credits:** 2

## Total Instruction Hours: 24 h

#### **Syllabus**

**Unit I** Introduction Research

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

Unit IIIExperimentationand research5 h

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

Unit IV S	Scientific method and Research Design	4 h
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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 - unethics to ethics in research - responsibility of Scientists and of Science as an Institution



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

- 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 Course Name	тт		D	Exam	Ma	ax Ma	rks	Cradits	
Course Coue	Category	Course Maine	L	I	I	(h)	CIA	ESE	Total	Cleuits
Sixth Semester										
194IT1A6CA	Core - XI	PHP and MYSQL	4	-	-	3	25	75	100	4
194IT1A6CB	Core - XII	Cloud Computing	4	-	-	3	25	75	100	4
194IT1A6CP	Core Practical -IX	PHP and MYSQL	-	-	4	3	40	60	100	2
194IT1A6CV	Core - XIII Project	Project Work	-	-	8	3	40	60	100	4
194IT1A6DA		Software Testing								
194IT1A6DB	DSE -II	Augmented Reality and Virtual Reality	4	-	-	3	25	75	100	4
194IT1A6DC		Robotics								
194IT1A6DD		Routing and Switching								
194IT1A6DE	DSE -III	Blockchain Technology	4	-	-	3	25	75	100	4
194IT1A6DF		Data Visualization								
Part - IV										
193BC1A6AA	AECC - VI	Innovation, IPR and Entrepreneurship	2	-	-	3	-	50	50	2
Part - V										
194IT1A6XA		Extension Activity	-	-	-	-	-	-	50	1
Total 18 - 12						700	25			
Grand Total						4200	140			



Course Code	Course Name	Category	L	Т	Р	Credit
194IT1A6CA	PHP AND MYSQL	CORE	4	-	-	4

This course has been designed for students to learn and understand

- The concepts of web applications using PHP
- The databases in MySQL
- The idea about String and Array concepts

## **COURSE OUTCOMES**

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic concepts of PHP programming.	K1
CO2	Build knowledge about the string, array and functions	K2
CO3	Apply the web programming knowledge	К3
CO4	Examine the application related to browser	K3
CO5	Synthesize to work with MYSQL and NOSQL	K2

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



#### **Total Credits:** 4

#### Total Instruction Hours: 48 h

#### Syllabus

#### Unit I **Introduction to PHP**

Essential PHP: Enter PHP - Creating your development environment- creating and running first PHP-mixing HTML and PHP - printing some text - adding comments to PHP code - working with variables - creating variable variables - creating constants - internal data types - Operators

#### Unit II Strings, Array and Function

Strings and Array: The string functions, converting to and from strings - formatting text strings - building yourself some arrays - modifying the data in arrays - deleting array elements Creating Functions - Creating function in PHP, Passing functions some data - introducing variable scope in PHP - Accessing global data, working with static variables - PHP conditional functions - PHP variable functions - nesting functions - creating include files - returning errors from functions.

#### Unit III Handling Webpages

Reading Data in Web Pages - Setting up web pages to communicate with PHPhandling text fields- handling text areas - handling check boxes - handling radio buttons - handling list boxes -handling password controls - handling hidden controls - handling image maps - handling file uploads - handling buttons.

Unit IV PHP Browser and File handling 10 h

PHP Browser : Handling Power - using PHP server variable, using HTTP Headersgetting browser type, redirecting browsers with HTTP headers- Dumpling a form's data all once- Handling form data with custom array- performing data validationchecking the user entered data, requiring numbers- requiring text- persisting user data- File handling.

#### Unit V Working with databases

Working with databases: What is database, creating a MySql databases-NOSQL : Creating Records - Accessing Data - Updating and Deleting Data- Comparing NOSQL Products.



10 h

10 h

SEMESTER VI

08 h
- 1 Steven Holzner, 2008, "Complete Reference PHP", Tata Mc Graw Hill, (UNIT I,II,III,IV).
- 2 Shashank Tiwari, 2011, "Professional NOSQL", John Wiley & Sons Publications (UNIT V)

- 1 Steve Suehring, Tim Converse, Joyce Park, 2009, "PHP6 MySQL", (Bible).
- 2 Vikram Vaswani, 2004, "The Complete Reference of MySql", Tata McGraw Hill Publications.
- 3 Luke Welling ,2016, "PHP and MySQL Web Development", Addison-Wesley
- 4 Mike McGrath, 2018, "PHP & MySQL in easy steps", In Easy Steps Limited



Course Code	Course Name	Category	L	Т	Р	Credit
194IT1A6CB	CLOUD COMPUTING	CORE	4	-	-	4

This course has been designed for students to learn and understand

- The basics of cloud computing
- Cloud-based services & Technologies
- Cloud Security

# **COURSE OUTCOMES**

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the characteristics of Cloud Computing	K1
CO2	Identify Cloud services and Technologies	K2
CO3	Analyze Cloud Platforms	K3
CO4	Design the Cloud Methodologies	K4
CO5	Understand Cloud Security	K2

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



SEMESTER VI

### Total Instruction Hours: 48 h

#### Syllabus

# Unit IIntroduction to Cloud Computing08 h

Definition - Characteristics of Cloud Computing - Cloud Models: Service Models-Deployment Models - Cloud Services Example : IaaS- PaaS-SaaS

Ilmit II	Cloud-based	Services	&	Application,	Concepts	&	10 h
	Technologies						10 II

Cloud Computing for Healthcare - Energy Systems-Transportation Systems-Manufacturing Industry-Government-Education-Mobile Communication.

Cloud Concepts & Technologies: Virtualization- Load Balancing- Scalability & Elasticity- Deployment- Replication - Monitoring - Software Defined Networking-Network Function Virtualization- MapReduce- Identity and Access Management-Service level Agreements- Billing.

10 h

Compute Services - Storage Services- Database Services- Application Services-Content Delivery Services- Analytics Services- Deployment & Management Services- Identity and Access Management Services- Open Source Private Cloud Software

Unit IVDeveloping for Cloud10 h

Cloud Application Design- Reference Architectures for Cloud Applications- Cloud Application Design Methodologies- Data Storage Approaches.

Unit V Cloud Security

Introduction- CSA Cloud Security Architecture- Authentication-Identification & Access Management - Data Security- Key Management- Auditing.



10 h

1 Arshdeep Bahga, Vijay Madisetti, 2014, "Cloud Computing - A Hands-on Approach", Universities Press.

- 1 Thomas Erl, Zaigham Mahmood, Richard Puttini, 2019, "Cloud Computing Concepts, Technology and Architecture", Pearson Education.
- 2 Dan C. Marinescu, 2018, "Cloud Computing Theory and Practice", Morgan Kauffmann.
- 3 Michael Miller, 2019, "Cloud Computing Web based Applications that Change the Way You Work and Collaborate Online", Pearson Education.
- **4** Erl, 2014, "Cloud Computing: Concepts, Technology & Architecture", Pearson Edition.



# CORE PRACTICAL: PHP AND MYSQL

# **Total Credits: 2**

# Total Instructions Hours: 48h

S.No

# List of Experiments

- **1** HTML formatted Email in PHP.
- **2** Types of Sorting in PHP.
- **3** String Manipulation in PHP.
- 4 Color code with name.
- 5 Calculator functions.
- 6 Upload a file.
- 7 Login authentication.
- 8 Application with DML Queries.
- 9 Communication between webpage and web server.
- 10 Online Job portal.
- **11** Smart city information system.
- **12** Student result portal.

Note: Out of 12 - 10 Mandatory



# Total Instructional Hours 96 h

#### **GUIDELINES:**

- 1. A Guide has been allotted to each student by the department. Student can select any topic in discussion with the supervisor. Students should maintain a work diary were in weekly work carried out has to be written. Guide should review the work every week and put his/her signature. The work diary along with project report should be submitted at the time of viva voce.
- 2. CA Marks Distribution: A minimum of three reviews have to be done, one at the time finalizing the project title, second at framing questionnaire/identifying the primary data and the third review at the time of commencement of report writing. They should be asked to present the work done to the respective guide in the three reviews. The guide will give the marks for CIA as per the norms stated below:

First Review	10 Marks
Second Review	10 Marks
Third Review	10 Marks
Document, Preparation and Implementation	10 Marks
Total	40 Marks

3. End Semester Examination: The evaluation for the end semester examination should be as per the norms Given Below:

Record work and Presentation		40 Marks
Viva-Voce		20 Marks
Tota	al	60 Marks

Note: (End Semester Examination marks jointly given by the external and internal examiner).



Dr.NGPASC

COIMBATORE | INDIA

Course Code	Course Name	Category	L	T	Р	Credit
194IT1A6DA	SOFTWARE TESTING	DSE	4	-	-	4

This course has been designed for students to learn and understand

- The fundamental concepts in software testing
- Various software testing issues and solutions in software unit test, integration and system testing.
- Different software testing techniques and strategies

# **COURSE OUTCOMES**

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic concepts and the processes that lead to software testing	K1
CO2	Design test cases from the given requirements using Black box testing techniques	К3
CO3	Identify the test cases from Source code by means of white box testing techniques	K2
CO4	Demonstrate user acceptance testing and generate test cases for it	K3
CO5	Outline the test adequacy criteria to complete the testing process	К2

COs/POs	PO1	PO2	PO3	PO4	PO5	
CO1	S	М	S	М	S	
CO2	М	М	S	S	М	
CO3	М	S	М	М	S	
CO4	S	М	S	М	S	
CO5	М	М	S	S	М	
S Stroi	S Strong M Medium L Low					



SEMESTER VI

10 h

10 h

### Total Instruction Hours: 48 h

#### Syllabus

Unit ISoftware Development Life Cycle Models10 h

Software Development Life Cycle models: Phases of Software project – Quality, Quality Assurance, Quality control – Testing, Verification and Validation – Process Model to represent Different Phases - Life Cycle models. White-Box Testing: Static Testing – Structural Testing – Challenges in White-Box Testing.

Unit II Black-Box Testing

Black-Box Testing: What is Black-Box Testing - Why Black-Box Testing - When to do Black Box Testing - How to do Black-Box Testing - Challenges in Black Box Testing - Integration Testing: Integration Testing as Type of Testing - Integration Testing as a Phase Testing - Scenario Testing - Defect Bash.

Unit IIISystem And Acceptance Testing08 h

System and Acceptance Testing: system Testing Overview – Why System testing is done – Functional versus Non-functional Testing – Functional testing – Non-functional Testing – Acceptance Testing – Summary of Testing Phases.

**Unit IV** Performance Testing

Factors governing Performance Testing – Methodology of Performance Testing – tools for Performance Testing – Process for Performance Testing – Challenges. Regression Testing: What is Regression Testing? – Types of Regression Testing – When to do Regression Testing – How to do Regression Testing – Best Practices in Regression Testing.

**Unit V** Test Planning, Management, Execution And Reporting 10 h

Test Planning, Management, Execution and Reporting: Test Planning – Test Management – Test Process – Test Reporting –Best Practices. Test Metrics and Measurements: Project Metrics – Progress Metrics – Productivity Metrics – Release Metrics



**1** Srinivasan Desikan & Gopalswamy Ramesh, 2018, "Software Testing Principles and Practices", Pearson Education.

- 1 Aditya P.Mathur, 2013, "Foundations of Software Testing", 2nd Edition, Pearson Education.
- 2 William E. Perry, "Effective Methods of Software Testing", 3rd Edition, Wiley India.
- <sup>3</sup> Renu Rajani, 2007, "Software Testing", Pradeep Oak, Tata McGraw Hill.
- **4** Limaye M.G., 2010, "Software Testing Principles, Techniques and Tools", Second Reprint, Tata McGraw Hill Publisher.



Course Code	Course Name	Category	L	Т	Р	Credit
194IT1A6DB	AUGMENTED REALITY AND VIRTUAL REALITY	DSE	4	-	l	4

This course has been designed for students to learn and understand

- Fundamental computer vision, computer graphics and human-computer interaction techniques related to VR/AR.
- Geometric modeling and Virtual environment.
- Various types of Hardware and software in virtual Reality systems

# **COURSE OUTCOMES**

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

СО	CO Statement	Knowledge
Number	CO Statement	Level
CO1	Design, create, and integrate audio, visual, and interactive elements into a comprehensive immersive experience.	K3
CO2	Develop content for successful delivery across multiple platforms, including PC, mobile devices and head- mounted displays	K4
CO3	Evaluate current trends of AR and VR media delivery to propose options to potential clients, and discuss the benefits, challenges and misconceptions involved with working in AR and VR.	K2
CO4	Evaluate various interaction schemes common to AR/VR experiences.	K4
CO5	Use immersive effects of visual and audio assets to AR/VR experiences and evaluate implementation methods.	K3

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



SEMESTER VI

## Total Instruction Hours: 48 h

#### Syllabus

#### **Unit I** Introduction to Virtual Reality

What is VR-Modern experiences-History.Bird's Eye View:Hardware- displays-Software-game engines- human senses.The Geometry of Virtual Worlds: Geometric models-yaw, pitch, roll, axis-angle representation- quaternions- 3D rotation inverses and conversions-canonical view and perspective transforms.

#### **Unit II** Light and Optics

Basic Behavior of Lights: lenses and images- diopters- spherical aberrations- optical distortion- more lens aberrations- spectral properties- the eye as an optical system-cameras- visual displays. The Physiology of Human Vision: Parts of the human eye-photoreceptors and densities- display resolution requirements- eye movements-Implications of VR.

#### Unit III Motion in Real and Virtual Worlds 08 h

Velocities and Acceleration- vestibular system- virtual world physics- simulationcollision detection- motion and vection. Interaction: Remapping- locomotionmanipulation- social interaction. Audio:Sound propagation-Human Hearing.

### Unit IV Augmented Reality 10 h

Introduction: What is Augmented Reality - Augmented Reality - The Relationship Between Augmented Reality and Other Technologies - Augmented Reality Concepts - Augmented Reality Concepts - Ingredients of an Augmented Reality Experience - Augmented Reality Hardware - Augmented Reality Software.

# Unit VInteraction in Augmented Reality10 h

Introduction- What Is Interaction?- Interaction in the Real World- Mobile Augmented Reality- Advantages and Disadvantages of Mobile Augmented Reality-Augmented Reality Applications- Application Areas- Evaluating Augmented Reality Applications- Example Augmented Reality Applications



10 h

10 h

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- 1 Steven M. LaValle, 2020, "Virtual Reality", Cambridge University Press, UNIT(I,II,III)
- 2 Alan B. Craig, 2013, "Understanding Augmented Reality, Concepts and Applications", Morgan Kaufmann, (UNIT IV,V)

- **1** Paul Mealy, 2018, "Virtual & Augmented Reality For Dummies".
- 2 Jonathan Linowes, Jesse Glover, 2019, "Complete Virtual Reality and Augmented Reality", Packt Publications.
- **3** D. Schmalstieg and T. Höllerer., 2016, "Augmented Reality: Principles and Practice", Addison-Wesley, Boston.
- 4 Alan Craig, William Sherman and Jeffrey Will, 2009, "Developing Virtual Reality Applications, Foundations of Effective Design", Morgan Kaufmann.



Course Code	Course Name	Category	L	Т	Р	Credit
194IT1A6DC	ROBOTICS	DSE	4	l	-	4

This course has been designed for students to learn and understand

- Basics and Classification of Robotics
- Architecture and Hardware
- Robot Languages and Programming

# COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the history and applications of Robotics	K1
CO2	Know the concepts of actuators and grippers	K2
CO3	Understand various types of sensors and vision	K1
CO4	Learn various circuits used in Robots	K2
CO5	Design the architecture of Robot programming	K3

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



158

#### **Total Credits:** Δ

# Total Instruction Hours: 48 h

#### **Syllabus**

Unit I Introduction to Robotics

History- Robots- Robot Usage- Industrial Robots: Robot Subsystem - Motion Subsystem- Recognition Subsystem - Control Subsystem.

Classification of Robots: Coordinate Systems- Actuation Systems- Control Methods-Robot Programming. Industrial Applications: Material Handling- Welding- Spray Painting - Machining - Assembling.

Unit II Actuators and Grippers

Electric Actuators : DC Motors - AC Motors - Linear Actuators-Hydraulic Actuators -Pneumatic Actuators-Selection of Motors

Unit III Sensors and Vision

Sensor Classification - Internal Sensors: Velocity Sensors - Acceleration Sensors -Force Sensors. External Sensors: Contact type - non-contact type. Vision: Elements in a Vision Sensor- Steps in a Vision System- Hierarchy of a Vision System-Difficulties in Vision and Remedies.

Unit IV	Signal Conditioning	10 h
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**Filters-Modulators** and Digital Amplifiers-Demodulators-Analog and Conversions- Bridge Circuits- Signal Analyzer - Sensor Selection.

Unit V 10 h Transformations and Robot Programming

Robot Architecture: Links and Joints-Kinematic Chain-Degree of Freedom.

Robot Languages: Different Robot Languages-Generations-Structure-Requirements- Problems-Robot Programming: Online Programming-Offline Programming - Robot Oriented Programming - Task-level Programming



10 h

08 h

**1** S K Saha, 2014, "Introduction to Robotics", McGraw Hill Education.

- **1** J.Srinivas, R.V.Dukkipati, K. Ramji, 2012, "Robotics Control and Programming", Narosa Publishing House.
- **2** John J. Craig, 2016, "Introduction to Robotics Mechanics and Control", Pearson Education.
- **3** Chi N. Thai, 2017, "Exploring Robotics with ROBOTIS Systems", Springer; 2nd Edition.
- **4** Robin R. Murphy, 2019, "Introduction to AI Robotics", Kindle Edition, 2nd Edition.



Course Code	Course Name	Category	L	Т	Р	Credit
194IT1A6DD	ROUTING AND SWITCHING	DSE	4	-	-	4

This course has been designed for students to learn and understand

- basics of Routing and Switching
- the concept of VLANs, its Protocols and its Design
- the perception of Routing and Switching Protocols

# **COURSE OUTCOMES**

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

CO Number	CO Statement	Knowledge Level
CO1	Classify the Basics of Switched networks	К2
CO2	Explain the concept of VLAN	К2
CO3	Apply the basic routing concepts	K2,K3
CO4	Demonstrate the layers in Switching	К3
CO5	Apply the knowledge in Routing Protocols	К3

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



SEMESTER VI

08 h

10 h

10 h

#### Total Instruction Hours: 48 h

#### Syllabus

#### **Unit I** Introduction to Switched Networks

Objectives - Key Terms - Introduction- LAN Design - The Switched Environment. Basic Switching Concepts and Configuration : Basic Switch Configuration, Configure Switch Ports

Unit II VLANs

Introduction ,VLAN Segmentation , VLAN Definitions , Benefits of VLANs , Types of VLANs ,Data VLAN , Default VLAN , Native VLAN , Management VLAN , Voice VLANs , VLAN Trunks, Dynamic Trunking Protocol, VLAN Security and Design

### Unit III Routing Concepts 10 h

Functions of a Router, Characteristics of a Network, Routers Interconnect Networks, Routers Choose Best Paths, Connect Devices, Basic Settings on a Router, Switching Packets Between Networks, Analyze the Routing Table

Unit IV Switching

Introduction to Layer 3 Switching, Troubleshoot Layer 3 Switching, Inter-VLAN Routing with Switch Virtual Interfaces, Routed Ports and Access Ports on a Switch.

**Unit V** Routing Dynamically 10 h

Dynamic Routing Protocol Operation, Dynamic Versus Static Routing, Routing Protocol Operating Fundamentals, Types of Routing Protocols, Distance Vector Routing Protocol Operation, Types of Distance Vector Routing Protocols



1 Cisco Network Academy, 2014, "Routing and Switching Essentials", First Edition.

# References

- 1 Bruce Hartpence, 2011, "Packet Guide to Routing and Switching", O'Reilly Media, First Edition.
- 2 Narbik Kocharians, 2018, "CCIE Routing and Switching V5.1 Foundations: Bridging the Gap Between CCNP and CCIE", Pearson Education.
- 3 Cisco Networking Academy ,2014, "Routing Protocols Companion Guide", Pearson Education, India.
- 4 Todd Lammle, 2016, "CCNA Routing and Switching Complete Study Guide", Sybex 2nd Edition.



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Course Code	Course Name	Category	L	Т	Р	Credit
194IT1A6DE	<b>BLOCKCHAIN TECHNOLOGY</b>	DSE	4	I	-	4

This course has been designed for students to learn and understand

- The concepts of Blockchain Technology
- The Technology use cases & Ethereum
- The Fast-track applications & private blockchain platforms

### **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 Blockchain Technology	K2	
CO2	Remember the Technology Use cases	K1	
CO3	Classifying the Technology on Ethereum	K2	
CO4	Apply Blockchain concepts to create Fast-Track applications	КЗ	
CO5	Interpreting Blockchain platforms & its challenges	K2	

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



# Total Instruction Hours: 48 h

#### Syllabus

#### **Unit I** Introduction to Blockchain

Blockchain: An Information Technology-Satoshi Nakamoto's Blockchain Breakthrough-Types of Blockchain – Blockchain Implementations-Blockchain Collaborative Implementations -Blockchain in Practical Use Today

#### **Unit II** Technology Use Cases

Web Versions 1 and 2-Web 3.0-Distributed Storage Systems-Distributed Computation-Golem-Decentralized Communications-The beginning of Autonomous Law-Smart contract Design example-DAO and Jurisdiction

Unit III Technology on Ethereum

Ethereum Accounts-Ether the Cryptocurrency-Obtaining Ether-Mining in Ethereum-Ethereum Work-Decentralized Applications-Profile of a Dapp-Decentralized Autonomous Organizations

### **Unit IV** Fast-Track Application

Introducing Solidity-Run Ethereum Dapps in Your Browser-Develop a Simple Smart Contract-Ethereum Blockchain Development-Ethereum Blockchain Development

**Unit V** Private Blockchain Platforms, Use Cases& Challenges 10 h

Categories of Blockchain - Private Blockchain Use Cases-Private Blockchain Technology-Chain Core-Corda-Blockchain Governance Challenges-Blockchain Technical Challenges



10 h

8 h

10 h

10 h

Joseph J. Bambara Paul R. Allen, 2018, "Blockchain-A practical guide to 1 developing business, law, and Technology Solutions", McGraw Hill Education.

- **1** Melanie Swan, 2015, "Blockchain blueprint for a new economy", O'Reilly.
- <sup>2</sup> Tiana Laurence, 2017, "Blockchain for Dummies", John Wiley & Sons, Inc.
- **3** Chandramouli Subramanian, Asha A George, Abhilash K A, Meena Karthikeyan, 2020, "Blockchain Technology", Universities Press, India.
- 4 Jai Singh Arun, 2019, "Blockchain for Business" Pearson Education.



Course Code	Course Name	Category	L	Т	Р	Credit
194IT1A6DF	DATA VISUALIZATION	CORE	4	I	-	4

This course has been designed for students to learn and understand

- The concept of Data and its manipulation
- Analyzing the Visualization
- Apply visualization techniques for various data analysis tasks

# **COURSE OUTCOMES**

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

СО		Knowledge
Number	CO Statement	Level
CO1	Understand the concepts on manipulations in Data Frame	K2
CO2	Design various Visualization Techniques	K3
CO3	Creating interactive Bar plots and Heatmaps	K3
CO4	Apply the Knowledge on Numpy and Matplotlib	К3
CO5	Develop visualizing images, shapes, graphs and networks	K4

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



SEMESTER VI

# Total Instruction Hours: 48 h

### Syllabus

**Unit I** Introduction to Visualization with Python 10 h

Introduction-Handling Data with pandas DataFrame: Reading Data from Files -Observing and Describing Data- Selecting Columns from a DataFrame - Adding New Columns to a DataFrame - Applying Functions on DataFrame Columns -Deleting Columns from a DataFrame - Writing a DataFrame to a File- Plotting with pandas and seaborn: Creating Simple Plots to Visualize a Distribution of Variables -Bar Plots -Tweaking Plot Parameters

Unit II Static Visualization – Global Patterns and Summary Statistics 10 h

Introduction- Creating Plots that Present Global Patterns in Data : Scatter Plots -Hexagonal Binning Plots - Contour Plots - Line Plots - Heatmaps- The Concept of Linkage in Heatmaps- Creating Plots That Present Summary Statistics of Your Data: Histogram Revisited - Box Plots - Violin Plots

Unit IIIStatic to Interactive Visualization10 h

Introduction - Static versus Interactive Visualization - Applications of Interactive Data Visualizations - Getting Started with Interactive Data Visualizations -Interactive Data Visualization with Bokeh - Interactive Data Visualization with Plotly Express - Interactive Scatter Plots

**Unit IV** Data Visualization with NumPy and Matplotlib 10 h

Matplotlib - Visualization with NumPy and Matplotlib -Single Line Plots - Multiline Plots - Grid, Axes, and Labels - Colors, Styles, and Markers.

**Unit V** Visualizing Images, 3D Shapes, Graphs and Networks 08 h

Visualizing the Images - Operations on Images - 3 D Visualizations- Graphs and Networks : Graphs in Python 3 - Visualizing Graphs in Python 3 - More Types of Graphs - Assigning Custom Labels to Nodes.



Abha Belorkar, Sharath Chandra Guntuku, Shubhangi Hora, Anshu Kumar,

- 1 2020, "Interactive Data Visualization with Python", Second Edition, Packt Publishing(Unit I,II,III)
- 2 Ashwin Pajankar, 2021, "Practical Python Data Visualization: A Fast Track Approach To Learning Data Visualization With Python", APress (Unit IV,V)

- 1 Claus O. Wilke, 2019, "Fundamentals of Data Visualization A Primer on Making Informative and Compelling Figures", O'REILLY.
- 2 Robert Johansson, 2019, "Numerical Python: Scientific Computing and Data Science Applications with Numpy, SciPy and Matplotlib", APress.
- 3 David S. Brown, 2021,"Statistics and Data Visualization Using R: The Art and Practice of Data Analysis" SAGE Publications, Inc
- 4 Mario Dobler, Tim Großmann, 2019, "Data Visualization with Python", Packt Publishing Limited.



Course Code	Course Name	Category	L	Т	Р	Credit
193BC1A6AA	INNOVATION, IPR AND ENTREPRENEURSHIP	AECC	2	-	-	2

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	К2
CO4	Acquire knowledge about copyright and copyright law	K2
CO5	Identify Geographical Indications	K2

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



SEMESTER VI

#### **Total Instruction Hours:** 24 h

#### Syllabus

#### Unit I 05 h Introduction to Innovation, IPR and Entrepreneurship

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, decision process. Entrepreneurial Role of Entrepreneurship in Economic Development.

Case Study: Jayabharati Viswanath: A case of Ladel to Leather.

#### Unit II Patents

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

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

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

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 only)



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05 h

05 h

04 h

05 h

- 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.
- <sup>3</sup> http://www.bdu.ac.in/cells/ipr/docs/ipr-eng-ebook.pdf.
- 4 https://knowledgentia.com/knowledgeate.

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