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)

B.Sc. Computer Science Degree

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

Programme: B.Sc. Computer Science

Eligibility:

A candidate who has passed in Higher Secondary Examination with any Academic stream or Vocational stream as one of the subject under Higher Secondary Board of Examination, Tamilnadu as per the norms set by the Government of Tamilnadu or an Examination accepted as equivalent thereto by the Academic Council, subject to such conditions as may be prescribed thereto are permitted to appear and qualify for the B.Sc. Computer Science of this College after a programme of study of threeacademic years.

Programme Objectives:

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

1. To provide adequate basic understanding about Computer Science and its applications.

2. To exploit emerging technologies in Computer Science and its related discipline.

3. To expose adequate training to the computing environment in Software Development, Graphics, Data Mining etc.

4. To inculcate training & practical approach, internship is given to be trained among the students in the field of Computer Science.

5. To equip the students with sufficient exposure and skills to enable them in attaining a deserving position in Software Industry.

PROGRAM OUTCOMES:

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

PO Number	PO Statement
PO1	An ability to apply knowledge of computing and mathematics appropriate to the program's student outcomes and to the discipline.
PO2	An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.
PO3	An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices.
PO4	An understanding of professional, ethical, legal, security and social issues and responsibilities.
PO5	An ability to communicate effectively with a range of audiences.

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

Part	Subjects	No.of Papers	Credit	Semester No.
I	Tamil/ Hindi / French/Malayalam	2	2 x 3 = 6	I & II
II	English	2	2 x 3 = 6	I & II
III	Core (Credits 2,3,4)	18-22	70	I to VI
	Inter Departmental Course (IDC)	4	16	I to IV
	Discipline Specific Elective(DSE)	3	3 x 4 =12	V & VI
	Skill Enhancement Course(SEC)	4	4 x 3=12	III ,IV,V& VI
	Generic Elective(GE)	2	2 x 2=4	III & IV
	Lab on Project (LoP)	1	1	III to VI
IV	Environmental Studies(AECC)	1	2	I
	Value Education (VE) (Human Rights, Women's Rights) (AECC)	2	4	II and III
	General Awareness(On-Line Exam) (AECC)	1	2	IV
	Research Methodology (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**	

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CURRICULUM

B.Sc COMPUTER SCIENCE PROGRAMME

Course Code	Course Category	Course Name	L	T	P	Exam (hours)	Max Marks			Credits
							CIA	ESE	Total	
First Semester										
Part – I										
191TL1A1TA	Language - I	Tamil-I	4	1	0	3	25	75	100	3
191TL1A1HA		Hindi-I								
191TL1A1MA		Malayalam-I								
191TL1A1FA		French – I								
Part – II										
191EL1A1EA	English - I	English – I	4	0	1	3	25	75	100	3
Part – III										
194CT1A1CA	Core - I	Problem Solving Using C Programming	4	1	0	3	25	75	100	4
194CS1A1CP	Core Practical- I	C Programming	0	0	4	3	40	60	100	2
194CS1A1CQ	Core Practical - II	Linux	0	0	4	3	40	60	100	2
192MT1A1IB	IDC - I	Discrete Mathematical Structures	4	1	0	3	25	75	100	4
Part - IV										
193MB1A1AA	AECC- I	Environmental Studies	2	0	0	3	-	50	50	2
Total			**18**	**3**	**9**	-	-	-	**650**	**20**

10/4/2019

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

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

10/4/2019

Dr.NGPASC
COIMBATORE | INDIA

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

Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
Second Semester										
Part - I										
191TL1A2TA	Language - II	Tamil-II	4	1	0	3	25	75	100	3
191TL1A2HA		Hindi-II								
191TL1A2MA		Malayalam-II								
191TL1A2FA		French – II								
Part – II										
191EL1A2EA	English - II	English – II	4	0	1	3	25	75	100	3
Part – III										
194CA1A2CA	Core -II	Data Structures	4	1	0	3	25	75	100	4
194CS1A2CB	Core- III	C++ Programming	4	1	0	3	25	75	100	4
194CS1A2CP	Core Practical -III	Data Structures using C++	0	0	4	3	40	60	100	2
192PY1A2IB	IDC - II	Digital Electronics	4	0	0	3	25	75	100	4
Part - IV										
196BM1A2AA	AECC - II	Human Rights	2	0	0	3	-	50	50	2
		Total	**22**	**3**	**5**	**-**	**-**	**-**	**650**	**22**

Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
Third Semester										
194IT1A3CA	Core - IV	Java Programming	4	0	0	3	25	75	100	4
194CT1A3CA	Core -V	Operating Systems	4	1	0	3	25	75	100	4
194CS1A3CP	Core Practical- IV	Java Programming	0	0	4	3	40	60	100	2
192MT1A3IC	IDC - III	Numerical Methods and Statistics	4	1	0	3	25	75	100	4
194CS1A3SA	SEC-I	Web Designing	4	0	0	3	25	75	100	4
194CS1A3SP	SEC Practical -I	Web Designing	0	0	4	3	40	60	100	2
	GE – I		2	-	-	2	-	50	50	2
	LoP	Lab on Project	-	-	-	-	-	-	-	-
Part - IV										
191TL1A3AA	AECC - III	Basic Tamil	2	-	-	3	-	50	50	2
191TL1A3AB		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	194CS1ASSA	Data Science and Big Data Analytics
2	194CS1ASSB	Enterprise Resource Planning

Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
Fourth Semester										
Part – III										
194CS1A4CA	Core -VI	Agile Methodology	4	1	0	3	25	75	100	4
194IT1A4CA	Core -VII	Relational Database Management System	4	1	0	3	25	75	100	4
194CS1A4CP	Core Practical - V	Relational Database Management System	0	0	4	3	40	60	100	2
195CI1A4IB	IDC - IV	Fundamentals of Accounting	4	0	0	3	25	75	100	4
194CS1A4SA	SEC – II	Python Programming	4	0	0	3	25	75	100	4
194CS1A4SP	SEC Practical -II	Python Programming	0	0	4	3	40	60	100	2
	GE – II		2	0	0	2	-	50	50	2
	LoP	Lab on Project	-	-	-	-	-	-	-	-
Part - IV										
191TL1A4AA	AECC - IV	Basic Tamil	2	0	0	3	-	50	50	2
191TL1A4AB		Advanced Tamil								
192PY1A4AA		General Awareness								
		Total	**20**	**2**	**8**	**-**	**-**	**-**	**700**	**24**

Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
Fifth Semester										
Part – III										
194CT1A5CA	Core -VIII	Data Communication and Networks	4	0	0	3	25	75	100	4
194CS1A5CA	Core- IX	C# Programming	4	0	0	3	25	75	100	4
194CS1A5CB	Core -X	Computer Graphics	3	1	0	3	25	75	100	3
194IT1A5CB	Core -XI	Cyber Crime and Digital Forensic	4	0	0	3	25	75	100	4
194CS1A5CP	Core Practical- VI	Programming in C#	0	0	4	3	40	60	100	2
194CS1A5CQ	Core Practical - VII	Computer Graphics	0	0	4	3	40	60	100	2
194CS1A5DA	DSE – I	NoSQL Database	4	0	0	3	25	75	100	4
194CS1A5DB		Software Testing								
194CS1A5DC		Mobile Computing								
194CS1A5TA	IT	Industrial Training	Grade A to C							
194CS1A5LA	LoP	Lab on Project	-	-	-	-	50	-	50	1
Part – IV										
192MT1A5AA	AECC - V	Research Methodology	2	0	0	3	-	50	50	2
		Total	**21**	**1**	**8**	**-**	**-**	**-**	**800**	**26**

Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
Sixth Semester										
Part – III										
194CS1A6CA	Core- XII	PHP & MySQL	4	0	0	3	25	75	100	4
194CS1A6CB	Core - XIII	Data Mining and Warehousing	3	1	0	3	25	75	100	3
194CS1A6CP	Core-Practical VIII	PHP & MySQL	0	0	4	3	40	60	100	2
194CS1A6CV	Core –XIV Project	Project Work	0	0	8	3	40	60	100	4
194CS1A6DA	DSE – II	Business Intelligence	4	0	0	3	25	75	100	4
194CS1A6DB		Semantic Web								
194CS1A6DC		Multimedia Systems								
194CS1A6DD	DSE – III	Middleware Technologies	4	0	0	3	25	75	100	4
194CS1A6DE		Mobile Ad-Hoc Networks								
194CS1A6DF		Social Network Data Analytics								
Part – IV										
193BC1A6AA	AECC - VI	Innovation, IPR and Entrepreneurship	2	0	0	3	-	50	50	2
Part-V										
194CS1A6XA		Extension Activity	-	-	-	-	50	-	50	1
		Total	**19**	**3**	**8**				**700**	**24**
		Grand total							**4200**	**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.	194CS1A5DA	NoSQL Database
2.	194CS1A5DB	Software Testing
3.	194CS1A5DC	Mobile Computing

Semester VI (Elective II)

List of Elective Courses

S. No.	Course Code	Name of the Course
1.	194CS1A6DA	Business Intelligence
2.	194CS1A6DB	Semantic Web
3.	194CS1A6DC	Multimedia Systems

Semester VI (Elective III)

List of Elective Courses

S. No.	Course Code	Name of the Course
1.	194CS1A6DD	Middleware Technologies
2.	194CS1A6DE	Mobile Ad-Hoc Networks
3.	194CS1A6DF	Social Network Data Analytics

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	194CS1A3GA	Office Automation

Semester IV (GE-II)

S. No.	Course Code	Course Name
1	194CS1A4GA	Web Designing

EXTRA CREDIT COURSES

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

S. No.	Course Code	Course Name
1	194CS1ASSA	Data Science and Big Data Analytics
2	194CS1ASSB	Enterprise Resource Planning

CERTIFICATE PROGRAMMES

The following are the programme offered to earn extra credits:

S. No.	Programme Code and Name	Course Code	Course Name
1	4CS5A Certificate course on Fundamentals of Cyber Security	4CS5A	Fundamentals of Cyber Security
2	4CS5B Certificate course on PC Hardware & Networking	4CS5B	PC Hardware & Networking

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: Refers to the starting and completion year of a programme of study. Eg. Batch of 2015–2018 refers to students belonging to a 3 year Degree programme admitted in 2015 and completing in 2018.

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

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

b) **Inter Disciplinary Course (IDC)**

A course chosen generally from a related discipline/subject, with an intention to seek exposure in the discipline relating to the core domain of the student.

c) **Discipline Specific Elective (DSE) Course**: DSE courses are the courses offered by the respective disciplinary/ interdisciplinary programme.

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

e) **Ability Enhancement Courses (AEC):** 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

Itis 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.

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

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

in the subsequent semester. He/she has to rejoin the semester in which the attendance is less than 55%.

- A candidate who has secured **less than 65%** of attendance in the final semester has to compensate his/her attendance shortage in a manner as decided by the concerned Head of the department after rejoining the same course.

4. EXAMINATIONS

- The end semester examinations shall normally be conducted after completing 90 working days for each semester.
- The maximum marks for each theory and practical course (including the project work and Viva-Voce examination in the final Semester) shall be 100 with the following breakup.

(i) Theory Courses

Continuous Internal Assessment (CIA) : **25** Marks

End Semester Exams (ESE) : **75** Marks

(ii) For Practical/ Courses

Continuous Internal Assessment (CIA) : **40** Marks

End Semester Exams (ESE) : **60** Marks

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

Continuous Internal Assessment for Practical Courses:

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

Project viva-voce / Industrial Training

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

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

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

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

Part – IV

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

6.1CONTINUOUS 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/ Assignment/ Class presentation
4	2	
6	3	
8	4	
10	5	
12	6	

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

c) Class Participation

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

d)PAPERS / REPORTS/ ASSIGNMENTS/ 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: _____ Branch: _____ Semester: _____

Course Code: _____ Course: _____

Max. Marks: Internal:_____ External: _____ Total: _____

S.No.	REG.NO	THEORY / PRACTICAL & LIBRARY CLASS PARTICIPATION (15) (Compulsory)				RUBRICS ASSESSMENT (SELECT ANY ONE)									Total Marks out of : 30	Total Marks out of : 16 /10 /08 /04
						PAPERS / REPORTS (15)			ASSIGNMENTS (15)			CLASS PRESENTATION (15)				
		Library	Integration of Knowledge	Interaction & Participation	Demonstration of Knowledge	Organization & Knowledge	Format & Spelling	Reference / Experiments	Demonstration of Knowledge	Format & Spelling	Reference	Content & Coherence	Creativity and Speaking Skills	Duration of Presentation		
		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	Distribution of Marks					
1	Minimum 10 experiments to be conducted/practical paper/semester	20	15	10	8	5	4
2	Tests : Two tests out of which one shall be during the mid semester and the other to be conducted as model test at the end of the semester.)	16	10	10	8	6	6
3	Observation Note Book	4	5	5	4	4	-
	TOTAL MARKS	**40**	**30**	**25**	**20**	**15**	**10**

7.FOR PROGRAMME COMPLETION

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

Student has to complete the following:

i) Part I,II,III,IV,V as mentioned in the scheme

ii) **Industrial/ Institutional training**

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

Based on the performance Grade will be awarded as follows:

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

8.9 Publications /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	T	P	Credit
194CT1A1CA	CORE:PROBLEM SOLVING USING C PROGRAMMING	Core	4	1	0	4

PREAMBLE

This course has been designed for students to learn and understand

- To enable the students to understand the program development techniques
- To understand the basic syntax of decision making and branching statements, arrays, strings, structures, union , pointers and functions
- To remember the concepts of file management.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the problem solving techniques and C programming basics	K1
CO2	Remember the concepts of C fundamentals , Types of operators and Input /Output functions	K1,K2
CO3	Understand the principles of decision making statement , array and strings	K1,K2,K3
CO4	Apply the knowledge of function ,structure and union	K3
CO5	Expose the concept of pointer and file management	K3

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

194CT1A1CA	CORE : PROBLEM SOLVING USING C PROGRAMMING	**SEMESTER I**

Total Credits: 4
Total Instructions Hours: 60 H

Syllabus

Unit I Program Development Style and Basic of 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 The C Declaration 12H

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 and Output.

Unit III Decision Making Statements ,Arrays and Strings 12H

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 Array – 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 ,Structures and Unions 12H

User-defined Functions: Needs for User-defined Functions - Elements of User-defined 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.

Unit V Pointers and File Management 14H

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
5. https://www.pdfdrive.com/programming-with-c-2nd-edition-by-byron-gottfried-e60345259.html

194CS1A1CP	CORE PRACTICAL : C PROGRAMMING	**SEMESTER I**

Total Credits: 2
Total Instructions Hours: 48 H

S.No	Contents
1	Write a C program to find the sum, average, standard deviation for a given set of numbers.
2	Write a C program to generate "n" prime numbers.
3	Write a C program to generate Fibonacci series.
4	Write a C program to print magic square of order n where n > 3 and n is odd.
5	Write a C program to sort the given set of numbers in ascending order
6	Write a C program to check whether the given string is a palindrome or not using pointers.
7	Write a C program to count the number of Vowels in the given sentence
8	Write a C program to find the factorial of a given number using recursive function
9	Write a C program to print the student's Mark sheet assuming roll no, name, and marks in 5 subjects in a structure. Create an array of structures and print the mark sheet in the university pattern
10	Write a function using pointers to add two matrices and to return the resultant matrix to the calling function.
11	Write a C program which receives two filenames as arguments and check whether the file contents are same or not. If same delete the second file.
12	Write a program which takes a file as command line argument and copy it to another file. At the end of the second file write the total i) no of chars ii) no. of words and iii) no. of lines

194CS1A1CQ	CORE PRACTICAL: LINUX	SEMESTER I

Total Credits: 2
Total Instructions Hours: 48 H

S.No	Contents
1	To open a new open office document and perform the following operations in it. i. Text Alignment ii. Change line spacing to 1.5 iii. Place a box to the entire text iv. Add the bullets and numbering v. Change type of font types and sizes vi. Insert the symbols.
2	To prepare an advertisement to a company with the following specifications i. Attractive Page Border. ii. Design the name of company using WordArt. iii. Use ClipArt Using of Open Office writer.
3	To design a Visiting Card for a company following specification i. Size of the Visiting Card 4″ X 3″. ii. Name of the company with a Word Art. iii. Using of Open Office writer.
4	To perform Table Creation, Formatting and Conversion using OpenOffice.org.
5	To perform mail merge and letter preparation using OpenOffice.org.
6	To draw a flow chart for a given problem in the OpenOffice.org.
7	To perform the formula editor in OpenOffice.org Calc.
8	To perform the insertion of objects, graphics and protecting the document in OpenOffice.org Calc.
9	To Draw a line, XY, bar and pie chart for a given user data in OpenOffice.org Calc to perform the sorting and import/export features.

10	Creating an Impress Presentation using wizard.
11	Create a presentation on Tourism of a place using different template, color schema and text formats
12	Create a presentation about your college and department using animations and sound effects. Add OLE object to your presentation.

Course Code	Course Name	Category	L	T	P	Credit
192MT1A1IB	IDC:DISCRETE MATHEMATICAL STRUCTURES	IDC	4	1	0	4

PREAMBLE

This course has been designed for students to learn and understand

- The sets and their operations.
- The different types of relations and their operations.
- The groups and graphs

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Discuss the types of sets and operations	K1
CO2	Describe the concepts of relations and digraphs	K1
CO3	Understand the concept of functions and Boolean algebra	K2
CO4	Apply the concept of graph theory in network problems	K3
CO5	Interpret the given language into the machine language	K3

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

192MT1A1IB	IDC:DISCRETE MATHEMATICAL STRUCTURES	**SEMESTER I**

Total Credits: 4
Total Instructions Hours: 60 H

Syllabus

Unit I Sets and Logic 12H

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

Unit II Relations and Digraphs 12H

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.

Unit III Order Relations and Structures 12H

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

Unit IV Languages and Finite State Machines 12H

Languages – Representation of special Grammars and Languages – Finite State Machines – Semi groups, Machines and Languages – Machine and regular Languages – Simplification of Machines.

Unit V Graph Theory, Semi groups and groups 12H

Graphs - Euler Paths and Circuits - Hamiltonian Paths and Circuits - Transport Network - Matching Problems - Coloring Graphs. Semi groups – Products and Quotients of Semi groups

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, New Delhi.

References

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

Course Code	Course Name	Category	L	T	P	Credit
191TL1A2TA	**தமிழ்த்தாள் - II**	Theory	4	1	-	3

PREAMBLE

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

S Strong M Medium L Low

191TL1A2TA	தமிழ்த்தாள் - II	SEMESTER II

Total Credits: 3
Total Instruction Hours: 60 h

Syllabus

Unit I அற இலக்கியம் **12 h**

1. திருக்குறள்

அ.அறன் வலியுறுத்தல் (அ. எண்: 04)

ஆ.நட்பாராய்தல் (அ. எண்: 80)

இ.சான்றாண்மை (அ. எண்: 99)

ஈ.குறிப்பறிதல் (அ. எண்: 110)

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

Unit II அற இலக்கியம் **10 h**

1. நாலடியார் - அறிவுடைமை

2.பழமொழி நானூறு - வீட்டு நெறி

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

Unit III உரைநடை **10 h**

1. பெற்றோர்ப் பேணல் - திரு.வி.க.

2. உள்ளம் குளிர்ந்தது - மு.வரதராசனார்

3. சங்கநெறிகள் - வ.சுப.மாணிக்கம்

Unit IV உரைநடை **13 h**

1.பெரியார் உணர்த்தும் சுயமரியாதையும் சமதர்மமும் - வே. ஆனைமுத்து

2. வீரவணக்கம் - கைலாசபதி

3.மொழியும்நிலமும் - எஸ். ராமகிருஷ்ணண்

Unit V இலக்கிய வரலாறு, இலக்கணம் மற்றும் பயிற்சிப்பகுதி **15 h**

அ.இலக்கிய வரலாறு

1. பதினெண் கீழ்க்கணக்கு நூல்கள்

2. தமிழ் உரைநடையின் தோற்றமும் வளர்ச்சியும்

ஆ. இலக்கணம்

1. வழு, வழுவமைதி, வழாநிலை

இ. பயிற்சிப்பகுதி

1. நூல் மதிப்பீடு மற்றும் திரைக்கதை திறனாய்வு

2. தன்விவரக் குறிப்பு எழுதுதல்

Text Books

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

References

1 பேராசிரியர் புலவர் இளவரசு, சோம. (ஜூலை2012). தமிழ் இலக்கிய வரலாறு. (எட்டாம் பதிப்பு) சென்னை: மணிவாசகர் பதிப்பகம்.

2 பேராசிரியர் முனைவர் பாக்கியமேரி (2013). இலக்கணம் இலக்கிய வரலாறு மொழித்திறன். (முதல் பதிப்பு) சென்னை பூவேந்தன் பதிப்பகம்.

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

Course Code	Course Name	Category	L	T	P	Credit
191TL1A2HA	HINDI-II	Theory	4	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

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

COURSE OUTCOMES

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

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

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

191TL1A2HA	HINDI-II	**SEMESTER II**

Total Credits: 3
Total Instruction Hours: 60 h

Syllabus

Unit I — 15 h

आधुनिकपद्य – शबरी(श्रीनरेशमेहता)

प्रकाशक: लोकभारतीप्रकाशन

पहलीमंजिल, दरबारीबिल्डिंग,

महात्मागाँधीमार्ग, इलाहाबाद**-211001**

Unit II — 15 h

उपन्यास: सेवासदन-प्रेमचन्द

प्रकाशक: सु मत्रप्रकाशन

204 लीलाअपार्ट्मेंट्स**, 15** हेस्टिंग्सरोड'

अशोकनगरइलाहाबाद**-211001**

Unit III — 15 h

अनुवादअभ्यास**-III (**केवलहिन्दीसेअंग्रेजीमें**)**

(पाठ**1 to 10)**

प्रकाशक: द क्षणभारतप्रचारसभाचेनैई**-17**

Unit IV — 15 h

पत्रलेखन: (औपचारिकयाअनौपचारिक)

Course Code	Course Name	Category	L	T	P	Credit
191TL1A2FA	FRENCH- II	Theory	4	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

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

COURSE OUTCOMES

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

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

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

191TL1A2FA	FRENCH- II	**SEMESTER II**

Total Credits: 3
Total Instruction Hours: 60 h

Syllabus

Unit I – Super! 13 h

•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? 13 h

Compétenc e Culturelle

- Le 20 siécle:

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 12 h

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

Le verbevenir:

Présent, impératif

En Suisse, auMaroc, aux Etats-Unis

Unit IV Maisoui! 12 h

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! 10 h

•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

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	T	P	Credit
191TL1A2MA	MALAYALAM-II PROSE: NON-FICTION	Theory	4	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

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

COURSE OUTCOMES

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

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

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

191TL1A2MA	MALAYALAM-II PROSE: NON-FICTION	**SEMESTER II**

Total Credits: 3
Total Instruction Hours: 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.

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

PREAMBLE

This course has been designed for students to learn and understand

- To experience the effect of dialogue, the brilliance of imagery and the magnificence of varied 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

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

S Strong M Medium L Low

191EL1A2EA	ENGLISH - II	SEMESTER II

Total Credits: 3
Total Instructions Hours: 60

Syllabus

Unit I Technical English 10

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 11

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 14

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 11

Resume Writing : Elements of Resume - difference between CV and Resume - Writing Job Application Art of Conversation: Small Talk- Body Language- Principles of Good Conversation Interview: Organizational role- Goals- Types- Interview Process

Group Discussion: Importance- Features- Strategies- Barriers

Unit V Soft Skills 14

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.

Course Code	Course Name	Category	L	T	P	Credit
194CA1A2CA	CORE-DATA STRUCTURES	CORE	4	1	0	4

PREAMBLE

This course has been designed for students to learn and understand

- To understand and analyze basic data structure algorithms
- To learn the fundamental of linked list, searching and sorting methods
- To analyze the traversal of trees and graph

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	To define the fundamental concepts of data structures	K1
CO2	To demonstrate and develop algorithm for linked list methods	K1,K2
CO3	To interpret and understand searching and sorting techniques	K1,K2,K3
CO4	To make use the concepts of Binary, Binary Search and AVL trees	K3
CO5	To construct algorithms for Graph and its Application	K3

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

194CA1A2CA	CORE -DATA STRUCTURES	**SEMESTER** II

Total Credits: 4
Total Instruction Hours: 60 h

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 Graph 14 h

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

Text Books

1 Vijayalakshmi Pai, G A (2008). Data Structures and Algorithms. (1st Edn.) New Delhi: Tata McGraw Hill.

References

1 Varsha Patil, H. (2012). Data Structures Using C++. (1st Edn.) Noida: Oxford Higher Education.

2 Ellis Horowitz, Sartaj Shani. (2010). Data and File Structures. (2nd Edn.) New Delhi: Galgotia Publication.

3 Horowitz, Shani, Anderson - Freed. (2008). Fundamentals of Data Structures in C. (2nd Edn.) Noida: Universities Press.

4 Malik, D.S. (2003). Data Structures Using C++. (1st Edn.) Noida:Cengage learning.

Course Code	Course Name	Category	L	T	P	Credit
194CS1A2CB	CORE-C++ PROGRAMMING	CORE	4	1	0	4

PREAMBLE

This course has been designed for students to learn and understand

- To understand the problem logic and apply techniques to solve it
- To learn the concepts of object oriented programming
- To be able to write C++ programs in an efficient manner

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	To spell the key concepts of OOPs, Input/Output and control structures	K1
CO2	To demonstrate C++ programs with functions, classes and objects	K2
CO3	To apply Operator Overloading & Inheritance technique for various problem solving approach	K3
CO4	To utilize C++ Strings, Pointers & Virtual functions	K3
CO5	To identify various File operations and Exception Handling mechanism	K3

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

194CS1A2CB	CORE-C++ PROGRAMMING	**SEMESTER** II

Total Credits: 4
Total Instruction Hours: 60 h

Syllabus

Unit I Principles of Object-Oriented Programming and C++ 10 h

Object-Oriented Programming Paradigm - Basic Concepts of Object Oriented Programming - Benefits of OOP- Applications of OOP. Beginning with C++: Definition of C++ - Applications of C++ - Structure of C++ Program. Tokens, Expressions and Control Structures: Operators in C++ - Scope Resolution Operator - Member dereferencing Operators - Memory Management Operators - Manipulators - Typecast Operators - Control Structures.

Unit II Functions Classes and Constructors 14 h

Introduction - The Main Function - Function Prototyping - Call by Reference - Return by Reference - Inline Functions - Function Overloading - Friend and Virtual Functions. Specifying a Class - Defining Member Functions - Memory allocation for Objects - Static Data Members – Static Member Functions – Array of Objects- Objects as Function Arguments- Friendly Functions- Returning Objects. Constructors – Parameterized Constructors- Constructors with Default Arguments- Copy Constructor-Destructors

Unit III Operator Overloading and Inheritance 12 h

Introduction - Defining Operator Overloading- Overloading unary, binary operators and binary operators using Friends – Rules for Overloading Operators- Type conversions. Inheritance: Introduction - Single, Multilevel, Multiple, Hierarchical, Hybrid inheritance – Virtual Base Classes – Abstract Classes

Unit IV Strings and Pointers 12 h

Strings: Introduction - Creating String Objects - Manipulating String Objects - Relational Operations - String Characteristics - Accessing Characters in Strings - Comparing and Swapping. Pointers: Introduction - Pointer to Objects – this pointer – Polymorphism - Pointers to derived classes - Virtual Functions - Pure Virtual Functions

Unit V Files and Exception Handling 12 h

Files: Introduction - Classes for File Stream Operations - Opening and Closing a File - Detecting End-of-File - More about Open(): File Modes - File Pointers and their Manipulations - Sequential Input and Output Operations - Updating a File: Random Access - Command-Line Arguments. Exception Handling: Introduction - Basics of Exception Handling - Exception Handling Mechanism - Throwing Mechanism - Catching Mechanism - Rethrowing an Exception.

Text Books

1 Balagurusamy, E (2018). Object-Oriented Programming with C++. (7th Edn.) New Delhi: Tata Mc-Graw Hill Publication.

References

1 Behrouz A. Forouzan Richard F.Gilberg. (2019). C++ Programming: An Object Oriented Approach. (1 Edn.) New Delhi: Tata Mc-Graw Hill Publication.

2 Herbert Schildt. (2017). C++: The Complete Reference. (4th Edn.) New Delhi: TataMcGrawHill.

3 Ashok Kamthane, N. (2013). Object-Oriented Programming with ANSI and TURBO C++. (Kindle Edn.) New Delhi: Pearson Education.

4 Bjarne Stroustrup. (2013). The C++ Programming Language. (4th Edn.) New Delhi: Pearson Education.

194CS1A2CP	CORE PRACTICAL-Data Structures Using C++	**SEMESTER II**

Total Credits: 2
Total Instructions Hours: 48h

S.No	Contents
1	Write a C++ Program to find the perfect number of a positive number using for loop
2	Write a C++ program to implement Stack using array
3	Write a C++ Program using constructors, destructors and inline member functions to read an integer number and find the sum of all the digits until it reduces to a single digit
4	Write a C++ Program to implement linked list
5	Write a C++ Program to create class, which consists of Employee details like E_Number, E_Name, Department, Basic Salary and Grade. Write a member function to get and display them. Derive a class Pay from the above class and write a member function to calculate DA, HRA and PF depending on the grade using Multiple Inheritance
6	Write a C++ Program to implement binary search
7	Write a C++ Program to create a class String. Write a Member Function to initialize, get and display strings. Use Operator Overloading to concatenate and compare two strings
8	Write a C++ program to perform in order traversal of a tree
9	Write a C++ program to throw exception when entered marks are less than 0 or greater than 100
10	Write a C++ program to implement graph using adjacency matrix

Note: Any 8 experiments are mandatory

Course Code	Course Name	Category	L	T	P	Credit
192PY1A2IB	IDC -DIGITAL ELECTRONICS	IDC	4	0	0	4

PREAMBLE

This course has been designed for students to learn and understand

- To learn the concepts of number system and circuits
- To understand the ideas about logic families and memory
- To enhance 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	To show and enumerate about the number system.	K1
CO2	To plan and simplify the expressions of combinational Logic Circuits	K3
CO3	To infer and outline the concept of sequential circuits	K2
CO4	To spell and understand the different types of logic families and memory	K1
CO5	To tell and understand the concept of microprocessors and microcontrollers	K1

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

192PY1A2IB	IDC - DIGITAL ELECTRONICS	**SEMESTER** II

Total Credits: 4
Total Instruction Hours: 48 h

Syllabus

Unit I Number System 10 h

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 9 h

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 9 h

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 10 h

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 10 h

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

Text Books

1. Puri, V.K. (2017). Digital Electronics Circuits and Systems. (1st Edn.) New Delhi: TMH Unit I,II,III, IV - up to logic families and V.
2. Ramesh Gaonkar, S. (2010). Microprocessor Architecture, Programming, and Applications with the 8085. (5thEdn.) New Delhi: PIP Unit IV - Memory.

References

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

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

PREAMBLE

This course has been designed for students to learn and understand

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

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the concept of human values, personality traits and character formation.	K2
CO2	Acquire the knowledge through value education towards national and global development.	K1
CO3	Introduce the basic concepts of conflict, emotions and adolescent emotions.	K1
CO4	Illustrate the techniques in therapeutic measures like yoga and meditation.	K2
CO5	Learn the concepts of human rights, rights for women and children and domestic violence.	K3

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong **M Medium** **L Low**

196BM1A2AA	AECC : HUMAN RIGHTS	**SEMESTER II**

Total Credits: 2
Total Instruction Hours: 24 h

Syllabus

Unit I Introduction to human values 05 h

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

Unit II Value education and Social values 05 h

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

Unit III Global Development on Ethics and Values 04 h

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

Unit IV Yoga and Meditation 05 h

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

Unit V Human Rights and Rights of Women and Children 05 h

Human Rights - Concept of Human Rights – Indian and International Perspectives Evolution of Human Rights - Definitions under Indian and International

documents - Broad classification of Human Rights and Relevant Constitutional Provisions - Right to Life - Liberty and Dignity - Right to Equality - Right against Exploitation - Cultural and Educational Rights - Economic Rights - Political Rights - Social Rights - Human Rights of Women and Children - Social Practice and Constitutional Safeguards - Female Foeticide and Infanticide - Physical assault and harassment - Domestic violence - Conditions of Working Women - Institutions for Implementation - Human Rights Commission - Judiciary - Violations and 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

18/4/19

BoS Chairman/HoD
Department of Computer Science
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Coimbatore – 641 048

Academic Council
Dr.N.G.P. Arts and Science College
Dr.V.Rajendran
CHAIRMAN
20/4/19

Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
Third Semester										
194IT1A3CA	Core - IV	Java Programming	4	-	-	3	25	75	100	4
194CT1A3CA	Core -V	Operating Systems	4	1	-	3	25	75	100	4
194CS1A3CP	Core Practical- IV	Java Programming	-	-	4	3	40	60	100	2
192MT1A3IC	IDC - III	Numerical Methods and Statistics	4	1	-	3	25	75	100	4
194CS1A3SA	SEC-I	Web Designing	4	-	-	3	25	75	100	4
194CS1A3SP	SEC Practical -I	Web Designing	0	-	4	3	40	60	100	2
	GE – I		2	-	-	2	-	50	50	2
	LoP	Lab on Project	-	-	-	-	-	-	-	-
Part - IV										
191TL1A3AA	AECC - III	Basic Tamil	2	-	-	3	-	50	50	2
191TL1A3AB		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	194CS1ASSA	Data Science and Big Data Analytics
2	194CS1ASSB	Enterprise Resource Planning

14/5/20

BoS Chairman/HoD
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Academic Council
Dr.V. Rajendran
CHAIRMAN
Dr. N.G.P. Arts and Science College

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

PREAMBLE

This course has been designed for students to learn and understand

- gain knowledge of object-oriented paradigm in the Java programming language.
- emphasize on event-driven programming methods.
- Highlight 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.	K3
CO4	Demonstrate the concept of JDBC and RMI	K3
CO5	Building programs to develop rich internet applications using JavaFX	K3

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

194IT1A3CA	JAVA PROGRAMMING	SEMESTER III

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Object Oriented Concepts 9 h

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 10 h

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 10 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 10 h

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 9 h

JavaFX: Introduction – History - Environment - Architecture – Application - Shapes – Text – Effects – Transformation- Animations – Colors – Images – User Interface

Controls – Charts – CSS – Layout Panes - Media with JavaFx – Event handling with JavaFx.

Text Books

1. Instructional Software Research and Development (ISRD) Group, 2007 "Introduction to Object Oriented Programming through Java", Tata McGraw-Hill Publishing Company Limited, New Delhi.
2. Kishori Sharan, 2015, "Learn JavaFx – Building User Experiences and Interfaces with Java 8", Apress.

References

1. E.Balaguruswamy, 2010, " Programming with Java A Primer", 2nd Edition, Tata McGraw Hill Publications.
2. Schildt, 2010, "The Complete Reference Java", 8th Edition, Tata McGraw Hill Publications.
3. Xavier.C, 2010, "Programming with JAVA 2", SciTech Publication, and Chennai.
4. Paul Deitel and Harvey Deitel, 2015, "Java How to Program, Deitel & Associates", 10th edition, Inc Publications.

Course Code	Course Name	Category	L	T	P	Credit
194CT1A3CA	OPERATING SYSTEM	CORE	4	1	-	4

PREAMBLE

This course has been designed for students to learn and understand

- Evolution of OS, its functions and process.
- The Process scheduling and Deadlock techniques.
- The 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	Ascertain facts on Storage management.	K3

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

194CT1A3CA	OPERATING SYSTEM	SEMESTER III

Total Credits: 4

Total Instruction Hours: 60 h

Syllabus

Unit I Introduction to Operating Systems 12 h

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] 12 h

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

Unit III Deadlocks 12 h

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

Unit IV Memory Management 14 h

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

Unit V Storage Management 10 h

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.

Text Books

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

References

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.

194CS1A3CP	JAVA PROGRAMMING	SEMESTER III

Total Credits: 2
Total Instructions Hours: 48 h

S.No	Contents
1	Compute mean, median, mode and standard deviation for the given set of numbers using Java code.
2	Create a Java program to implement classes, objects, methods and constructor to determine the area of circle, rectangle and square.
3	Use command line arguments to determine unique elements in the given list of numbers using Java.
4	Build a Java program that demonstrates the purpose of access modifiers to display university results.
5	Implement types of exception handling in Java.
6	Derive the concepts of threading by extending Thread Class in Java.
7	Illustrate user defined packages and perform string manipulation functions in Java.
8	Count the number of characters, words and lines in a text file using Java code.
9	Manipulate student database operations using JDBC-ODBC driver in Java.
10	Apply Remote Method Invocation concepts in Java.
11	Perform calculator functions in JavaFX platform.
12	Design an application that performs event handling with JavaFX.

Note: Any 10 experiments are mandatory.

Course Code	Course Name	Category	L	T	P	Credit
192MT1A3IC	NUMERICAL METHODS AND STATISTICS	IDC	4	1	-	4

PREAMBLE

This course has been designed for students to learn and understand

- Solve simultaneous linear algebraic equations
- Student knowledge in measures of central tendency and dispersion
- 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	Explain about linear algebraic equations	K2
CO2	Discuss the concept of numerical differentiation and numerical integration	K2
CO3	Use measures of central tendency and variation for statistical analysis	K3
CO4	Demonstrate relation between variables using correlation and regression analysis	K3
CO5	Analyze the concept of test of significance	K4

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

192MT1A3IC	NUMERICAL METHODS AND STATISTICS	SEMESTER III

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 IV Correlation and Regression 12 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

Unit V Test of Significance and Chi-Square Test 14 h

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 - 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 - Degrees of freedom - Chi square test of goodness of fit - Chi square as a test of independence

Note: Theory 20% and Problems 80%

Text Books

1. Kandasamy, P. Thilagavathy, K. and Gunavathi K., 2015, 'Numerical Methods', 15th Edn, S. Chand and Company Ltd, New Delhi.
2. Pillai R.S.N and Bagavathi, 2002, 'Statistical Methods', 14th Edn, S. Chand and Company Ltd, New Delhi

References

1. Gupta S.P, Gupta M.P, 2002, 'Business Staitistics' 17th Edn., Sultan Chand and Sons., New Delhi.
2. Beri.,G.C ,2010, ' Business Statistics' 3rd Edn.,McGraw Hill Education Pvt. Ltd, New Delhi
3. Venkataraman,M.K. 2004, 'Numerical Methods in Science and Engineering,4th Edn., National Publishing Company, Chennai
4. Veerarajan.T,Ramachandran.T, 2004 'Theory and Problems in Numerical Methods With Programs in C and C++', 10th Edition, Tata Mc- Graw Hill Publishing Company Limited, New Delhi

Course Code	Course Name	Category	L	T	P	Credit
194CS1A3SA	WEB DESIGNING	SEC	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- The basic principles of creating an effective web page.
- design and development skills in markup languages.
- enrich the responsive web designing skills for smart phones and tablets.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the basic structure of a web page and code editors.	K2
CO2	Identify the basic HTML tags	K1
CO3	Apply CSS in a web page.	K3
CO4	Demonstrate form validation using JavaScript	K3
CO5	Develop responsive web page using multimedia controls	K3

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

194CS1A3SA	WEB DESIGNING	SEMESTER III

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Introduction 9 h

Web Publishing: Thinking Like a Web Publisher - Web Browsers - Web Servers - Uniform Resource Locators. Getting Your Tools in Order: Anatomy of a Website - Setting Up Your Computer for Web Publishing - Using the Google Chrome Developer Tools - Wireframing- Web Hosting. Introducing HTML and CSS: Definition of HTML - HTML Attributes - Using the styleAttribute - History of HTML Standards - The Current and Evolving Standard: HTML5.

Unit II Creating Web Pages 10 h

Learning the Basics of HTML: Structuring Your HTML - The Title - Headings - Paragraphs - Comments. Organizing Information with Lists: An Overview - Numbered Lists - Unordered Lists - Definition Lists - Nesting Lists. Working with Links: Creating Links - Linking Local Pages Using Relative and Absolute Pathnames - Links to Other Documents on the Web - Linking to Specific Places Within Documents - Anatomy of a URL.

Unit III HTML and CSS 10 h

Formatting Text with HTML and CSS: Character-Level Elements - Character Formatting Using CSS - Preformatted Text - Horizontal Rules - Line Break - Addresses - Quotations - Special Characters - Fonts and Font Sizes. Using CSS to Style a Site: Including Style Sheets in a Page - Selectors - Editing Styles with Developer Tools - Using Color - Links - The Box Model - The <body> Tag. Using Images on Your Web Pages - Building Tables.

Unit IV Building Forms using JavaScript 10 h

Designing Forms: Understanding Form and Function - Using the <form> Tag - Using the <label> Tag - Creating Form Controls with the <input> Tag - Using Other Form Controls - Grouping Controls with fieldset and legend - Applying Cascading Style Sheet Properties to Form Elements. Introducing JavaScript: Need - The <script> Tag. Using JavaScript in Your Pages: Validating Forms with JavaScript - Hiding and Showing Content. Working with Frames and Linked Windows: Frames - Linked Windows - Inline Frames.

Unit V Doing More Functionalities 9 h

Integrating Multimedia: Video and Sound: Embedding Video the Simple Way - Hosting Your Own Video - Embedding Video Using <video> - Embedding Flash

Using the <object> Tag - The <embed> Tag - Embedding Flash Movies Using SWFObject - Embedding Audio in Your Pages. Using Responsive Web Design (RWD): Definition of RWD - Mobile Devices Should Come First - Planning a Responsive Website - Writing Media Queries - Understanding the Mechanics of RWD. Case Study: Bootstrap.

Text Books

1. Laura Lemay, Rafe Coburn, Jennifer Kyrnin, 2016, "HTML, CSS & JavaScript" Web Publishing, 7thEdition, Pearson Education.

References

1. H. M. Deitel, P. J. Deitel, A. B. Goldberg, 2013, "Internet & World Wide Web How to Program", 4th Edition, Pearson Education.
2. Thomas A. Powell, 2007, "The Complete Reference HTML & XHTML", 4th Edition, Tata McGraw-Hill..
3. Ramesh Bangia, 2006, "Web Technology", 1st Edition, Firewall Media Publications.

194CS1A3SP	WEB DESIGNING	SEMESTER III

Total Credits: 2
Total Instructions Hours: 48 h

S.No	Contents
1	Create a Home page for a Banking sector using standard HTML tags.
2	Demonstrate the Home page of a Banking sector by applying various attributes and elements of HTML.
3	Design a web page for Grocery Store use ordered list, unordered lists and navigation to showcase the products available in the store.
4	Apply advanced HTML tags, CSS, image, image map to the Grocery store website.
5	Create a table to display the latest computer peripherals with price quotes and its related information available in the market.
6	Design a dynamic website for a mobile company using HTML formatting tags.
7	Construct a user registration form using Form controls in HTML.
8	Validate the user registration form with JavaScript functions for one or more controls.
9	Build a web page with frames and hyperlinks for your Institution.
10	Construct a dynamic website for online tutorials embed audio and video within the web page.
11	Resume building using appropriate formatting elements.
12	Develop a web site for Educational Institution using CSS properties.

Note: Any 10 experiments are mandatory

194CS1A3GA	GENERIC ELECTIVE : OFFICE AUTOMATION	SEMESTER III

Total Credits: 2

Total Instruction Hours: 24 h

Syllabus

Unit I Using Windows 5 h

History of Windows - Starting Windows - Using the Mouse – Definition of Window - Using the Start Menu - Shutting Down, Restarting and Logging Off Windows - Customizing the Desktop - Changing Screen Resolution - Control Panel - Making More Use of the Taskbar.

Unit II Word Processing with Microsoft Word 5 h

Word Processing - Microsoft Word - Creating a Document - Saving a Document in a Disk File - Print and Print Preview a Document – Opening a Document - Cursor Movement - Editing a Document - Formatting Text - Using Bullets and Numbering in Paragraphs - Formatting Paragraphs - Using Tabs - Creating Tables.

Unit III Microsoft Excel 5 h

Definition of Electronic Worksheet or Spreadsheet - Definition of Excel - Saving a Workbook - Closing a Workbook - Opening a Existing Workbook file - Creating a New Workbook - Aligning Data in Cells - Formatting Data in Cells - Formatting Numbers - Editing Data in Cell - Excel functions – Inserting / Deleting Rows, Columns and Cells.

Unit IV Microsoft Access 5 h

Starting Access - Creating a Database – Definition of Table - Creating a New Table in a Database - Using Lookup Wizard - Opening an Existing Database - Opening a Table - Definition of Query - Finding and Replacing Data in a Table - Database Security - Backup a Database.

Unit V Microsoft PowerPoint 4 h

Starting PowerPoint - Creating a New Presentation - Adding Slides to a Presentation - Saving a Presentation - Closing a Presentation - Opening an Existing Presentation - Editing and Formatting Slides - Using Tables in Slides - Inserting Video and Audio - PowerPoint Views – Slideshow. Case Study: Google Docs.

Text Books

1 Ravi Kant Taxli, 2010, "Computer Course Windows 7 and Office", 1st Edition, Tata McGraw Hill.

References

1 Ian Lamont 2018, "Google Drive and Docs in 30 Minutes: The Unofficial Guide to Google Drive, Docs, Sheets & Slides", 2nd Edition, I30 Media Corporation.

2 Laura Story, 2009, "Microsoft Office 2007 Fundamentals", 1st Edition, Cengage Learning.

3 Ron Mansfield, 2008, "Working in Ms Office", Tata McGraw Hill.

194CS1ASSA	SELF STUDY: DATA SCIENCE AND BIGDATA ANALYTICS	SEMESTER III

Total Credit: 1

Syllabus

Unit I Data Science and Big Data

Data Science in a Big Data World: Benefits and uses of Data Science and Big Data - Facets of Data - The Data Science Process - The Big Data Ecosystem and Data Science.

Unit II The Data Science Process]

POverview of the Data Science Process: Defining Research Goals and Creating a Project Charter - Retrieving Data - Cleansing, Integrating, and Transforming Data - Exploratory Data Analysis

Unit III Big Data Sources and Applications

Big Data Sources: People-to-People – People-to-Machine Communications - Machine-to-Machine (M2M) Communications: RFID Tags - Sensors. Big Data Applications: Monitoring and Tracking - Analysis and Insight - New Product Development - Standard Big Data Architecture - Examples.

Unit IV Distributed Computing and Parallel Processing

Distributed Computing Using Hadoop: Hadoop Framework – HDFS Design Goals – Master-Slave Architecture – Block System – Ensuring Data Integrity – Installing HDFS - Sequence Files - YARN. Parallel Processing with Map Reduce: Overview - Sample MapReduce Application: Wordcount - MapReduce Programming.

Unit V Parallel Processing and Ingesting Data

Parallel Processing with Map Reduce: MapReduce Jobs Execution – Hadoop Streaming - Hive – Pig Language. New Ingesting Data: Messaging Systems - Data Ingest Systems - Apache Kafka - Use Cases - Kafka Architecture - Apache ZooKeeper. Case Study: Web Log Analyzer Application.

Text Books

1. Davy Cielen, Arno D.B. Meysman, Mohamed Ali, 2016, "Introducing Data Science: Big Data, Machine Learning, and more, using Python tools", 1st Edition, Manning Publications Co. [Unit 1 & 2]
2. Dr. Anil Maheshwari, 2017, "Big Data", 2nd Edition, TATA McGraw Hill Publications. [Unit 3, 4 & 5]

References

1. Jain V.K., 2017, "Big Data and Hadoop", Khanna Book Publishing Co.
2. Paul C. Zikopolus, Chris Eaton, Dirk deRoos, Thomas Deutsch, George Lapis, 2012, "Understanding Big Data: Analytics For Enterprise Class Hadoop and Streaming Data", TATA McGraw Hill Publications.

194CS1ASSB	SELF STUDY: ENTERPRISE RESOURCE PLANNING	SEMESTER III

Total Credit: 1

Syllabus

Unit I Enterprise Resource Planning (ERP)

Introduction: Need for ERP Systems - Evolution of ERP - Definition of ERP System - Information Systems Perspective of ERP - Role of ERP in Business - Challenges of ERP - ERP in Indian Companies. Advanced ERP: Supply Chain Management (SCM) System - Customer Relationship Management (CRM) System.

Unit II E-Commerce and ERP Architecture]

E-Commerce: A Concept - e-Commerce Sales Life Cycle (ECSLC) Model - E-Commerce Technology Infrastructure - ERP and e-Commerce Applications - Rise of M-commerce - ERP and e-Commerce Challenges. ERP Architecture: Need - Technical Aspects - Evolution of ERP Architecture - ERP Platforms

Unit III ERP Analysis and Business Case

ERP Need Analysis: Strategic Plan - Strategic Analysis - Establishing Need for ERP Systems. Business Case for ERP: Need for Business Case for ERP - Business Rationale for ERP Implementation - Justifying the ERP Investments - Benefits of ERP Systems - Feasibility Study.

Unit IV System Development Life Cycle (SDLC), ERP and Business Process Reengineering (BPR)

SDLC: Knowledge of Software Development - SDLC - System Development Models. ERP Life Cycle: ERP Implementation Life Cycle - SDLC and ERP Life Cycle. ERP and BPR: Definition - BPR Life Cycle - BPR Tools and Technologies - Success and Failure Factors in implementing BPR. Case Study: Change Management at GSA University.

Unit V ERP Technologies

Related Technologies and ERP: On-line Analytical Processing (OLAP) - Data Mining - Business Intelligence - Integration of Related Technologies with ERP. Emerging Trends and Future of ERP: Emerging Technologies and ERP - Models for ERP Deployment - ERP II or Enterprise System - Future of ERP.

Text Books

1 Goyal D.P., 2011, " Enterprise Resource Planning: A Managerial Perspective", 1st Edition, Tata McGraw Hill

References

1 Alexis Leon, 2014, "Enterprise Resource Planning", 3rd Edition, Tata McGraw Hill.

2 Vinod Kumar Garg and Venkitakrishnan N.K., 2011, "Enterprise Resource Planning– Concepts and Practice ", 2nd Edition, PHI Learning Pvt. Ltd.

191TL1A3AA	பகுதி – 4 : அடிப்படைத்தமிழ்தாள் : 1(Basic Tamil)	SEMESTER III

Total Credits: 2

Total Instruction Hours: 24 h

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

அலகு : 1 தமிழ் மொழியின் அடிப்படைக் கூறுகள் 12 h

அ) எழுத்துகள் அறிமுகம் :

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

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

அலகு : 2 குறிப்பு எழுதுதல் 12 h

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

வினாத்தாள் அமைப்பு முறை - மொத்த மதிப்பெண்கள் - 100

பகுதி –அ

சரியான விடையைத் தேர்வு செய்தல் 10x2=20

பகுதி –ஆ

சரியா? தவறா? தேர்ந்தெடுத்து எழுதுக . 10x2=20

பகுதி-இ

ஒரு பக்க அளவில் விடையளிக்க 03x20=60

குறிப்பு:

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

Text Books

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

References

1 ஒன்றாம் வகுப்பு பாடநூல் - தமிழ்நாடு அரசு பாடநூல் கழகம்

2 வலைதள முகவரி : http://tamilvu.org

191TL1A3AB	பகுதி – 4 : சிறப்புத் தமிழ் தாள் : 1 **(Advanced Tamil)**	**SEMESTER - III**

Total Credits: 2

Total Instruction Hours: 24 h

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

அலகு – 1 மரபுக் கவிதைகள் 05 h

அ) பாரதியார் கவிதைகள்

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

ஆ) பாரதிதாசன் கவிதைகள்

- இன்பத்தமிழ்
- நீங்களே சொல்லுங்கள்
- வாளினை எடடா!

இ) தாராபாரதி கவிதைகள்

- வேலைகளல்ல வேள்விகள்

அலகு – 2 புதுக்கவிதைகள் 05 h

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

அலகு – 3 இலக்கணம் 04 h

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

அலகு – 4 கடிதங்கள் எழுதுதல் 05 h

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

அலகு – 5 பாடம் தழுவிய வரலாறு 05 h

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

வினாத்தாள் அமைப்பு முறை - மொத்த மதிப்பெண்கள் - 100

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

குறிப்பு:

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

Text Books

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

References

1 புலவர் சோம. இளவரசு - 2014. இலக்கிய வரலாறு, மணிவாசகர் பதிப்பகம், சென்னை – 108

2 வலைதள முகவரி : http://tamilvu.org

195CR1A3AA	WOMEN'S RIGHTS	SEMESTER III

Total Credits: 2

Total Instruction Hours: 24h

Syllabus

Unit I Rights to Infant & Child 4 h

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

Unit II Rights to women 5 h

Matrimonial protection-Protection against dowry-Protection to pregnancy-Sexual offences-Law relating to work Place- Directive principles of Constitution (Article 39 a, d, e & Article 42, 43 & 46) - Trafficking of women

Unit III Laws for Senior Citizen women 5 h

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

Unit IV Civil and Political Rights of Women 5 h

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

Text Books

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

References

1 Women's Human Rights in India(2019)-Christian Foster and Jaya Sagade- Routledge India

2 Justice for Women: Concerns and Expressions (2008)-Anand AS –Universal Law Publishing Co.

14/5/20

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

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

Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
Fourth Semester										
Part – III										
194CS1A4CA	Core -VI	Agile Methodology	4	1	0	3	25	75	100	4
194IT1A4CA	Core -VII	Relational Database Management System	4	1	0	3	25	75	100	4
194CS1A4CP	Core Practical - V	Relational Database Management System	0	0	4	3	40	60	100	2
195CI1A4IB	IDC - IV	Fundamentals of Accounting	4	0	0	3	25	75	100	4
194CS1A4SA	SEC – II	Python Programming	4	0	0	3	25	75	100	4
194CS1A4SP	SEC Practical -II	Python Programming	0	0	4	3	40	60	100	2
	GE – II		2	0	0	2	-	50	50	2
	LoP	Lab on Project	-	-	-	-	-	-	-	-
Part - IV										
191TL1A4AA	AECC - IV	Basic Tamil	2	0	0	3	-	50	50	2
191TL1A4AB		Advanced Tamil								
192PY1A4AA		General Awareness								
		Total	**20**	**2**	**8**	**-**	**-**	**-**	**700**	**24**

26/11/2020

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

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

Dr.NGPASC
COIMBATORE | INDIA

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

Course Code	Course Name	Category	L	T	P	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	Understand the basic techniques of Agile Methodology	K2
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.	K3

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

194CS1A4CA	AGILE METHODOLOGY	SEMESTER IV

Total Credits: 4

Total Instruction Hours: 60 h

Syllabus

Unit I Introduction to Project Management 12 h

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 12 h

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 12 h

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 -

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.

References

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	T	P	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	M	S	S	S	S
CO3	S	S	S	S	M
CO4	S	M	S	S	M
CO5	S	S	S	S	S

S Strong M Medium L Low

194IT1A4CA	RELATIONAL DATABASE MANAGEMENT SYSTEM	SEMESTER IV

Total Credits: 4

Total Instruction Hours: 60 h

Syllabus

Unit I Database Concepts 12 h

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

Unit II Oracle9i 12 h

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.

Unit III Data Management and Retrieval 12 h

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 12 h

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

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

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

Text Books

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

References

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,

194CS1A4CP	CORE PRACTICAL: RELATIONAL DATABASE MANAGEMENT SYSTEM	SEMESTER IV

Total Credits: 2
Total Instructions Hours: 48 h

S.No	List of Experiments
1	Create a table for Employee details with Employee Number as primary key and following fields: Name, Designation, Gender, Age, Date of Joining and Salary. Insert at least ten rows and perform various queries using any one Comparison, Logical and Set operators.
2	Create tables for library management system which demonstrate the use of primary key and foreign key. Master table should have the following fields: Accno, Title, Author and Rate. Transaction table should have the following fields: User id, Accno, Date of Issue and Date of Return. Create a Report (Select verb) with fields Accno, Title, Date of Issue for the given Date of Return with column formats.
3	Create a table to store Student Information and perform the following queries. a. Display the table information. b. Alter the table to add a new column and modify the existing column. c. Rename, Truncate and Drop the table.
4	Create the following table (PK - Primary Key, FK – Foreign Key) cat_head, route_head, place_head, route_detail, ticket_detail, ticket_head with the mapping given below: cat_headroute_head (cat_code PK) (cat_code FK) route_headroute_detail (route_id PK) (route_id FK) ticket head ticket detail (tick_no PK) (tick_no FK) place_head route_detail (place_id PK) (place_id FK).
5	(a) Alter the table ticket header to add a check constraint on ticket_no to accept values between 1 and 500. (b) Alter table route header to add a column with data type as long. (a) Insert values to above tables. (b) Display only those routes that originate in madras and terminate at Cochin. (c) Display only distinct category code from the table route_header in descending manner. (d) Update the table route_header to set the distance between madras and coimbatore as 500.

6	Using the employee database perform grouping and sorting operations.
7	Write a PL/SQL to update the rate field by 20% more than the current rate in inventory table which has the following fields: ProNo, ProName and Rate. After updating the table a new field (Alter) called for Number of item and place for values for the new field without using PL/SQL block.
8	Write a PL/SQL to raise the following Exception in Bank Account Management table when deposit amount is zero.
9	Write a PL/SQL to split the student table into two tables based on result (One table for "Pass" and another for "Fail"). Use cursor for handling records of student table. Assume necessary fields and create a student details table.
10	Write a Pl/SQL program to implement packages.
11	Create a database trigger to implement on master and transaction tables which are based on inventory management system for checking data validity. Assume the necessary fields for both tables.
12	Develop a simple database for Student Database Management System.

Note: Any 10 Experiments are Mandatory

Course Code	Course Name	Category	L	T	P	Credit
195CI1A4IB	FUNDAMENTALS OF ACCOUNTING	IDC-IV	4			4

PREAMBLE

This course has been designed for students to learn and understand

- To analyze business transactions from an accounting viewpoint
- To recognize, record, and classify new accounting data
- To understand the rules of accounting used to enter the business transactions in a systematic manner to maintain books of accounts

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Know the concepts, conventions and rules of accounting to pass journal entries and prepare ledger accounts and cash books	K1
CO2	Obtain knowledge to prepare the final accounts of a company	K2
CO3	Classify and apply appropriate methods of depreciation	K2
CO4	Understand about single entry system of book keeping	K2
CO5	Acquire knowledge about branch accounts	K2

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

195CI1A4IB	FUNDAMENTALS OF ACCOUNTING	SEMESTER IV

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Fundamentals of Book Keeping 12 h

Definition, objectives, methods of accounting, Branches of accounting, Types of Accounts and Accounting rules –Accounting Concepts and conventions–Journal–Ledger–Subsidiary books: Purchases Book, Sales Book, Purchases Returns, Sales Return book, Cash Book Single Column, Double Column and Triple Column – Trial balance.

Unit II Final Accounts 8 h

Final accounts of a sole trader with adjustment: trading account, profit and loss account and Balance sheet with adjustment.

Unit III Depreciation 8 h

Meaning – Causes – objectives of depreciation – Factors affecting depreciation – Accounting Treatment – Methods of depreciation.– Straight line method – Diminishing Balance Method

Unit IV Single Entry System 10 h

Single Entry System – Meaning and Features –Limitations- Advantages- Statement of Affairs Method.

Unit V Branch Accounts 10 h

Introduction – Meaning – Objectives – Types of Branches - Dependent Branches – Features – Supply of Goods at Cost Price - Invoice Price – Branch Account in the books of Head Office -Debtors System Only (Excluding foreign branches).

Note: Distribution of Marks: 80% Problems and 20%Theory

Text Books

1. Jain,S.P., and Narang,K. 2014. Financial Accounting. [Fifth Edition]. Kalyani Publishers, Ludhiana.
2. Nagarajan,K.L., Vinayaka,N., and Mani P.L. 2013. Principles of Accountancy [First Edition]. Sultan Chand & Company Ltd, New Delhi.

References

1. Reddy,T.S. and Murthy,A. 2014. Financial Accounting [Sixth Edition]. Margham Publications, Chennai.
2. Grewal T.S. 2009. Introduction to Accountancy [Fifth Edition]. Sultan Chand & Company Ltd , New Delhi.
3. Arulandam. M.A and Ramaan.K.S, 2012. Advanced Accountancy. [Revised Edition]. Himalaya Publishing House, Mumbai.
4. Pillai. R.S.N and Bagavathi, Uma.S. 2012. Fundamentals of Advanced Accounting (Volume I). [Third Revised Edition]. Sultan Chand & Company Ltd, New Delhi.

Course Code	Course Name	Category	L	T	P	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	K2
CO4	Understanding the machine learning ability of Python based components	K3
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	M	S
CO3	M	M	M	S	L
CO4	M	M	M	M	S
CO5	M	L	S	S	M

S Strong M Medium L Low

194CS1A4SA	PYTHON PROGRAMMING	SEMESTER IV

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Introduction to Python 8 h

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 10 h

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 10 h

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

Unit V Pandas 10 h

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

Textual Files - Reading Data in CSV or Text Files - Reading and Writing HTML Files

Text Books

1 E. Balagurusamy, 2016, "Introduction to Computing and Problem Solving Using Python", McGrawHill publication. UNIT 1, 2 and 3

2 Fabio Nelli , 2015, "Python Data Analytics" , Apress, 1st Edition. UNIT 4 and 5

References

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

194CS1A4SP	CORE PRACTICAL: PYTHON PROGRAMMING	SEMESTER IV

Total Credits: 2
Total Instructions Hours: 48 h

S.No	List of Experiments
1	Create a python program to implement the different operators.
2	Write a python program to implement branching and looping constructs.
3	Create a python program to find the perfect number
4	Create a python program to implement the user defined functions.
5	Python program to implement String Operations and functions.
6	Create a python program to implement various operations on tuple.
7	Implement a python program for List operations.
8	Create a python program to print employee details using dictionaries.
9	Write a python script to perform basic operations using numpy
10	Write a python program to implement shape and array manipulation in numpy.
11	Implement a python program to implement the different operations on dataframes.
12	Write a python program to read a CSV file and perform read and write operations.

Note: Any 10 experiments mandatory

194CS1A4GA	GENERIC ELECTIVE: WEB DESIGNING	SEMESTER IV

Total Credits: 2

Total Instruction Hours: 24 h

Syllabus

Unit I Web Design Principles 4 h

Basic principles involved in developing a web site- Planning process-Five Golden rules of web designing-Designing navigation bar-Page design - Home Page Layout –Design Concept.

Unit II Basics in Web Design 5 h

Brief History of Internet - What is World Wide Web - Why create a web site - Web Standards - Audience requirement. Introduction to HTML: What is HTML - HTML Documents - Basic structure of an HTML document - Creating an HTML document - Mark up Tags - Heading-Paragraphs- Line Breaks- HTML Tags.

Unit III Elements of HTML 5 h

Introduction to elements of HTML - Text – Lists- Tables - Frames – Hyperlinks - Images -Forms and controls.

Unit IV Introduction to Cascading Style Sheets 5 h

Concept of CSS - Creating Style Sheet-CSS Properties - CSS Styling - Working with block elements and objects - Working with Lists and Tables - CSS Id and Class - Box Model.

Unit V Introduction to Web Publishing or Hosting 5 h

Creating the Web Site - Saving the site - Working on the web site - Creating web site structure - Creating Titles for web pages - Themes-Publishing web sites.

Text Books

1 Kogent Learning Solutions Inc, 2011, “HTML 5 in simple steps”, 2011, DreamtechPress,New Delhi

2 Murray,Tom/Lynchburg,2002,"Creating a Web page and web site ",2002,College

References

1 Steven M. Schafer HTML, XHTML, and CSS Bible, 5ed Wiley India.

2 John Duckett Beginning HTML, XHTML, CSS, and JavaScript Wiley India.

3 Ian Pouncey, Richard York, Beginning CSS: Cascading Style Sheets for Web Design Wiley India

4 Kogent Learning Web Technologies: HTML, JavaScript Wiley India.

191TL1A4AA	பகுதி – 4 : அடிப்படைத்தமிழ் - தாள் : II (Basic Tamil)	SEMESTER IV

Total Credits: 2

Total Instruction Hours: 24 h

இளங்கலை 2019–20ஆம் கல்வியாண்டு முதல் சேர்வோர்க்குரியது

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

(பருவத் தேர்வு உண்டு)

அலகு : 1 12 h

நீதி நூல்கள்

I.ஆத்திசூடி - "அறம் செய விரும்பு" முதல் "ஔவியம் பேசேல்"வரை -12 பாடல்கள்

II.கொன்றைவேந்தன் - "அன்னையும் பிதாவும் முன்னறி தெய்வம்" முதல்

"எண்ணும் எழுத்தும் கண் எனத் தகும்" வரை -7 பாடல்கள்

III.திருக்குறள் - 6 பாடல்கள்

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

அலகு : 2 12 h

I. எளிய நீதிக்கதைகளும் வாழ்க்கை முறைகளும்

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

II. தமிழகப் பண்பாடுகள்

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

III . பயிற்சிப் பகுதி

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

Note: பயிற்சிப் பகுதியில் வினாக்கள் அமைத்தல் கூடாது

வினாத்தாள் அமைப்பு முறை - மொத்த மதிப்பெண்கள் - 100

பகுதி – அ

சரியான விடையைத் தேர்வு செய்தல் 10x2=20

பகுதி – ஆ

சரியா? தவறா? தேர்ந்தெடுத்து எழுதுக . 10x2=20

பகுதி - இ

ஒரு பக்க அளவில் விடையளிக்க 03x20=60

குறிப்பு:

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

Text Books

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

References

1 ஒன்றாம் வகுப்பு பாடநூல் - தமிழ்நாடு அரசு பாடநூல் கழகம்

2 வலைதள முகவரி : http://tamilvu.org

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

Total Credits: 2

Total Instruction Hours: 24 h

இளங்கலை 2019– 2020 ஆம் கல்வியாண்டு முதல் சேர்வோர்க்குரியது

(10 மற்றும் 12 – ஆம் வகுப்புகளில் தமிழ் மொழிப்பாடம் பயின்றவர்களுக்கு உரியது

(பருவத் தேர்வு உண்டு)

அலகு – 1 05 h

திருக்குறள்

I அறத்துப்பால்

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

II பொருட்பால்

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

III இன்பத்துப்பால்

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

அலகு – 2 05 h

கட்டுரைத் தொகுப்பு

I நல்வாழ்வு - டாக்டர் மு.வரதராசன்

1. நம்பிக்கை
2. புலனடக்கம்
3. பண்பாடு

II இளைஞர்களின் ஒளிமயமான எதிர்காலத்திற்கு - கு.வெ. பாலசுப்பிரமணியம்

1. காலக்கணக்கு
2. நற்பழக்கமே செல்வம்

அலகு – 3 05 h

I காப்பியங்கள் - குறிப்பு எழுதுதல்

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

II ஊடகம் - காட்சி ஊடகங்கள்

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

அலகு – 4 05 h

இலக்கணம் - வழக்கறிதல்

1. இயல்பு வழக்கு
2. தகுதி வழக்கு

அலகு – 5 04 h

I படைப்பாற்றல் பகுதி

கவிதை,கட்டுரை எழுதச்செய்தல் - பொதுத் தலைப்பு

II பயிற்சிப் பகுதி

தமிழில் தட்டச்சு செய்தல் - யூனிகோடு எழுத்துருவில்.

Note: பயிற்சிப் பகுதியில் வினாக்கள் அமைத்தல் கூடாது

வினாத்தாள் அமைப்பு முறை - மொத்த மதிப்பெண்கள் - 100

பகுதி –அ

சரியான விடையைத் தேர்வு செய்தல் 10x2=20

பகுதி –ஆ

கோடிட்ட இடங்களை நிரப்புக 10x2=20

பகுதி –இ

இரண்டு பக்க அளவில் விடையளிக்க 4x15=60

குறிப்பு :

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

Text Books

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

References

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

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

3 வலைதள முகவரி : http://tamilvu.org

192PY1A4AA	AECC : GENERAL AWARENESS	SEMESTER IV

Total Credits: 2
Total 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

References

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.

26/11/20

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

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

Dr.NGPASC
COIMBATORE | INDIA

Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
Fifth Semester										
Part – III										
194CT1A5CA	Core -VIII	Data Communication and Networks	4	0	0	3	25	75	100	4
194CS1A5CA	Core- IX	C# Programming	4	0	0	3	25	75	100	4
194CS1A5CB	Core -X	Computer Graphics	3	1	0	3	25	75	100	3
194IT1A5CB	Core -XI	Cyber Crime and Digital Forensic	4	0	0	3	25	75	100	4
194CS1A5CP	Core Practical- VI	Programming in C#	0	0	4	3	40	60	100	2
194CS1A5CQ	Core Practical - VII	Computer Graphics	0	0	4	3	40	60	100	2
194CS1A5DA	DSE – I	NoSQL Database	4	0	0	3	25	75	100	4
194CS1A5DB		Software Testing								
194CS1A5DC		Mobile Computing								
194CS1A5TA	IT	Industrial Training	Grade A to C							
194CS1A5LA	LoP	Lab on Project	-	-	-	-	50	-	50	1
Part – IV										
192MT1A5AA	AECC - V	Research Methodology	2	0	0	3	-	50	50	2
		Total	**21**	**1**	**8**	**-**	**-**	**-**	**800**	**26**

Course Code	Course Name	Category	L	T	P	Credit
194CT1A5CA	DATA COMMUNICATION AND NETWORKS	CORE	4	-	-	4

PREAMBLE

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	K3
CO4	Understand the ISDN Architecture, Internetworking concepts and Basics of TCP/IP	K3
CO5	Apply TCP and UDP formats.	K3

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

194CT1A5CA	DATA COMMUNICATION AND NETWORKS	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 II Data Transmission Modes, Multiplexing and Transmission Media 12 h

Modes of Data Transmission and Multiplexing: Parallel and Serial Communication – Asynchronous, Synchronous and Isochronous Communication – Simplex, Half-duplex, 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 8 h

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	P	Credit
194CS1A5CA	C# PROGRAMMING	CORE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

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

COURSE OUTCOMES

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

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

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

194CS1A5CA	C# PROGRAMMING	SEMESTER V

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Introduction to Visual C#.Net 9 h

Introduction-.Net Framework-.Net Base Classes VC#.Net Language-Development and Execution of a simple VC#.Net Program in the Command Prompt Window. Features in Visual Studio.Net: Start page-Solution Explorer Window-Class View window-Object Browser-Code Window. Data Types and Console I/O: Value types and Reference types-Boxing and Unboxing-variable declaration and Initialization-Data type conversion-Console I/O functions.

Unit II Control Statement 9 h

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

Unit III Interface 10 h

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

Unit IV Window Applications 10 h

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

Unit V Data base and web applications 10 h

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

Text Books

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

References

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

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

Course Code	Course Name	Category	L	T	P	Credit
194CS1A5CB	COMPUTER GRAPHICS	CORE	3	1	0	3

PREAMBLE

This course has been designed for students to learn and understand

- The basic algorithms and the dimensions of computer graphics
- The core concepts of Computer Graphics with Pycairo libraries.
- Effective programs for solving graphics problems.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the overview of Pycairo and Basic drawing operations.	K1
CO2	Apply various Transforms and Gradients and image fills for generating shapes.	K3
CO3	Learn the Clipping, Masking and Compositing on graphics objects	K2
CO4	Learn about Adding Widgets and Layout Management.	K2
CO5	Implementing the customization using different controls	K3

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

194CS1A5CB	COMPUTER GRAPHICS	SEMESTER V

Total Credits: 3

Total Instruction Hours: 48 h

Syllabus

Unit I Introduction and Basic Operations 9 h

Introduction to vector graphics: Pixel images – Size and Resolution – Resizing pixel images – Drawing on pixel images – Vector graphics – Rendering – Typical uses – Benefits – Disadvantages – Common vector formats. About Pycairo. Basic Drawing operations: Creating an image with Pycairo – Coordinate system – Rectangles – Fill and Stroke – Lines – Polygons – Open and closed shapes – Arcs – Circles – Bezier curves – Line styles.

Unit II Complex Shapes and Text 9 h

Paths and complex shapes: Paths – Sub-paths – Lines – Polygons – Arcs - Bezier curves - Function curves – Rectangle. Computer color: RGB color – Pycairo RGB colors – CSS named colors – Transparency – Transparency color calculation – Transparent images – Greyscale images – Pixel colors. Working with text: Text is just shapes – How Pycairo handles text – Fonts – Font size – Font style – Text extents – Text extent examples – Text alignment.

Unit III Image Fills, Clipping, Masking and Compositing 10 h

Gradients and image fills: Patterns – Solid Pattern – Linear gradient – Linear gradients at different angles – Adding more stops – Extend options – Filling a stroke with gradient – Filling text with a gradient – Radial gradients – Loading an image into Pycairo – Using Surface Pattern with an image – Using Surface Pattern with vectors.

Clipping, Masking and Compositing: Clipping – Calling clip multiple times – Resetting the clip region – Clipping functions – Masking – Using an image as a mask – Compositing – OVER operator – Changing the drawing order – Masking operations

Unit IV Adding Widgets 10 h

Creating the GUI Form and Adding Widgets : Creating our first Python GUI-Preventing the GUI from being resized-Adding a label to the GUI form- Creating buttons and changing their text property-Text box widgets-Setting the focus to a widget and disabling widgets-Combo box widgets-Creating a check button with

different initial states-Using radio button widgets-Using scrolled text widgets-Adding several widgets in a loop.

Unit V Customization 10 h

Look and Feel Customization: Creating message boxes – information, warning, and error-How to create independent message boxes- How to create the title of a tkinter window form- Changing the icon of the main root window - Using a spin box control - Relief, sunken, and raised appearance of widgets - Creating tooltips using Python - Adding a progress bar to the GUI - How to use the canvas widget.

Text Books

1. Martin McBride, 2020, "Computer Graphics in Python: Advanced Vector Graphics using Pycairo and Python", Kindle Edition, Lean Publishing, Canada.
2. Burkhard A. Meier, 2017, "Python GUI Programming Cookbook", 2nd Edition,Packt Publishing, Mumbai.

References

1. Donald Hearn, M.Pauline Baker, 2001,"Computer Graphics", 2nd Edition Prentice Hall of India, New Delhi.
2. Steven Harrington, 2007,"Computer Graphics", 2nd Edition, Mc-Graw Hill Publishers, New Delhi.
3. Mark Roseman, 2012, "Modern Tkinter for Busy Python Developers", Kindle Edition.

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

PREAMBLE

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.	K3

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

194IT1A5CB	CYBER CRIME AND DIGITAL FORENSIC	SEMESTER V

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Fundamentals of Cybercrime 8 h

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 Computer 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 Cybercrime 10 h

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 8 h

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

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

194CS1A5CP	CORE PRACTICAL: PROGRAMMING IN C#	SEMESTER V

Total Credits: 2
Total Instructions Hours: 48 h

S.No	List of Experiments
1	Write a C# program to incorporate the concept of Classes and Objects.
2	Create a C# program to implement the concept of Inheritance.
3	Write a C# program to demonstrate Exception.
4	Create a C# program to implement Events.
5	Incorporate a C# program to implement Generic controls.
6	Write a C# program to implement Advanced controls
7	Develop a C# program to host a Website.
8	Create a C# program to implement Validation controls.
9	Write a C# Program to demonstrate file concepts.
10	Create a Menu driven application using C#
11	Write a C# program to implement Ad rotator control.
12	Establish a connectivity between C# application and a database.

Note: Any 10 experiments are mandatory

194CS1A5CQ	CORE PRACTICAL: COMPUTER GRAPHICS	SEMESTER V

Total Credits: 2
Total Instructions Hours: 48 h

S.No	List of Experiments
1	Write a program to perform the basic drawing operations.
2	Develop a code to draw path, sub paths, lines and polygons.
3	Create a program to demonstrate the RGB colors.
4	Write a program to perform Geometric Transformations in text.
5	Create a program to implement gradients and image fills.
6	Write a program to implement clipping and masking in an image.
7	Create a program which displays a simple GUI application on screen.
8	Write a program to creating a simple PNG image
9	Create a program using button control for drawing different shapes
10	Write a program for User Registration using different controls.
11	Implement Menu control for Student application.
12	Write a program to display text in message box when specific color in Radio button control is selected.

Note: Any 10 experiments are mandatory.

Course Code	Course Name	Category	L	T	P	Credit
194CS1A5DA	NOSQL DATABASE	DSE	4	0	0	4

PREAMBLE

This course has been designed for students to learn and understand

- Basics of NoSQL Database Concepts.
- Architecture types of NoSQL Database.
- Different Types of NoSQL Database.

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 NoSQL databases	K1
CO2	Understand the Types of NoSQL Databases	K2
CO3	Learn the basics of Apache Cassandra NoSQL database	K3
CO4	Understand MongoDB Database creation and manipulation.	K3
CO5	Knowledge on Graph-Based Database	K3

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

194CS1A5DA	NOSQL DATABASE	SEMESTER V

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Introduction 9 h

Getting Started with NoSQL : History of NoSQL-What is NoSQL?- Why NoSQL?- NoSQL Databases-Types-SQL versus NoSQL- ACID versus BASE-ACID-BASE-CAP Theorem.

Unit II Types of NoSQL Databases 9 h

Introduction – Key-Value Pair Databases – Documents Databases-Querying Documents-Differences between Document and Relational Databases – Column-Family Databases– Column – Family Databases versus Key – Value and Document – Graph Databases.

Unit III Apache Cassandra 9 h

Introduction to Apache Cassandra – Features of Cassandra – Cassandra Query Language Data Types - Cassandra Query Language Shell (Cqlsh) – Collections – Cassandra Counter Column – Time-to-Live (TTL) – Alter Commands – Import from and Export to CSV.

Unit IV MongoDB 10 h

What is MongoDB? – Why MongoDB? – Terms used in RDBMS and MongoDB – Document-Collection-Embedded Document – Flexible Schema – CURD Operations – Create Database – Drop Database – Data types in MongoDB – Cursors in MongoDB.

Unit V Graph Database 11 h

Introduction to Graph Database – Creating Nodes- Create a Relationship – WHERE Clause – Create a Complete Path – Create Index- Create Constraints – Fetch All Nodes-Drop an Index – Drop a Constraint – Delete a Node – Delete Multiple nodes – Drop all Nodes – Delete a Relationship.

Text Books

1 Seema Acharya, 2020, “Demystifying NoSQL”, Kindle Edition, Wiley India Pvt. Ltd, India

References

1 Gaurav Vaish, 2013," Getting Started with NoSQL: Your guide to the world and technology of NoSQL", Packt Publishing, Kindle Edition, Mumbai.

2 Pramod J Sadalage, Martin Fowler, 2013 " NoSQL Distilled: A Brief Guide to the Emerging World of Polyglot Persistence ", 1st Edition, Pearson Education India.

Course Code	Course Name	Category	L	T	P	Credit
194CS1A5DB	SOFTWARE TESTING	DSE	4	0	0	4

PREAMBLE

This course has been designed for students to learn and understand

- Distinctions between validation tests and defect testing
- Principles of system and component testing
- Essential characteristics of tool used for test automation

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the software life cycle model	K1
CO2	Understanding the fundamentals of software testing	K2
CO3	Learn the principles of verification and validation	K3
CO4	Learn different tools used for software testing	K3
CO5	Apply the testing metrics with current scenario	K3

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

194CS1A5DB	SOFTWARE TESTING	SEMESTER V

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Software development Life cycle models 8 h

Phases of software project – Quality, quality assurance and quality control – Testing, verification and validation – Process model to represent different phases – Life cycle models – White box testing: What is white box testing – Static testing – Structural testing – Challenges in white box testing.

Unit II Black box testing 9 h

What is black box testing – Why black box testing – When to do black box testing – How to do black box testing – Integration testing – What is integration testing – Integration testing as a type of testing – Integration testing as a phase of testing – Scenario testing – Defect bash.

Unit III System and acceptance testing 9 h

Why system testing done – Functional system testing – Non-functional testing – Acceptance testing. Performance testing: Methodology for performance Testing – Tools for performance testing – Regression Testing: What is regression testing – Types of regression testing – When to do regression testing – How to do regression testing.

Unit IV Ad hoc testing 10 h

Buddy testing – Pair testing – Exploratory testing – Iterative testing – Agile and extreme testing – Defect seeding. Usability and accessibility testing: What is usability testing – Approach to usability – When to do usability testing – How to achieve usability – Quality factors for usability – Aesthetics testing – Accessibility testing – Tools for usability

Unit V Test Metrics and Measurements 12 h

What are metrics and measurements – Why metrics in testing – Types of metrics – Project metrics – Effort variance – Schedule variance – Effort distribution – Progress metrics – Test defect metrics – Development defect metrics – Productivity metrics.

Text Books

1 Srinivasan Desikan, Gopalaswamy Ramesh, 2013, “Software Testing”, 1st Edition, Pearson Education, India.

References

1 Louis Tamres, 2006, “Introduction Software Testing”, 1st Edition, Pearson Education, India.

2 Marnie.l.Hutcheson, 2007,”Software Testing Fundamentals”, 1st Edition, Wiley Publications, India.

3 M G Limaye, 2009, “Software Testing Principles, Techniques and Tools”, 1st Edition, Tata McGraw Hill, New Delhi.

Course Code	Course Name	Category	L	T	P	Credit
194CS1A5DC	MOBILE COMPUTING	DSE	4	0	0	4

PREAMBLE

This course has been designed for students to learn and understand

- Mobile communication introduction and fundamentals.
- The mobile service providers with their architecture.
- The basics of Wireless Application Protocol and markup language

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Learn the fundamentals mobile communication with current scenario	K1
CO2	Understand the telecommunication system	K2
CO3	Learn the network layer and concepts of routing packets.	K1,K3
CO4	Understand mobile transport layer process.	K2,K3
CO5	Knowledge on Wireless Application Protocol architecture and WML	K2,K3

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

194CS1A5DC	MOBILE COMPUTING	SEMESTER V

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Introduction 8 h

Applications - History of Wireless communication- Market for Mobile communications – A simplified reference model - Medium Access Control – Motivation for a specialized MAC – SDMA – FDMA – TDMA – CDMA.

Unit II Telecommunication systems 10 h

GSM - Mobile services - System architecture - Radio interface – Protocols - Localization and calling – Handover – Security - New data services – DECT – System architecture – Protocol Architecture.

Unit III Mobile Network Layer 10 h

Mobile IP – Goals, assumptions and requirements – Entities and terminology – IP packet delivery – Agent discovery – Registration- Tunneling and encapsulation – Optimizations – Reverse tunneling – IPv6 – IP micro-mobility support – Dynamic Host Configuration Protocol – Mobile ad-hoc networks.

Unit IV Mobile Transport Layer 10 h

Traditional TCP – Congestion control – Slow start – Fast retransmit/fast recovery – Implications of mobility – Classical TCP improvements – Indirect TCP – Snooping TCP – Mobile TCP – Fast retransmit/fast recovery – Transmission / Time-out freezing – Selective retransmission – Transaction-oriented TCP.

Unit V Wireless Application Protocol 10 h

Architecture – Wireless datagram protocol – Wireless transport layer security – Wireless transaction protocol – Wireless session protocol – Wireless application environment – Wireless markup language.

Text Books

1 J. Schiller, 2003, "Mobile Communications", Second Edition, Pearson Education Limited, India.

References

1 Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, 2003, “Principles of Mobile Computing”, 2nd Edition, Springer.

2 Asoke K Talker, Roopa R Yavapai, 2010, "Mobile Computing: Technology, Applications And Service Creation", 2nd Edition, Tata McGraw Hill, India.

3 RajKamal, 2018, "Mobile Computing", 2nd Edition, Oxford University Press, India.

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

PREAMBLE

This course has been designed for students to learn and understand

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

COURSE OUTCOMES

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

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

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

192MT1A5AA	RESEARCH METHODOLOGY	SEMESTER V

Total Credits: 2

Total Instruction Hours: 24 h

Syllabus

Unit I Introductionto Research 4 h

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

Unit II Hypotheses, Theories and Laws 6 h

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

Unit III Experimentationand research 5 h

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

Unit IV Scientific method and Research Design 4 h

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

Unit V Ethics and Responsibility in Scientific Research 5 h

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

Text Books

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

References

1 Thomas, C.G. (2015) Research Methodology and Scientific Writing. Ane Books Pvt. Ltd.: New Delhi.

2 Locharoenrat, K. (2017) Research Methodologies for Beginners.Pan Stanford Publishing: Singapore.

3 Ranjit Kumar, (2014) Research Methodology: A Step-by-Step Guide for Beginners. SAGE Publications Ltd.: Singapore.

4 Kothari, C.R. Garg, G. (2009) Research Methodology Methods and Techniques. New Age International Publishers, New Delhi..

Course Code	Course Category	Course Name	L	T	P	Exam (h)	Max Marks			Credits
							CIA	ESE	Total	
Sixth Semester										
Part – III										
194CS1A6CA	Core- XII	PHP & MySQL	4	0	0	3	25	75	100	4
194CS1A6CB	Core - XIII	Data Mining and Warehousing	3	1	0	3	25	75	100	3
194CS1A6CP	Core-Practical VIII	PHP & MySQL	0	0	4	3	40	60	100	2
194CS1A6CV	Core –XIV Project	Project Work	0	0	8	3	40	60	100	4
194CS1A6DA	DSE – II	Business Intelligence	4	0	0	3	25	75	100	4
194CS1A6DB		Semantic Web								
194CS1A6DC		Multimedia Systems								
194CS1A6DD	DSE – III	Middleware Technologies	4	0	0	3	25	75	100	4
194CS1A6DE		Mobile Ad-Hoc Networks								
194CS1A6DF		Social Network Data Analytics								
Part – IV										
193BC1A6AA	AECC - VI	Innovation, IPR and Entrepreneurship	2	0	0	3	-	50	50	2
Part-V										
194CS1A6XA		Extension Activity	-	-	-	-	50	-	50	1
		Total	**19**	**3**	**8**				**700**	**24**
		Grand total							**4200**	**140**

11/10/21

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

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

Course Code	Course Name	Category	L	T	P	Credit
194CS1A6CA	PHP & MySQL	CORE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- The basic concepts of PHP and MySQL
- The working knowledge of Dynamic Web Site Design
- The HTML forms using PHP scripts and establishing connectivity between PHP and MySQL.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Acquire knowledge on basic concepts of PHP.	K2
CO2	Understand the programming concepts of PHP.	K1
CO3	Implement the HTML forms and design a dynamic webpage.	K3
CO4	Understand MySQL queries and implement various query operations.	K3
CO5	Incorporate database connectivity with PHP and MySQL.	K2

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

194CS1A6CA	PHP & MySQL	SEMESTER VI

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Introduction to PHP 9 h

Basic Syntax-Sending Data to the Web Browser-Writing Comments. -Variables-. Introducing Strings - Concatenating Strings-Introducing Numbers - Introducing Constants- Single vs. Double Quotation-Basic Debugging Steps

Unit II Programming with PHP 9 h

Creating an HTML Form - Handling an HTML Form-Conditionals and Operators-if, else if, switch-Validating Form Data-Introducing Arrays-Creating Arrays-Accessing entire Arrays - Multidimensional Arrays- Sorting Arrays- For and While Loops.

Unit III Creating Dynamic Web Sites and Introduction to MySQL 10 h

IncludingMultiple Files- Handling HTML Forms- Revisited Making Sticky Forms-Creating Your Own Functions- Introduction to MySQL-Naming Database Elements - Choosing Your Column Types- Choosing Other Column Properties - Accessing MySQL

Unit IV Advanced SQL and MySQL 10 h

Performing Joins -Inner Joins-Outer Joins-Self Joins-Grouping Selected Results - Advanced Selections- Performing FULLTEXT Searches - Optimizing Queries-Performing Transactions- Database Encryption.

Unit V Using PHP with MySQL 10 h

Modifying the Template - Connecting to MySQL - Executing Simple Queries - Retrieving Query Results - Ensuring Secure SQL - Counting Returned Records - Updating Records with PHP

Text Books

1 Larry Ullman, 2012,"PHP and MySQL for Dynamic Web Sites", Fourth Edition,Peachpit Press, California.

References

1 Luke Welling , 2016, "PHP and MySQL Web Development Paperback", Fifth Edition, Pearson Education, California.

2 Lynn Beighley & Michael Morrison, 2009, "Headfirst PHP & MySQL", First Edition, O'Reilly, California.

3 Robin Nixon, 2014, "Learning PHP, MySQL, JavaScript, CSS & HTML5": A Step-by-Step Guide to Creating Dynamic Websites, Third Edition, O'Reilly, California.

4 Brett Mclaughlin, 2012, "PHP & MySQL: The Missing Manual" , Second edition, O'Reilly, California

Course Code	Course Name	Category	L	T	P	Credit
194CS1A6CB	DATA MINING AND WAREHOUSING	CORE	3	1	-	3

PREAMBLE

This course has been designed for students to learn and understand

- The concepts of Data Ware housing and Data Mining Concepts.
- The methodologies used for analysis of data
- The various approaches with other techniques in data mining and data warehousing.

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 Data Mining, Data Warehouse and Data Marts.	K2
CO2	Assess raw input data and apply data pre-processing techniques, generalization techniques and data characterization techniques to provide suitable input for a range of data mining algorithms.	K3
CO3	Identify Associations in large databases using different techniques.	K3
CO4	Differentiate various classification and clustering techniques.	K4
CO5	Develop further interest in research and design of new Data Mining techniques.	K5

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

194CS1A6CB	DATA MINING AND WAREHOUSING	SEMESTER VI

Total Credits: 3

Total Instruction Hours: 48 h

Syllabus

Unit I Data Mining 9 h

Introduction – Why Data Mining – What is Data Mining –Which Technologies are Used- Major Issues in Data Mining - Data Preprocessing - Data Cleaning - Data Integration - Data Reduction - Data Transformation and Data Discretization.

Unit II Association Rule Mining and Classification 10 h

Mining Frequent Patterns, Associations and Correlations – Frequent Itemset Mining Methods – Classification and Prediction - Basic Concepts - Decision Tree Induction - Bayesian Classification – Rule Based Classification – Classification by Backpropagation – Support Vector Machines.

Unit III Clustering and Applications and Trends in Data Mining 10 h

Cluster Analysis - Types of Data – Categorization of Major Clustering Methods – K means – Partitioning Methods – Hierarchical Methods - Density-Based Methods – Grid Based Methods – Model-Based Clustering Methods – Clustering High Dimensional Data - Constraint – Based Cluster Analysis – Outlier Analysis.

Unit IV Data Warehousing 9 h

Data warehousing Components –Building a Data warehouse – Mapping the Data Warehouse to a Multiprocessor Architecture – Data Extraction, Cleanup, and Transformation Tools.

Unit V Business Analysis 10 h

Reporting and Query tools and Applications – Tool Categories – The Need for Applications – Cognos Impromptu – Online Analytical Processing (OLAP) – Need – Multidimensional Data Model – OLAP Guidelines – Multidimensional versus Multi relational OLAP – Categories of Tools – OLAP Tools and the Internet

Text Books

1. Jiawei Han and Micheline Kamber, 2019, “Data Mining Concepts and Techniques”, Second Edition, Elsevier.
2. Alex Berson and Stephen J. Smith, 2007, “Data Warehousing, Data Mining & OLAP”, Tenth Reprint, Tata McGraw Hill Edition.

References

1. K.P. Soman, Shyam Diwakar and V. Ajay, 2006, " Insight into Data mining Theory and Practice”, Easter Economy Edition, Prentice Hall of India.
2. Pang-Ning Tan, Michael Steinbach and Vipin Kumar, 2007, “Introduction to Data Mining”, First Edition, Pearson Education.
3. Herbert Jones, 2017, "Data Mining: The Data Mining Guide for Beginners, Including Applications for Business, Data Mining Techniques, Concepts, and More", Bravex Publications.
4. Alex Berson, 2017, "Data Warehousing, Data Mining & OLAP", McGraw Hill Education.

194CS1A6CP	CORE PRACTICAL: PHP & MySQL	SEMESTER VI

Total Credits: 2
Total Instructions Hours: 48 h

S.No	Contents
1	Write a PHP program to find the (i) Sum of Digits (ii) Factorial of a given number (iii) Palindrome Number
2	Create a PHP program to validate all the string manipulation functions in PHP
3	Create a PHP program to create and validate a registration form.
4	Create a PHP program to implement the following. (i). Chess board in PHP using for loop (ii) Pattern with * using for loop
5	Write a program to calculate Electricity bill in PHP based on the following requirements. For first 50 units – Rs. 3.50/unit For next 100 units – Rs. 4.00/unit For next 100 units – Rs. 5.20/unit For units above 250 – Rs. 6.50/unit
6	Create a HTML form using PHP and send a request to the server.
7	Create a student table in MySQL and insert five records for it.
8	Create a table named employee in My SQL and perform Alter, Update and Delete operations.
9	Write a SQL query to perform inner join, outer join, and self-join in MySQL.
10	Write a MySQL code to perform advanced search operations on a table.
11	Write a PHP program to Insert Form Data into MySQL Database.
12	Write a PHP program to retrieve data from the My SQL database.

Note: Any 10 experiments are mandatory.

194CS1A6CV	PROJECT WORK	SEMESTER VI

Total Credits: 4

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 diarywere in weekly work carried out has to be written. Guide should review the workevery week and put his/her signature. The work diary along with project reportshould 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 doneto the respective guide in the three reviews. The guide will give the marks for CIA asper 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
Total	**60 Marks**

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

Course Code	Course Name	Category	L	T	P	Credit
194CS1A6DA	BUSINESS INTELLIGENCE	DSE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- The databases, statistics and machine learning to uncover trends in large datasets.
- Sharing data analysis to stakeholders so they can draw conclusions and make decisions.
- The data specific questions, BI pulling the answers from the datasets.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand turning data analysis into visual representations	K2
CO2	Understand Exploring data through visual storytelling to communicate insights	K3
CO3	Compile multiple data sources, identifying the dimensions	K3
CO4	Evaluate the results from descriptive analytics and further exploring the data using statistics	K4
CO5	Build the data specific questions, BI pulling the answers from the datasets	K5

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

194CS1A6DA	BUSINESS INTELLIGENCE]	SEMESTER VI

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I An Overview of Business Intelligence, Analytics, and Decision Support 10 h

Changing Business Environments and Computerized Decision Support - Managerial Decision Making-Information Systems Support for Decision Making-An Early Framework for Computerized Decision Support-The Concept of Decision Support Systems (DSS)- A Framework for Business Intelligence (BI)- 8 Business Analytics Overview.

Unit II Foundations and Technologies for Decision Making 10 h

Introduction and Definitions -Phases of the Decision-Making Process-The Intelligence Phase-The Design Phase-The Choice Phase-The Implementation Phase-How Decisions Are Supported-Capabilities-Classifications-Components of DSS.

Unit III Business Reporting, Visual Analytics, and Business Performance Management 10 h

Business Reporting Definitions and Concepts-Data and Information Visualization - Different Types of Charts and Graphs-5 The Emergence of Data Visualization and Visual Analytics-Performance Dashboards-Business Performance Management-Performance Measurement-Balanced Scorecards.

Unit IV Techniques for Predictive Modeling 09 h

Basic Concepts of Neural Networks-Developing Neural Network-Based Systems-Illuminating the Black Box of ANN with Sensitivity Analysis-Support Vector Machines-A Process-Based Approach to the Use of SVM-Nearest Neighbor Method for Prediction.

Unit V Text Analytics, Text Mining, and Sentiment Analysis 09 h

Concepts and Definitions - Natural Language Processing - Text Mining Applications - Text Mining Process - Text Mining Tools - Sentiment Analysis Overview - Sentiment Analysis Applications - Sentiment Analysis Process - Sentiment Analysis and Speech Analytics.

Text Books

1. Ramesh Sharda, DursunDelen, Efraim Turban, 2016, "Business Intelligence And Analytics: Systems For Decision Support", Tenth Edition, Pearson Education Inc.
2. Meenakshi Gupta, 2020, "Business Intelligence and Applications", First Edition, Pearson Education Inc.

References

1. Carlo Vercellis, 2018, "Business Intelligence, Data mining and Optimization for Decision Making", Third Edition, Wiley.
2. Claudio Vettor, 2015, "Business Intelligence: a New Paradigm", Second Edition, Pearson Education Inc.
3. Swain Schleps, 2016, "Fundamentals of Business Intelligence", First Edition, Springer.
4. Wilfried Grossmann , 2008, "Business Intelligence For Dummies" First Edition, Springer

Course Code	Course Name	Category	L	T	P	Credit
194CS1A6DB	SEMANTIC WEB	DSE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- Semantic Web Vision.
- XML,RDF,RDFS,OWL.
- Querying Ontology and real time application.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the rationale behind Semantic Web.	K2
CO2	Remember the Structured Web Documents: XML	K1
CO3	Apply Model ontologies using Resource Description Framework (RDF).	K3
CO4	Create Model and design ontologies using Web Ontology Language (OWL).	K5
CO5	Apply Semantic web technologies to real world applications.	K3

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

194CS1A6DB	SEMANTIC WEB	SEMESTER VI

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I The Semantic Web Vision 10 h

Today's Web-From Today's Web to the Semantic Web: Examples-Semantic Web Technologies- A Layered Approach

Unit II Structured Web Documents: XML 10 h

Introduction-The XML Language- Structuring-Namespaces-Addressingand Querying XML Documents-Processing

Unit III Describing Web Resources: RDF 10 h

Introduction-RDF: Basic Ideas-RDF: XML-Based Syntax-RDF Schema: Basic Ideas-RDF Schema: The Language-RDF and RDF Schema in RDF Schema

Unit IV Web Ontology Language: OWL 10 h

Introduction-OWL and RDF/RDFS- Three Sublanguages of OWL-Description of the OWL Language-Layering of OWL-OWL in OWL

Unit V Applications 08 h

Introduction-Horizontal Information Products at Elsevier-Data Integration at Audi-e-Learning- Web Services

Text Books

1. Grigoris Antoniou, Frank Van Harmelen, 2008, "A Semantic Web Primer" Second Edition, MIT Press.
2. Johan Helm, 2001, “Creating the Semantic Web with RDF", First Edition, Wiley.

References

1. Liyang Yu, 2007, “Introduction to the Semantic Web and Semantic web services”, First Edition, Chapman & Hall/CRC, Taylor & Francis group.
2. Michael C. Daconta, Leo J. Obrst, and Kevin T. Smith, 2003, “The Semantic Web: A Guide to the Future of XML, Web Services, and Knowledge Management”, Fourth Edition, Wiley Publishing.
3. John Davies, Rudi Studer, and Paul Warren John, 2006, “Semantic Web Technologies: Trends and Research in Ontology-based Systems”, First Edition, Wiley and Son’s.
4. John Davies, Dieter Fensel and Frank Van Harmelen, 2003, “Towards the Semantic Web: Ontology- Driven Knowledge Management”, First Edition, John Wiley and Sons.

Course Code	Course Name	Category	L	T	P	Credit
194CS1A6DC	MULTIMEDIA SYSTEMS	DSE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- Concepts of multimedia and its applications.
- the various Multimedia file formats.
- About various techniques in animation.

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 Multimedia and its working environment.	K1
CO2	Understand the concepts of Image processing.	K2
CO3	Understanding Audio and Multimedia.	K3
CO4	Learn the Video concepts and file formats.	K2
CO5	Illustrate the concepts of Animation.	K3

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

194CS1A6DC	MULTIMEDIA SYSTEMS	SEMESTER VI

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Multimedia An Overview 8 h

Introduction -Multimedia Presentation and Production-Characteristics of a Multimedia Presentation-Hardware and Software Requirements -Uses of Multimedia -Analog and Digital Representations- Digitization. Text: Introduction-Types of Text – Unicode Standard – Font – Insertion of Text -Text compression–File formats.

Unit II Image 10 h

introduction - Image data representation –Image acquisition - Image Processing – Binary image processing – Grayscale image processing – color image processing – image output on monitor –image output on printer- image file formats- image processing software.

Unit III Audio 10 h

Introduction – Acoustics – Sound Waves – types and properties of sound – Components of an audio system- Digital Audio – Synthesizers – MIDI – Digital audio processing –Speech - Sound Card – Audio Transmission – Audio File formats – Surround sound systems-Digital audio Broadcasting – Audio processing software

Unit IV Video 10 h

Introduction- Motion video- Analog Video Camera – Analog Video signal representation- Television Systems- Video color spaces- Digital video- Digital video processing –Video recording and Storage formats – Video files formats-Video editing concepts- Video processing software

Unit V Animation 10 h

Introduction –Historical Background –Use of animation –Traditional animation – Principles of animation- Computer based animation- Animation on the web-3D animation- Animation file formats – Animation software

Text Books

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

References

1 Tay Vaughan, 2014, "Multimedia: Making it Work" Ninth Edition, McGraw Hill.

2 Stephen McGloughlin, 2000, "Multimedia: Concepts and Practice", First Edition, Prentice Hall

3 K. Rammohanarao, Z. S. Bolzkovic, D. A. Milanovic, 2002, "Multimedia Communication Systems", First Edition, Prentice Hall.

4 Ze-Nian Li, and Mark S. Drew, 2003, "Fundamentals of Multimedia", First Edition, Pearson Prentice Hall.

Course Code	Course Name	Category	L	T	P	Credit
194CS1A6DD	MIDDLEWARE TECHNOLOGIES	DSE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- The role of middleware in the distributed environment and its common services.
- The importance of securities and technologies present in Middleware.
- The role of middleware in cloud technologies

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Study the set of services that a middleware system constitutes.	K2
CO2	Understand how middleware facilitates the technologies in heterogeneous environments.	K3
CO3	Study the importance of security in middleware.	K3
CO4	Learn the object-oriented middleware basics through the example of the following CORBA objects.	K4
CO5	Understand the basics of open stack cloud and message oriented middleware that is the most often used middleware technique.	K5

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

194CS1A6DD	MIDDLEWARE TECHNOLOGIES	SEMESTER VI

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I **Software Architecture** 8 h

Middleware: Technology Review Sockets - Other Middlewares - Environmental Monitoring Project. Software Architectural Styles/Patterns for Middleware: Software Architecture - Architectural Styles/Patterns - Architectural Styles/Patterns for Middleware - Architectural Styles/Patterns for Distributed Object-Oriented Components - Architectural Styles/Patterns for Service-Oriented Architectures - Architectural Styles/Patterns for Web Services - Architectural Styles/Patterns for Cloud Computing.

Unit II Technologies 10 h

Internet Technologies: TCP/IP - UDP - IP Addresses - Subnetting - Port Numbers - Network Information. World Wide Web Technologies: Hypertext Transfer Protocol - HTML, XML, and HTML Forms - XML Schema Basics - JavaScript Object Notation - Internet Media Types - Base 64 Encoding - URL Encoding and URL Base 64 Encoding.

Unit III Security 10 h

Security: Symmetric Key Cryptography and Asymmetric Key/Public Key Cryptography - Hash (Message Digest) Functions - Digital Signatures and Message Authentication Codes - Public Key Infrastructure and Certificate Authorities - Transport Layer Security and Secure Sockets Layer - Cryptographic Message Syntax. Microsoft Technologies: Dynamic Link Library Files and Windows Side by Side - Common Language Runtime - Global Assemblies Cache - Named Pipes in Windows

Unit IV Components and Architectures 10 h

Cloud Technologies: Software-Defined Networking and Network Virtualization - Virtualization Security - Cloud Security. Distributed Object-Oriented Components: Common Object Request Broker Architecture. Web Services Architectures: Service-Oriented Architectures - RESTful Architectural Style and Non-RESTful versus RESTful Web Services.

Unit V Cloud Technologies 10 h

Cloud and OpenStack Cloud: OpenStack Cloud - Amazon Web Services Cloud - CloudStack Cloud. Message-Oriented Middleware: CORBA Event Service and CORBA Notification Service - Java Message Service and Message Beans - Object Management Group Data Distribution Service - Advanced Message Queueing Protocol

Text Books

1. Letha Hughes Etzkorn, 2017, " Introduction To Middleware Web Services, Object Components and Cloud Computing", First Edition, CRC Press

References

1. Aurore Savoy-Navarro, Jang Hyuk Kwon, Kum Won Cho, Ok-Hwan Byeon, Thom Dunning, 2010, "Future Application And Middleware Technology On E-Science", First Edition, Springer.
2. Flavia C. Delicato, Paulo F. Pires, Thais Batista, 2013, Middleware Solutions For The Internet of Things, First Edition, Springer.
3. S. Anitha, 2011, “Programming with Middleware Technologies” First Edition, Ane Books Pvt. Ltd.
4. G. Sudha Sadasivam, 2009, “Middleware & Enterprise Integration Technologies”, First Edition, Wiley.

Course Code	Course Name	Category	L	T	P	Credit
194CS1A6DE	MOBILE AD-HOC NETWORKS	DSE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- Basic concepts of Mobile Ad-Hoc Networks and Routing Protocols.
- Tools for modeling and Simulation in Mobile Ad-Hoc Networks.
- Channel allocation for Mobile Ad-Hoc Networks.

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 Mobile Ad-Hoc Networks.	K2
CO2	Understand the implementation of different Routing Protocols.	K3
CO3	Knowledge on Modeling and Simulation tools for Mobile Ad-Hoc Networks.	K4
CO4	Understand the use of Intelligent Optimization technique for Routing.	K3
CO5	Learn different types of Channel Assignment Wireless Mobile Ad Hoc Networks.	K3

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

194CS1A6DE	MOBILE AD-HOC NETWORKS	SEMESTER VI

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Mobile Ad Hoc Network 8 h

Introduction - Wireless Networks- Mobile Ad Hoc Network- Mobile Ad Hoc Network History- Mobile Ad Hoc Network Definition- MANET Applications and Scenarios- Ad Hoc Network Characteristics- Classification of Ad Hoc Networks.

Unit II Mobile Ad Hoc Routing Protocols 10 h

Introduction-Taxonomy of Ad Hoc Routing Protocols- On-Demand Ad Hoc Routing Protocols- Table-Driven Ad Hoc Routing Protocols- Hybrid Ad Hoc Routing Protocols- Description of Current Ad Hoc Routing Protocols- Importance of Routing Protocols in MANET.

Unit III Modeling and Simulation Tools for Mobile Ad Hoc Networks 10 h

Introduction- Modeling- Network Models- Topology Control Models- Mobility Models- Simulation- ns2 Simulator- TOSSIM Simulator- OPNET Simulator- OMNeT++ Simulator- Other Simulators.

Unit IV New Approaches to Mobile Ad Hoc Network Routing 10 h

Introduction- Multicriteria Optimization Applied to MANET Routing- Characterization of an Optimization Problem – Multicriteria Optimization Methods – Applicability of Multicriteria Optimization to MANET Routing – Artificial Intelligence

Unit V Channel Assignment in Wireless Mobile Ad Hoc Networks 10 h

Introduction-Channel Assignment Problem – Channel Assignment Schemes – Fixed Channel Assignment Schemes – On-Demand Channel Assignment schemes – Contention-Based Channel Assignment - Case Study : Vehicular Ad Hoc Networks.

Text Books

1 Jonathan Loo, Jaime Lloret Mauri, Jesús Hamilton Ortiz, 2012, "Mobile Ad Hoc Networks: Current Status and Future Trends", CRC Press.

References

1 K Toh, 2015, "Adhoc mobile wireless networks, Protocols and Systems", 2nd Edition, Pearson Education.

2 George Aggelou, 2010, "Mobile Ad Hoc Networks",1st Edition, McGrawHill,

3 C.Siva Ram Murthy and B. Smanoj, 2006, "Ad Hoc Wireless Networks – Architectures and Protocols", 2nd Edition, Pearson Education.

4 Balhara Surjeet, 2013, "Mobile Ad Hoc Networks", First Edition, LAP Lambert Academic Publishing.

Course Code	Course Name	Category	L	T	P	Credit
194CS1A6DF	SOCIAL NETWORK DATA ANALYTICS	DSE	4	-	-	4

PREAMBLE

This course has been designed for students to learn and understand

- The concept of semantic web and related applications.
- Knowledge representation using ontology.
- Social semantic applications.

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand a social network analysis.	K2
CO2	Understand the Web data and semantics in social network applications.	K3
CO3	Model and aggregate the social network data.	K3
CO4	Develop social–semantic applications	K4
CO5	Evaluate the social network extraction with case studies.	K5

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

194CS1A6DF	SOCIAL NETWORK DATA ANALYTICS	SEMESTER VI

Total Credits: 4

Total Instruction Hours: 48 h

Syllabus

Unit I Introduction to the Semantic Web and Social Networks 10 h

Introduction to Semantic Web: Limitations of current Web – Development of Semantic Web – Emergence of the Social Web – Social Network analysis: Development of Social Network Analysis – Key concepts and measures in network analysis – Electronic sources for network analysis: Electronic discussion networks, Blogs and online communities – Web-based networks.

Unit II Modelling, Aggregating and Knowledge Representation 10 h

Ontology and their role in the Semantic Web: Ontology-based knowledge Representation – Ontology languages for the Semantic Web: Resource Description Framework – Web Ontology Language – Modelling and aggregating social network data: State-of-the-art in network data representation – Ontological representation of social individuals – Ontological representation of social relationships – Aggregating and reasoning with social network data.

Unit III Developing Social-Semantic Applications 09 h

Building Semantic Web applications with social network features - The generic architecture of Semantic Web applications -Sesame – Elmo – GraphUtil - The features of Flink - System design – open academia: distributed, semantic-based publication management - The features of open academia - System design.

Unit IV Evaluation of Social Network Analysis 10 h

Evaluation of web-based social network extraction - Data collection - Preparing the data - Optimizing goodness of fit - Comparison across methods and networks - Predicting the goodness of fit - Evaluation through analysis - Semantic-based Social Network Analysis in the sciences - Data acquisition - Representation, storage and reasoning- Visualization and Analysis – Results - Descriptive analysis - Structural and cognitive effects on scientific performance.

Unit V Semantic-based Social Network analysis in the Sciences and Case Studies 09 h

Semantic-based Social Network analysis in the Sciences:Context-Methodology-Results.Case Studies: Ontology emergence in del.icio.us- Community-based ontology extraction from webpages-Evaluation.Conclusion: The Perfect Storm.

Text Books

1. Peter Mika, 2007, "Social Networks and the Semantic Web" First Edition, Springer.
2. Borko Furht, 2010, "Handbook of Social Network Technologies and Applications", 1st Edition, Springer.

References

1. GuandongXu, Yanchun Zhang and Lin Li, 2011, "Web Mining and Social Networking – Techniques and applications", First Edition, Springer.
2. Dion Goh and Schubert Foo, 2008, "Social information Retrieval Systems: Emerging Technologies and Applications for Searching the Web Effectively", IGI Global Snippet.
3. Max Chevalier, Christine Julien, and Chantal Soulé-Dupuy, 2009, "Collaborative and Social Information Retrieval and Access: Techniques for Improved user Modelling" IGI Global Snippet.
4. John G. Breslin, Alexander Passant and Stefan Decker, 2009, "The Social Semantic Web", Springer.

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

PREAMBLE

This course has been designed for students to learn and understand

- The role of Entrepreneurship in Economic Development and basics of Intellectual Property Rights, Copy Right Laws, Trade Marks and Patents
- Ethical and professional aspects related to intellectual property law context
- Intellectual Property(IP) as an career option

COURSE OUTCOMES

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

CO Number	CO Statement	Knowledge Level
CO1	Understand the concept of innovation, IPR, entrepreneurship and its role in economic development	K2
CO2	Know the value , purpose and process of Patent	K2
CO3	Understand the basics of trademarks and industrial designs	K2
CO4	Acquire knowledge about copyright and copyright law	K2
CO5	Identify Geographical Indications	K2

MAPPING WITH PROGRAMME OUTCOMES

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

S Strong M Medium L Low

193BC1A6AA	INNOVATION, IPR AND ENTREPRENEURSHIP	SEMESTER VI

Total Credits: 2

Total Instruction Hours: 24 h

Syllabus

Unit I Introduction to Innovation, IPR and Entrepreneurship 05 h

Meaning of Creativity, Invention and innovation - Types of Innovation - Introduction and the need for Intellectual Property Right (IPR) - Kinds of IPR – National IPR Policy. Entrepreneurs-Concept, characteristics, Functions, need and types, Entrepreneurial decision process. Role of Entrepreneurship in Economic Development.

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

Unit II Patents 05 h

Introduction and origin of Patent System in India- Conceptual Principles of Patent Law in India - Process for obtaining patent - Rights granted to a Patentee - Infringement of Patent.
Case Study: When Google was used for Patent Infringement.

Unit III Trademarks 05 h

Origin of Trade Marks System - Types - Functions - Distinctiveness and Trademarks - Meaning of Good Trademark - Rights granted by Registration of Trademarks - Infringement of trademark.
Case Study: Trademark mismanagement by Cadbury's.

Unit IV Copyright 05 h

Introduction and Evolution of Copyright - Objectives and fundamentals of Copyright Law - Requirements for Copyrights - Works protectable under Copyrights - Authorship and Ownership - Rights of Authors and Copyright owners - Infringement of Copyright.
Case Study: Copyright Case of Napster and Grokster.

Unit V Geographical Indications 04 h

Introduction and Concept of Geographical Indications - History - Administrative Mechanism - Benefits of Geographical Indications - Infringement of registered Geographical Indication.
Case Study: The story of the Tirupati Laddu.

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

Text Book

1 Nithyananda, K V. 2019, "Intellectual Property Rights, Protection and Management", Cengage Learning India Private Limited, New Delhi, India.

2 Dr. S. S. Khanka, 2020,"Entrepreneurial Development", S Chand and Company Limited, New Delhi, India.

References

1 Ahuja, V K. 2017, "Law relating to Intellectual Property Rights", 3rd Edition, Lexis Nexis, Gurgaon, India.

2 Neeraj, P., & Khusdeep, D., 2014, "Intellectual Property Rights", 1st Edition, PHI Learning Private Limited, New Delhi, India.

3 http://www.bdu.ac.in/cells/ipr/docs/ipr-eng-ebook.pdf.

4 https://knowledgentia.com/knowledgeate.

11/12/21

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