Learning Outcomes based Curriculum Framework (LOCF)

for

Bachelor of Technology (Computer Science) B.Tech. (CS)

(w.e.f. 2022-23)



Department of Computer Science and Information Technology School of Technology MAULANA AZAD NATIONAL URDU UNIVERSITY

1. Vision and Mission

1.1 Vision

To meet the requirements of the society by imparting knowledge, ethics and moral values with a holistic approach.

1.2 Mission

To impart quality education and to undertake research and extension with emphasis on application and innovation that cater to the emerging societal needs through all-round development of students of all sections enabling them to be globally competitive and socially responsible citizens embedded with ethical values.

1.3 Strategies for Attaining the Vision and Fulfilling the Mission

Following strategies will be used to ensure the accomplishment of the stated vision and mission:

- 1. To create an ambiance for healthy teaching-learning process and attract the motivated students to the Department of Computer Science and Information Technology
- 2. Ensure that the curriculum followed is comparable to the relevance of local, national, regional and global development
- 3. To motivate the potential faculty members/ educators who are constantly upgrading their pedagogical approaches to motivate students and to enhance learning among them
- 4. Provide opportunities to students for global exposure, industrial internships, project based and research-based learning

2. Program Educational Objectives

Program Educational Objectives (PEOs) are broad statements that describe the career and professional accomplishments that CS&IT Department is preparing its graduates to achieve during the graduation. Following four PEOs are defined as:

PEO 1. Graduates using their acquired knowledge, competence and skill sets will develop into globally competent and locally relevant professionals through training and experiential learning enhancing their professional competence throughout their professional career.

PEO 2. Graduates will pursue knowledge and innovation-based development process to find solutions to problems in real life situation that satisfy technical performance specification.

PEO 3. Graduates will play adaptive leadership role in industry, government, education and R&D sectors to boost productivity and contribute economic development.

PEO 4. Graduates will be active members ready to serve the society locally and internationally apart from cultural needs, social awareness and responsibility.

3. Program Outcomes (POs)

Program outcomes are the narrower statements that describe what students are expected to know and be able to do upon graduation. POs represent the knowledge, skills and attitudes the

students should have at the end of a program. Following are the statements for POs for CSE program. At the time of completing their degree requirements, students will be able to:

- **PO₁:** Apply the knowledge of Mathematics, Science, and Engineering fundamentals, and an engineering specialization to solution of complex engineering problems **(Engineering Knowledge)**.
- **PO**₂: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences (**Problem analysis**).
- **PO₃:** Design of solutions for complex engineering problems and design of system components or processes that meet the specified needs with appropriate considerations of public health and safety, and cultural, societal, and environmental considerations (**Design/development of solutions**).
- **PO**₄: Use research-based methods including design of experiments, analysis and interpretation of data and synthesis of information leading to logical conclusions **(Conduct investigations of complex problems)**.
- **PO**₅: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling complex engineering activities with an understanding of limitations (**Modern tool usage**).
- **PO**₆: Apply reasoning within the contextual knowledge to access societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice (**The engineer and society**).
- **PO**₇: Understand the impact of the professional engineering solutions in the societal and environmental contexts, and demonstrate the knowledge of, and the need for sustainable developments (Environment and sustainability).
- **PO**₈: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice (**Ethics**).
- **PO**₉: Function effectively as an individual independently and as a member or leader in diverse teams, and in multidisciplinary settings (**Individual and team work**).
- **PO**₁₀: Communicate effectively on complex engineering activities with the engineering community and with society at large such as being able to comprehend and write effective reports and design documentation, make effective oral presentations, and give and receive clear instructions (**Communication**).
- **PO₁₁:** Demonstrate knowledge and understanding of engineering management principles and apply those to one's own work as a member and leader of a team to manage projects in multidisciplinary environments (**Project management and finance**).
- **PO**₁₂: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change (**Life-long Learning**).

4. Program Specific Outcomes (PSOs)

Program Specific Outcomes (PSOs) are the statements that define outcomes of a program which make students realize the fact that knowledge and techniques learnt in a specific course has direct implication for the betterment of society and its sustainability.

- **PSO 1:** The ability to design and develop computing systems using the knowledge of Mathematics, Science and Engineering fundamentals.
- **PSO 2:** Ability to test and analyze the quality of developed applications and to integrate them in order to evolve a larger computing system.
- **PSO 3:** Apply appropriate techniques, resources, and modern engineering and IT tools to address societal, health, safety, legal, and cultural issues.
- **PSO 4:** To analyze and assess various functional and technical security challenges as per local needs and global standards.

PSOs have to be attained by the students in due course of the four years program either as part of their Core, Basic Sciences, Engineering Sciences or as part of their various levels of projects, compulsory courses of Humanities & Social Sciences areas.

5. Mapping between PEOs, POs and PSOs

The following Table lists the relationships between the PEOs, POs. and PSOs. The attainment of POs can be viewed as a strategy for attaining the PEOs. Each PEO is supported by multiple POs to ensure strength in compliance. Also, the relationship between individual PO and PEOs can vary between **Reasonable (1)** and **Strong (3)**.

DEOr		POs								PSOs						
PEOs	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4
PEO1	2	2	1	2	3	2	2	2	2	2	1	2	2	1	2	2
PEO2	2	1	2	1	2	1	1	3	1	1	2	1	2	2	3	2
PEO3	1	2	2	3	3	2	2	1	2	3	1	2	1	3	1	1
PEO4	3	3	1	2	1	1	1	2	1	2	3	2	3	2	2	2

- 1 Reasonable
- 2 Significant
- 3 Strong

6. Course Outcomes (COs)

Course Outcomes are narrower statements that describe what students are expected to know and be able to do at the end of the course. Course outcomes are defined for all courses as part of the syllabus for the course and are measured through performance on assignments, written and oral presentation reports related to individual and team projects and through the mid-term and semester end examinations. Detailed syllabi for each course associated with Course Objectives and Course Outcomes has been for specific outcomes associated with the course. Attaining the COs is at the heart of the educational activity. If COs of individual courses are successfully attained and the curriculum has been designed to achieve the Program Outcomes, then attainment of the POs is also ensured. An effective Assessment Plan has been devised to meet the objective, quantitative and independent measures to demonstrate that all POs and PEOs are being attained by the program.

7. Continuous Quality Improvement and Assessment Plan

The purpose of the Assessment Plan is to ensure attainment of all Program Outcomes (POs) and also the attainment of the Program Educational Objectives (PEOs) and to independently confirm that the POs and PEOs are being attained. Periodic monitoring of progress allows faculty members and the leadership to take corrective actions where the POs and PEOs are not meeting established targets. The process consists of assessing and evaluating the extent to which the student outcomes are being attained. The results of these assessments and evaluations are subsequently used as the primary inputs for making improvements to the program.

MAULANA AZAD NATIONAL URDU UNIVERSITY SCHOOL OF TECHNOLOGY DEPARTMENT OF COMPUTER SCIENCE & IT

B.Tech. (Computer Science)

General, Course structure & Theme & Semester-wise credit distribution

A. Definition of Credit:							
1 1 Hr. Lecture (L) per week 1 credit							
2	1 Hr. Tutorial (T) per week	1 credit					
3	1 credit						

B. Range of credits:

A student requires to complete total 180 credits to be eligible to get Under Graduate degree in Engineering.

C. Stru	cture of Undergraduate Engineering program:							
S. No.		Credit Breakup for						
		B.Tech. Students						
1	Humanities and Social Sciences including Management courses	09						
2	Basic Science courses	24						
3	Engineering Science courses including workshop, drawing, basics of electrical/mechanical/computer etc	28						
4	Professional core courses	66						
5	Professional Elective courses relevant to chosen specialization/branch	32						
6	Open subjects – Electives from other technical and/or emerging subjects	6						
7	Project work, seminar and internship in industry or elsewhere	15						
8	Mandatory Courses [Environmental Sciences, Induction Program, Indian Constitution]	(non-credit)						
	Total 180							

		PROFE			RSES [PCC]		
SL.	Code No.	Course Title	H	ours per w		Total	Semester
No.	Coue no.	Course mue	Lecture	Tutorial	Practical	Credits	Semester
1	BTCS311PCT	Data Structure & Algorithms	3	1	0	4	3
2	BTCS362PCP	IT Workshop Python	0	0	4	2	3
3	BTCS407PCT	Discrete Mathematics	3	1	0	4	4
4	BTCS511PCT	Computer Organization	3	1	0	4	5
5	BTCS403PCT	Operating Systems	3	1	0	4	4
6	BTCS513PCT	Design & Analysis of Algorithms	3	1	0	4	5
7	BTCS402PCT	Database Management Systems	3	1	0	4	4
8	BTCS512PCT	Formal Language & Automata Theory	3	1	0	4	5
9	BTCS405PCT	Object Oriented Programming	3	1	0	4	4
10	BTCS611PCT	Compiler Design	3	1	0	4	6
11	BTCS612PCT	Computer Networks	3	1	0	4	6
12	BTCS312PCT	Digital Electronics	3	1	0	4	3
					Total	46	

PROFESSIONAL CORE COURSES [PCC]

PROFESSIONAL ELECTIVE [PEC]

SL.	Code No.	Course Title	H	ours per w	eek	Total	Semester
No.			Lecture	Tutorial	Practical	Credits	
1	PEC	Elective – I	3	1	0	4	5
2	PEC	Elective – II	3	1	0	4	6
3	PEC	Elective – III	3	1	0	4	6
4	PEC	Elective – IV	3	1	0	4	7
5	PEC	Elective – V	3	1	0	4	7
6	PEC	Elective – VI	3	1	0	4	8
7	PEC	Elective – VII	3	1	0	4	7
8	PEC	Elective – VIII	3	1	0	4	8
					Total	32	

SL.	Code No.	Course Title	H	ours per w	eek	Total	Semester		
No.			Lecture	Tutorial	Practical	Credits			
1	OEC	Open Elective – I	3	0	0	3	6		
2	OEC	Open Elective – II	3	0	0	3	7		
		6							

OPEN ELECTIVE [OEC]

MAULANA AZAD NATIONAL URDU UNIVERSITY

DEPARTMENT OF CS&IT SCHEME OF INSTRUCTIONS, EXAMINATION & EVALUATION (Effective for Batch Admitted from 2022-23 Academic Year)

B.Tech. (Computer Science)

Total Credits (4 Year Course): 180

I. INDUCTION PROGRAM (F	PLEASE REFER APPENDIX-A FOR GUIDELINES)
Induction Program	3 Weeks duration
(mandatory)	(Please refer Appendix-A for guidelines & also details
	available in the curriculum of Mandatory courses)
Induction program for students to be offered	 Physical activity
right at the start of the first year.	Creative Arts
	 Universal Human Values
	 Literary
	 Proficiency Modules
	 Lectures by Eminent People
	 Visits to local Areas
	 Familiarization to Dept./Branch & Innovations

<u>Schedule</u>

The activities during the Induction Program would have an Initial Phase, a Regular Phase and a Closing Phase. The Initial and Closing Phases would be two days each.

Initial Phase	
Time	Activity
Day 0	
Whole day	Students arrive - Hostel allotment. (Preferably do pre-allotment)
Day 1	
09:00 am - 03:00 pm	Academic registration
04:30 pm - 06:00 pm	Orientation
Day 2	
09:00 am - 10:00 am	Diagnostic test (for English etc.)
10:15 am - 12:25 pm	Visit to respective depts.
12:30 pm - 01:55 pm	Lunch
02:00 pm - 02:55 pm	Director's address
03:00 pm - 05:00 pm	Interaction with parents
03:30 pm - 05:00 pm	Mentor-mentee groups - Introduction within group. (Same as Universal
	Human Values groups)
Regular Phase	

After two days is the start of the Regular Phase of induction. With this phase there would be regular program to be followed every day.

3.2.1 Daily Schedule

Some of the activities are on a daily basis, while some others are at specified periods within the Induction Program. We first show a typical daily timetable.

Sessn.	Time	Activity	Remarks				
Day 3 onw	ards						
	06:00 am	Wake up call					
Ι	06:30 am - 07:10 am	Physical activity (mild ex	ercise/yoga)				
	07:15 am - 08:55 am	Bath, Breakfast, etc.					
II	09:00 am - 10:55 am	Creative Arts / Universa	l Human Values				
		Half the groups do Creative Arts					
III	11:00 am - 12:55 pm	Universal Human Values /					
		Creative Arts	Complementary alternate				
	01:00 pm - 02:25 pm	Lunch					
IV	02:30 pm - 03:55 pm	Afternoon Session See be	elow.				
V	04:00 pm - 05:00 pm	Afternoon Session See be	elow.				
	05:00 pm - 05:25 pm	Break / light tea					
VI	05:30 pm - 06:45 pm	Games / Special Lecture	es				
	06:50 pm - 08:25 pm	Rest and Dinner					
VII	08:30 pm - 09:25 pm	Informal interactions (in	hostels)				

Sundays are off and Saturdays have the same schedule as above or have outings.

Afternoon Activities (Non-Daily)

The following five activities are scheduled at different times of the Induction Program, and are not held daily for everyone:

- 1. Familiarization to Dept./Branch & Innovations
- 2. Visits to Local Area
- 3. Lectures by Eminent People
- 4. Literary
- 5. Proficiency Modules

Here is the approximate activity schedule for the afternoons (may be changed to suit local needs):

	Activity		Session	<mark>i Remarks</mark>	
	Familiarization with Dept/Bra	inch			
	& Innovations	IV		For 3 days (Day 3 to 5)	
	Visits to Local Area	IV, V an	nd VI	for 3- days	
				For 3 days - interspersed (e.g., 3 Saturdays)	
	Lectures by Eminent People	IV		As scheduled - 3-5 lectures	
	Literary (Play / Book Reading	/ Lecture)	IV	For 3-5 days	
	Proficiency Modules	V		Daily, but only for those who need it	
	Closing Phase				
	Time	Activity			
	Last But One Day				
<mark>Closing Phase</mark> Time		Discussions and	d finaliz	ation of presentation within each group	
	02:00 am - 05:00 pm	Presentation by	y each g	roup in front of 4 other groups besides their	
		own (about 100	studen	ts)	
	Last Day				
	Whole day Examinations	(if any). May be e	expande	d to last 2 days, in case needed.	

II. SEMESTER WISE STRUCTURE OF CURRICULUM

[L= Lecture, T= Tutorials, P=Practical, C= Credits]

PROC	GRAM	YEAR					SEN	IESTER		
B.Tech	n. (CS)	Ι				Ι				
			Hours/Week				Score		End Enom	
Course Code	Description	Course Title	L	Т	Р	Credits	Internal	External	End Exam Duration	
BTCS101BST	Basic Science	Engineering Mathematics-I	3	1	0	4	30	70	3 Hrs	
BTCS102BST	Basic Science	Engineering Physics	3	1	0	4	30	70	3 Hrs	
BTCS101EST	Engineering Science	Basic Electrical Engineering	3	1	0	4	30	70	3 Hrs	
BTCS111EST	Engineering Science	Engineering Graphics & Design	1	1	4	4	30	70	3 Hrs	
BTCS150BSP	Basic Science	Engineering Physics Lab	0	0	4	2	50	50	3 Hrs	
BTCS150ESP	Engineering Science	Basic Electrical Engineering Lab	0	0	4	2	50	50	3 Hrs	
Total Credits per semester						20	60	00		
	Mandatory Induction Program- 3 Weeks Duration Note: End Semester Examinations of the subject(s) weighted more than 2 credits will be for three Hrs luration with maximum 100 marks score (30+70)									

PROGRAM		YEAR	YEAR					SEMESTER				
B.Tech	. (CS)	Ι				II						
			Hours/Week				Score		End			
Course Code	Description	Course Title	L	Т	Р	Credits	Internal	External	Exam Duration			
BTCS201BST	Basic Science	Engineering Mathematics – II	3	1	0	4	30	70	3 Hrs			
BTCS211BST	Basic Science	Engineering Chemistry	3	1	0	4	30	70	3 Hrs			
BTCS211EST	Engineering Science	Programming for Problem Solving	3	1	0	3	30	70	3 Hrs			
BTCS211HST	Humanities & Social Sciences including Management	English Communication	2	0	0	2	15	35	2 Hrs			
BTCS212EST	Engineering Science	Engineering Mechanics	3	1	0	4	30	70	3 Hrs			
BTCS260BSP	Basic Science	Engineering Chemistry Lab	0	0	4	2	50	50	3 Hrs			

BTCS260ESP	Engineering Science	Basic Programming Lab	0	0	4	2	50	50	3 Hrs
BTCS251ESP	Engineering Science	Engineering Workshop	0	0	6	3	50	50	3 Hrs
BTCS260HSP	Humanities & Social Sciences including Management	English Communication LAB	0	0	2	1	50	50	3 Hrs
	Tot					25	85	0	

PROC	RAM	YEAR					SEM	IESTER	
B.Tech	n. (CS)	II						III	
			Ηοι	ırs/'	Week			ore	End
Course Code	Description	Course Title	L	Т	Р	Credits	Internal	External	Exam Duration
BTCS311EST	Engineering Science Course	Analog Electronic Circuits	3	1	0	4	30	70	3 Hrs
BTCS311PCT	Professional Core Courses	Data structure & Algorithms	3	1	0	4	30	70	3 Hrs
BTCS312PCT	Professional Core Courses	Digital Electronics	3	1	0	4	30	70	3 Hrs
BTCS311BST	Basic Science course	Engineering Mathematics-III	3	1	0	4	30	70	3 Hrs
BTCS311HST	Humanities & Social Sciences including Management courses	Technology & Society	2	0	0	2	15	35	2 Hrs
BTCS360ESP	Engineering Science Course	Analog Electronic Circuits LAB	0	0	4	2	50	50	3 Hrs
BTCS360PCP	Professional Core Courses	Data structure & Algorithms LAB	0	0	4	2	50	50	3 Hrs
BTCS361PCP	Professional Core Courses	Digital Electronics LAB	0	0	4	2	50	50	3 Hrs
BTCS362PCP	Professional Core Courses	IT Workshop Python	0	0	4	2	50	50	3 Hrs
BTCS312HST	Mandatory Courses	Environmental Sciences	2	0	0	-	15	35	2 Hrs
	Total 26 900								

PROG	RAM	YEAR	2				SEM	ESTER	
B.Tech	n. (CS)	II						IV	
			Ηοι	ırs/V	Week			ore	End
Course Code	Description	Course Title	L	Т	Р	Credits	Internal	External	Exam Duration
BTCS402PCT	Professional Core Courses	Database Management Systems	3	1	0	4	30	70	3 Hrs
BTCS403PCT	Professional Core Courses	Operating Systems	3	1	0	4	30	70	3 Hrs
BTCS405PCT	Professional Core Courses	Object Oriented Programming	3	1	0	4	30	70	3 Hrs
BTCS406PCT	Professional Core Courses	Software Engineering	3	1	0	4	30	70	3 Hrs
BTCS407PCT	Professional Core Courses	Discrete Mathematics	3	1	0	4	30	70	3 Hrs
BTCS451PCP	Professional Core Courses	Database Management Systems LAB	0	0	4	2	50	50	3 Hrs
BTCS452PCP	Professional Core Courses	Operating Systems LAB	0	0	4	2	50	50	3 Hrs
BTCS453PCP	Professional Core Courses	Object Oriented Programming LAB	0	0	4	2	50	50	3 Hrs
	Total 26 800								

PROG	RAM	YEAR	2				SEM	IESTER	
B.Tech	n. (CS)	III					V		
			Ηοι	ırs/V	Week		Score		End
Course Code	Description	Course Title	L	Т	Р	Credits	Internal	External	Exam Duration
BTCS511PCT	Professional Core Courses	Computer Organization	3	1	0	4	30	70	3 Hrs
BTCS512PCT	Professional Core Courses	Formal Language & Automata Theory	3	1	0	4	30	70	3 Hrs
BTCS513PCT	Professional Core Courses	Design & Analysis of Algorithms	3	1	0	4	30	70	3 Hrs
BTCS511HST	Humanities & Social Sciences including	Organizational Behaviour	2	0	0	2	15	35	2 Hrs

	Management								
BTCS512HST	Humanities & Social Sciences including Management	History of Sciences & Technology in India	2	0	0	2	15	35	2 Hrs
BTCS51XPET	Professional Elective Courses	Elective-I	3	1	0	4	3	70	3 Hrs
BTCS560PCP	Professional Core Courses	Design & Analysis of Algorithms LAB	0	0	4	2	50	50	3 Hrs
BTCS511NCT	Mandatory Courses	Constitution of India	2	0	0	-	15	35	2 Hrs
	Tot					22	6 5	60	

PROGE	RAM	YEAR				SEMESTER			
B.Tech.	(CS)	III						VI	
			Ηοι	ırs/V	Week			ore	End
Course Code	Description	Course Title	L	Т	Р	Credits	Internal	External	Exam Duration
BTCS611PCT	Professio nal Core Courses	Compiler Design	3	1	0	4	30	70	3 Hrs
BTCS612PCT	Professio nal Core Courses	Computer Networks	3	1	0	4	30	70	3 Hrs
BTCS61XPET	Professio nal Elective Courses	Elective-II	3	1	0	4	30	70	3 Hrs
BTCS61XPET	Professio nal Elective Courses	Elective-III	3	1	0	4	30	70	3 Hrs
UGCS61XGET	Open Elective Courses	Open Elective-I	3	0	0	3	30	70	3 Hrs
BTCS660PCP	Professio nal Core Courses	Compiler Design LAB	0	0	4	2	50	50	3 Hrs
BTCS661PCP	Professio nal Core Courses	Computer Networks LAB	0	0	4	2	50	50	3 Hrs
BTCS662PCP	Project	Project-1	0	0	6	3	50	50	Viva- voce & Demon stratio n
		Total				26	80	00	

PROC	RAM	YEAR					SEM	IESTER	
B.Tech	n. (CS)	IV	IV					VII	
			Ηοι	ırs/V	Week		Score		End
Course Code	Description	Course Title	L	Т	Р	Credits	Internal	External	Exam Duration
BTCS71XPET	Professional Elective Courses	Elective-IV	3	1	0	4	30	70	3 Hrs
BTCS71XPET	Professional Elective Courses	Elective-V	3	1	0	4	30	70	3 Hrs
UGCS71XGET	Open Elective Courses	Open Elective-II	3	0	0	3	30	70	3 Hrs
BTCS760PCP	Project	Project-II	0	0	12	6	100	100	Viva- voce & Demo nstrati on
	Tota					17	50)0	

PROC	RAM	Y	EAR					SEM	IESTER	
B.Tech	n. (CS)	IV					VIII			
				Ηου	ırs/V	Week		Score		End
Course Code	Description	Course Title		L	Т	Р	Credits	Internal	External	Exam Duration
BTCS83XPET	Professional Elective Courses	Elective-VI		3	1	0	4	30	70	3 Hrs
BTCS83XPET	Professional Elective Courses	Elective-VII		3	1	0	4	30	70	3 Hrs
BTCS83XPET	Professional Elective Courses	Elective-VIII		3	1	0	4	30	70	3 Hrs
BTCS860PCP	Project	Project-III		0	0	12	6	100	100	Viva- voce & Demo nstrati on
	i i r						18	50)0	

	PROFESSIONAL COURSES -ELECTIVE-I IN FIFTH SEMESTER											
Course Code	Course Title	Hou L	rs/ T	Week P	Credits		Score					
BTCS511PET	Principles of Programming Languages	3	1	0	4	30	70	3 Hrs				
BTCS512PET	Parallel and Distributed Algorithms	3	1	0	4	30	70	3 Hrs				
BTCS513PET	Signal and Systems	3	1	0	4	30	70	3 Hrs				
BTCS514PET	Data Science	3	1	0	4	30	70	3 Hrs				

PROF	PROFESSIONAL COURSES -ELECTIVE-II & ELECTIVE-III FOR SIXTH SEMESTER											
_		Hou	rs/V				ore	End				
Course Code	Course Title	L	Т	Р	Credits	Internal	External	Exam Duration				
BTCS611PET	Data Mining and Data Warehousing	3	1	0	4	30	70	3 Hrs				
BTCS612PET	Python Programming	3	1	0	4	30	70	3 Hrs				
BTCS613PET	Advanced Computer Architecture	3	1	0	4	30	70	3 Hrs				
BTCS614PET	Distributed Systems	3	1	0	4	30	70	3 Hrs				
BTCS615PET	Computer Graphics	3	1	0	4	30	70	3 Hrs				
BTCS616PET	Advanced Operating Systems	3	1	0	4	30	70	3 Hrs				
BTCS617PET	Embedded Systems	3	1	0	4	30	70	3 Hrs				

PROFE	PROFESSIONAL COURSES -ELECTIVE-IV & ELECTIVE-V FOR SEVENTH SEMESTER											
		Ηοι	ırs/\	Week		Score		End				
Course Code	Course Title	L	Т	Р	Credits	Internal	External	Exam Duration				
BTCS711PET	Artificial Intelligence	3	1	0	4	30	70	3 Hrs				
BTCS712PET	Block Chain Technology	3	1	0	4	30	70	3 Hrs				
BTCS713PET	Real Time System	3	1	0	4	30	70	3 Hrs				
BTCS714PET	Ad-Hoc and Sensor Network	3	1	0	4	30	70	3 Hrs				
BTCS715PET	Internet-of-Things	3	1	0	4	30	70	3 Hrs				

I	PROFESSIONAL COURSES -ELECTIVE-VI, VII FOR EIGTH SEMESTER											
		Ho	ırs/'	Week			ore	End				
Course Code	Course Title	L	Т	Р	Credits	Internal	External	Exam Duration				
BTCS831PET	Image Processing	3	1	0	4	30	70	3 Hrs				
BTCS832PET	Data Analytics	3	1	0	4	30	70	3 Hrs				
BTCS833PET	Neural Networks and Deep Learning	3	1	0	4	30	70	3 Hrs				
BTCS834PET	Cloud Computing	3	1	0	4	30	70	3 Hrs				
BTCS835PET	Human Computer Interaction	3	1	0	4	30	70	3 Hrs				
BTCS836PET	Web and Internet Technology	3	1	0	4	30	70	3 Hrs				
BTCS837PET	Cryptography and Network Security	3	1	0	4	30	70	3 Hrs				
BTCS838PET	Soft Computing	3	1	0	4	30	70	3 Hrs				
BTCS839PET	Speech and Natural Language Processing	3	1	0	4	30	70	3 Hrs				
BTCS840PET	Machine Learning	3	1	0	4	30	70	3 Hrs				

OPEN ELECTIVE-I:

Γ

UGCS615GET

A Student need to opt any one subject from the following open electives to be offered by the other Departments									
		Ηοι	ırs/V	Week			ore	End	
Course Code	Course Title	L	Т	Р	Credits	Internal	External	Exam Duration	
UGCS611GET	Soft Skill and Interpersonal Communication	3	0	0	3	30	70	3 Hrs	
UGCS612GET	Human Resource Development and Organizational Behavior	3	0	0	3	30	70	3 Hrs	
UGCS613GET	Cyber Law and Cyber Security	3	0	0	3	30	70	3 Hrs	
UGCS614GET	Comparative Study of Modern Indian Languages	3	0	0	3	30	70	3 Hrs	

OPEN ELECTIVE-II:

3

0

0

Biology (Basic Science Course)

3

30

70

3 Hrs

A Student need to opt any one subject from the following open electives to be offered by the other Departments

		Hours/Week					Score		
Course Code	Course Title Intellectual Property Rights		Т	Р	Credits	Internal	External	Exam	
								Duration	
UGCS711GET			0	0	3	30	70	3 Hrs	
UGCS712GET	History of Science	3	0	0	3	30	70	3 Hrs	
UGCS713GET	Values & Ethics	3	0	0	3	30	70	3 Hrs	
UGCS714GET	Economic Policies in India	3	0	0	3	30	70	3 Hrs	

				Course					ture			
BTCS101					athemati			L T		Ser	nester: I	
Version: 1.2					oval: 16	th BoS 17	7-11-2022		•	1 0		
	Scheme			n			S	cheme o				
	Periods) Hrs.			Maximum Score : 100						
Periods	/ Week	: 4				Internal Evaluation : 30						
	Credits : 4 End Sem							nester	: 7	70		
Instructio	n Mode									iration	: 3	3 Hrs.
Prerequisit	e(s): Basi	c know	ledge o	f Mathe	matics							
Course Obj												
							to variou	ıs engine	ering p	roblems		
2. To prov												
3. To acqu												
4. To impa		oncept	of parti	al deriv	atives c	of first an	d higher	orders i	n the fie	eld of er	nginee	ering and
technol												
Course Out	comes (C	CO):										
COs No.					Staten	nent						Program
											tcom	es (POs)
CO ₁	115			0			notions	of curv	ature to		PO ₁ ,	PO ₂
						eering p					- 01,	
CO_2							algebra			r	PO _{3,}	PO ₅
							and orth		ation.	_		
CO ₃							gher orde			_	PC	4
CO ₄				applicat	ions wit	th basic ι	inderstar	nding of I	Beta and	1	PO 3, 1	PO12
	Gamma											
PO ₁ - Engine												
investigation												
sustainability PO ₁₂ - Life-lor			- maivia	ual of tea	annwork	, PO 10- CO	mmumcat	1011, PO 11-	Project I	nanagen	ient ar	iu imance,
		0	anning	of cour	se outc	omes wi	th progra	moutco	mes			
Course												
Outcomes	DO				50							
	PO ₁	PO_2	PO ₃	PO ₄	PO ₅	PO ₆	PO_7	PO ₈	PO ₉	PO ₁₀	PO	1 PO 12
			PO ₃	PO ₄	PO ₅	PO ₆	PO ₇	PO ₈	PO ₉	PO ₁₀	PO	11 PO 12
CO ₁	2	PO ₂ 3				PO ₆	PO ₇	PO ₈	PO ₉	PO ₁₀	PO	PO ₁₂
CO ₁ CO ₂			PO ₃		2	PO ₆	PO ₇		PO ₉	PO ₁₀		PO ₁₂
CO ₁ CO ₂ CO ₃			2	PO ₄		PO ₆	PO ₇		PO ₉			
CO ₁ CO ₂			2	2	2				PO ₉			PO ₁₂
CO ₁ CO ₂ CO ₃ CO ₄	2		2	2	2		PO7		PO ₉			
CO ₁ CO ₂ CO ₃	2	3	2 2 1-	2 Reason	2 able; 2 -	- Signific	cant; 3 – S	Strong				2
CO ₁ CO ₂ CO ₃ CO ₄	2	3 Matri	2 2 1- ces: N	2 Reason	2 able; 2 -	- Signifi tors: ac	c ant; 3 – S	Strong and sc	alar m	ultiplic	ation,	2 matrix
CO ₁ CO ₂ CO ₃ CO ₄	2 ontents:	3 Matri multip	2 2 1- ces: Molication	2 Reason Matrices n; Linea	2 able; 2 -	- Signifi tors: ac ms of eq	c ant; 3 – s Idition uations, 1	Strong and sc inear Inc	alar m depende	aultiplic ence, ra	ation,	2 matrix a matrix,
CO ₁ CO ₂ CO ₃ CO ₄ Detailed Co	2 ontents:	3 Matri multip detern	2 2 1 - ces: M plication minants	2 Reason Matrices n; Linea s, Cram	2 able; 2 - s, vect ar system er's Ru	- Signific tors: ac ms of eq le, invers	cant; 3 – S Idition uations, 1 se of a n	Strong and sc inear Inc natrix, C	alar m depende	ultiplica ence, ra minatic	ation, nk of on and	2 matrix a matrix, 1 Gauss-
CO ₁ CO ₂ CO ₃ CO ₄ Detailed Co	2 ontents:	3 Matri multip detern Jordan	2 2 1 - ces: M blication minants n elimin	2 Reason Matrices n; Linea s, Cram nation. (2 able; 2 - s, vect er's Ru Cayley-1	- Signific tors: ac ms of eq le, invers Hamilton	cant; 3 – S Idition uations, 1 se of a n 's theore	Strong and sc inear Inc natrix, C m (witho	alar m depende auss eli out proo	ultiplic. ence, ra minatic f) and it	ation, nk of on and s app	2 matrix a matrix, d Gauss- lications
CO ₁ CO ₂ CO ₃ CO ₄ Detailed Co	ntents:	3 Matri multip detern Jordan Vecto	2 2 1- ces: M blication minants n elimir r space	2 Reason Matrices n; Linea s, Cram nation. (s: Vecto	2 able; 2 - s, vect r syster er's Ru Cayley-1 or Space	- Signific tors: ac ms of eq le, invers Hamilton e, linear o	cant; 3 – S Idition uations, 1 se of a n i's theore lepender	Strong and sc inear Inc natrix, C m (withc ace of vec	alar m depende auss eli out proo ctors, ba	ultiplic ence, ra minatic f) and it asis, dim	ation, nk of on and s app nensio	2 matrix, a matrix, d Gauss- lications n; Linear
CO ₁ CO ₂ CO ₃ CO ₄ Detailed Co	ntents:	3 Matri multip detern Jordan Vecto transf	2 2 1 - ces: M blication minants n elimir r space Cormatio	2 Reason Matrices n; Linea s, Cram nation. C s: Vecto ons (ma	2 able; 2 - s, vect rr syster er's Ru Cayley-1 or Space ps), ran	- Signific tors: ac ms of eq le, invers Hamilton e, linear o ge and k	cant; 3 – s Idition uations, 1 se of a n i's theore lepender cernel of	Strong and sc inear Ind natrix, G m (withous ace of ver a linear :	alar m depende auss eli out proo ctors, ba map, rai	ultiplic ence, ra minatic f) and it sis, dim hk and 1	ation, nk of on and s app nensio nullity	2 matrix a matrix, d Gauss- lications n; Linear r, Inverse
CO ₁ CO ₂ CO ₃ CO ₄ Detailed Co	ntents:	3 Matri multip detern Jordan Vecto transf of a lin	2 2 1 – ces: M plication minants n elimin r space Formationear tra	2 Reason Matrices n; Linea s, Cram nation. C s: Vecto ons (ma nsform	2 able; 2 - s, vector systemer's Ru Cayley-Dor Space ps), ran ation, r.	- Signific tors: ac ms of eq le, invers Hamilton e, linear o ge and k ank-nulli	cant; 3 – s Idition uations, 1 se of a n i's theore lepender cernel of	Strong and sc inear Inc natrix, C m (with ace of vec a linear :	alar m depende auss eli out proo ctors, ba map, rai	ultiplic ence, ra minatic f) and it sis, dim hk and 1	ation, nk of on and s app nensio nullity	2 matrix a matrix, d Gauss- lications n; Linear r, Inverse
CO ₁ CO ₂ CO ₃ CO ₄ Detailed Co	ntents:	3 Matri multip detern Jordan Vecto transf of a lin associ	2 2 1 - ces: M plication minants n elimin r space Formation near tra- iated wi	2 Reason Matrices n; Linea s, Cram aation. C s: Vecto ons (ma insform ith a lin	2 able; 2 - s, vector system cayley-l or Space ps), ran ation, r ear map	- Signific tors: ac ms of eq le, invers Hamilton e, linear o ge and k ank-nulli o.	cant; 3 – 9 Idition uations, 1 se of a n 's theore depender ternel of ty theore	and sc inear Inc natrix, C m (withous a linear em, comp	alar m depende auss eli out proo ctors, ba map, ran position	ultiplicence, ra aminatic f) and it asis, dim asis, dim asis, dim of linea	ation, nk of on and s app nension nullity r map	2 matrix a matrix, d Gauss- lications n; Linear r, Inverse s, Matrix
CO1 CO2 CO3 CO4 Detailed Co Unit:	2 mtents: 1 2	3 Matri multip detern Jordan Vecto transf of a lin associ Vecto	2 1 – ces: M blication minants n elimir r space formation near tra iated wi r space	2 Reason Matrices n; Linea s, Cram nation. (s: Vecto ons (ma unsform ith a lin ces: Eiş	2 able; 2 - s, vector systemer's Ru Cayley-1 or Space ps), ran ation, r ear map genvalu	- Signific tors: ac ms of eq le, invers Hamilton e, linear o ge and k ank-nulli o. es, eige	cant; 3 – 9 Idition uations, 1 se of a n i's theore depender cernel of ity theore nvectors	Strong and sc inear Ind natrix, C m (withous a linear is em, comp , symm	alar m depende auss eli out proo ctors, ba map, ran position etric, s	ultiplice ence, ra minatic f) and it asis, dim asis, dim ak and a of linea	ation, nk of on and s app nensio nullity r map	2 matrix a matrix, d Gauss- lications n; Linear r, Inverse s, Matrix ric, and
CO ₁ CO ₂ CO ₃ CO ₄ Detailed Co	2 mtents: 1 2	3 Matri multip detern Jordar Vecto transf of a lin associ Vecto orthop	2 1 - ces: M blication minants n elimin r space formation near tra iated wi r space gonal M	2 Reason Matrices n; Linea s, Cram nation. (s: Vecto ons (ma unsform ith a lin- tes: Eig Matrices	2 able; 2 - s, vector systemer's Ru Cayley-1 or Space ps), ran ation, r ear map genvalu s, eigen	- Signific tors: ac ms of eq le, invers Hamilton e, linear o ge and k ank-nulli o. es, eige	cant; 3 – 9 Idition uations, 1 se of a n i's theore depender cernel of ity theore nvectors	Strong and sc inear Ind natrix, C m (withous a linear is em, comp , symm	alar m depende auss eli out proo ctors, ba map, ran position etric, s	ultiplice ence, ra minatic f) and it asis, dim asis, dim ak and a of linea	ation, nk of on and s app nensio nullity r map	2 matrix a matrix, d Gauss- lications n; Linear r, Inverse s, Matrix ric, and
CO1 CO2 CO3 CO4 Detailed Co Unit:	2 mtents: 1 2	3 Matri multip detern Jordan Vecto transf of a lin associ Vecto orthop Schm	2 1 - ces: M blication minants n elimin r space formation near tra iated wit r space gonal M idt orth	2 Reason Matrices n; Linea s, Cram nation. (s: Vecto ons (ma unsform ith a lin- ces: Eig Matrices ogonali	2 able; 2 - s, vect rr syster er's Ru Cayley-l or Space ps), ran ation, r ear map genvalu s, eigen zation.	- Signific tors: ac ms of eq le, invers Hamilton e, linear o ge and k ank-nulli o. es, eige bases. I	cant; 3 – S Idition uations, 1 se of a n i's theore lepender ernel of i ty theore nvectors. Diagonali	Strong and sc inear Inc natrix, C m (withous ce of ver a linear : em, comp , symm zation; 1	alar m depende auss eli out proo ctors, ba map, ran position etric, s inner pr	nultiplice ence, ra minatic f) and it siss, dim hk and n of linea kew-sy oduct	ation, nk of on and s app nensio nullity r map mmet space	matrix, a matrix, d Gauss- lications n; Linear r, Inverse s, Matrix ric, and s, Gram-
CO1 CO2 CO3 CO4 Detailed Co Unit:	2 mtents: 1 2	3 Matri multip detern Jordan Vecto transf of a lin associ Vecto ortho Schmi Calcu	2 2 1 – ces: M blication minants n elimin r space formation near tra iated wi r space gonal M idt orth lus- I:	2 Reason Matrices n; Linea s, Cram nation. C s: Vecto ons (ma unsform ith a lin- ces: Eiş Matrices ogonali Mean v	2 able; 2 - s, vect r syster er's Ru Cayley-1 or Space ps), ran ation, r ear map genvalu s, eigen zation. r alue th	- Signific tors: ac ms of eq le, invers Hamilton e, linear o ge and k ank-nulli b. es, eige bases. 1 eorems:	cant; 3 – 9 Idition uations, 1 se of a n i's theore lepender cernel of ity theore nvectors Diagonali Rolle's n	Strong and sc inear Ind natrix, C m (withous a linear i em, comp , symm zation; I nean value	alar m depende auss eli out proo ctors, ba map, ran cosition etric, s inner pr ue theor	ultiplic ence, ra minatic f) and it sis, dim hk and n of linea kew-sy roduct	ation, nk of on and s app nension nullity r map mmet space	matrix a matrix, d Gauss- lications n; Linear c, Inverse s, Matrix ric, and s, Gram- e's mean
CO1 CO2 CO3 CO4 Detailed Co Unit:	2 mtents: 1 2	3 Matri multip detern Jordan Vecto transf of a lin associ Vecto ortho Schm Calcu value	2 2 1 – ces: M blication minants n elimin r space formation near tra iated wi r space gonal M idt orth lus- I: theore	2 Reason Matrices n; Linea s, Cram nation. C s: Vecto ons (ma unsform ith a lin- tes: Eig Matrices ogonali Mean v m and	2 able; 2 - s, vect r syster er's Ru Cayley-1 or Space ps), ran ation, r ear map genvalu s, eigen zation. r alue th	- Signific tors: ac ms of eq le, invers Hamilton e, linear o ge and k ank-nulli b. es, eige bases. 1 eorems:	cant; 3 – 9 Idition uations, 1 se of a n i's theore lepender cernel of ity theore nvectors Diagonali Rolle's n	Strong and sc inear Ind natrix, C m (withous a linear i em, comp , symm zation; I nean value	alar m depende auss eli out proo ctors, ba map, ran cosition etric, s inner pr ue theor	ultiplic ence, ra minatic f) and it sis, dim hk and n of linea kew-sy roduct	ation, nk of on and s app nension nullity r map mmet space	matrix a matrix, d Gauss- lications n; Linear c, Inverse s, Matrix ric, and s, Gram- e's mean
CO1 CO2 CO3 CO4 Detailed Co Unit:	2 mtents: 1 2 3	3 Matri multip detern Jordan Vecto transf of a lin associ Vecto orthop Schmi Calcu value proble	2 2 1 – ces: M plication minants n elimin r space Formation near tra iated with r space gonal M idt orth lus- I : theore ems on	2 Reason Matrices n; Linea s, Cram nation. (s: Vecto ons (ma insform ith a lin- ith a lin- ith a lin- ces: Eig Matrices ogonali Mean v m and it.	2 able; 2 - s, vect r syster cr's Ru Cayley-1 or Space ps), ran ation, r ear map genvalu s, eigen zation. r alue th Cauchy	- Signific tors: ac ms of eq le, invers Hamilton e, linear o ge and k ank-nulli b. es, eige bases. I eorems: 's mean	cant; 3 – 9 Idition uations, 1 se of a n i's theore depender ty theore nvectors. Diagonali Rolle's n value th	Strong and sc inear Ind natrix, C m (withe a linear i em, comp , symm zation; I nean value eorem (a	alar m depende auss eli out proo ctors, ba map, ran position etric, s inner pr ue theor All Theo	ultiplice ence, ra minatice f) and it asis, dim hk and n of linea kew-sy roduct s rem, La orems v	ation, nk of on and s app nension nullity r map mmet space grang vithou	matrix a matrix, d Gauss- lications n; Linear r, Inverse s, Matrix ric, and s, Gram- e's mean tt proof);
CO1 CO2 CO3 CO4 Detailed Co Unit: Unit:	2 mtents: 1 2 3	3 Matri multip detern Jordan Vecto transf of a lin associ Vecto orthop Schm Calcu value proble Succe	2 2 1 - ces: M plication minants n elimin r space formation near tra iated with r space gonal M idt orth lus- I: theore ems on ssive C	2 Reason Matrices n; Linea s, Cram nation. (s: Vecto ons (ma nsform ith a lin ces: Eig Matrices ogonali Mean v m and it. lifferen	2 able; 2 - s, vectar system cayley-l or Space ps), ran ation, ran ation, ran genvalu s, eigen zation. ralue th Cauchy tiation	- Signific tors: ac ms of eq le, invers Hamilton e, linear o ge and k ank-nulli b. es, eige bases. I eorems: 's mean	cant; 3 – 9 Idition uations, 1 se of a n i's theore depender cernel of ty theore nivectors. Diagonali Rolle's n value th	Strong and sc inear Ind natrix, C m (withous a linear se m, comp , symm zation; I nean value eorem (a s; Leibn	alar m depende auss eli out proo ctors, ba map, ran position etric, s inner pr ue theo All Theo itz's the	ultiplica ence, ra iminatio f) and it asis, dim hk and r of linea kew-sy roduct s rem, La prems v corem;	ation, nk of on and s app dension nullity r map mmet space grang vithou Expar	a matrix a matrix, d Gauss- lications n; Linear r, Inverse s, Matrix ric, and s, Gram- e's mean at proof); nsions of
CO1 CO2 CO3 CO4 Detailed Co Unit: Unit:	2 mtents: 1 2 3	3 Matri multip detern Jordan Vecto transf of a lin associ Vecto orthog Schm Calcu value proble Succe functi	2 2 1 - ces: M plication minants n elimin r space formation near tra iated wi r space gonal M idt orth lus- I: theore ems on ssive c ons: , f	2 Reason Matrices n; Linea s, Cram ation. (ons (ma nsform ith a lin ces: Eiş Matrices ogonali Mean v m and it. lifferen Faylor's	2 able; 2 - s, vector system cayley-loor Space ps), ran ation, r. ear map genvalu s, eigen zation. ralue th Cauchy tiation and M	- Signific tors: ac ms of eq le, invers Hamilton e, linear o ge and k ank-nulli o. es, eige bases. I eorems: 's mean aclaurin'i	cant; 3 – 9 Idition uations, 1 se of a n i's theore depender ernel of ty theore nvectors. Diagonali Rolle's n value th rd result: s series v	Strong and sc inear Ind natrix, C m (withous ce of ver a linear i em, comp symm zation; I nean value eorem (a s; Leibn vith rem	alar m depende auss eli out proo ctors, ba map, ran position etric, s inner pr ue theor All Theo ainders	ultiplica ence, ra iminatio f) and it asis, dim hk and r of linea kew-sy roduct s rem, La prems v corem;	ation, nk of on and s app dension nullity r map mmet space grang vithou Expar	a matrix a matrix, d Gauss- lications n; Linear r, Inverse s, Matrix ric, and s, Gram- e's mean at proof); asions of
CO1 CO2 CO3 CO4 Detailed Co Unit: Unit:	2 mtents: 1 2 3	3 Matri multip detern Jordan Vecto transf of a lin associ Vecto ortho Schmi Calcu value proble Succe functi proof	2 2 1 - ces: M blication minants n elimin r space formation near tra- iated wi r space gonal M idt orth lus- I: theore ems on essive c ons: , ' ; Maxim	2 Reason Matrices n; Linea s, Cram ation. (ons (ma nsform ith a lin ces: Eiş Matrices ogonali Mean v m and it. lifferen Faylor's	2 able; 2 - s, vector system cayley-loor Space ps), ran ation, r. ear map genvalu s, eigen zation. ralue th Cauchy tiation and M	- Signific tors: ac ms of eq le, invers Hamilton e, linear o ge and k ank-nulli o. es, eige bases. I eorems: 's mean aclaurin'i	cant; 3 – 9 Idition uations, 1 se of a n i's theore depender cernel of ty theore nivectors. Diagonali Rolle's n value th	Strong and sc inear Ind natrix, C m (withous ce of ver a linear i em, comp symm zation; I nean value eorem (a s; Leibn vith rem	alar m depende auss eli out proo ctors, ba map, ran position etric, s inner pr ue theor All Theo ainders	ultiplica ence, ra iminatio f) and it asis, dim hk and r of linea kew-sy roduct s rem, La prems v corem;	ation, nk of on and s app dension nullity r map mmet space grang vithou Expar	a matrix a matrix, d Gauss- lications n; Linear r, Inverse s, Matrix ric, and s, Gram- e's mean tt proof);
CO1 CO2 CO3 CO4 Detailed Co Unit: Unit: Unit:	2 mtents: 1 2 3 4	3 Matri multip detern Jordar Vecto transf of a lin associ Vecto ortho Schm Calcu value proble Succe functi proof, Calcu	2 1 - ces: M blication minants n elimin r space formation near tra- iated wi r space formation near tra- iated wi r space formation r space gonal M idt orth lus- I : theore ems on essive c ons: , '); Maxin lus-II :	2 Reason Matrices n; Linea s, Cram nation. (s: Vecto ons (ma unsform ith a lin- ces: Eig Matrices ogonali Mean v m and it. Hifferen Taylor's na and n	2 able; 2 - s, vector systemer's Ru Cayley-J or Space ps), ran ation, r ear map genvalu s, eigen zation. ralue th Cauchy tiation and M minima	- Signific tors: ac ms of eq le, invers Hamilton e, linear o ge and k ank-nulli b. es, eige bases. 1 eorems: 's mean : standar aclaurin's for funct	ant; 3 – 9 Idition uations, 1 se of a n i's theore lepender ternel of ty theore nvectors. Diagonali Rolle's n value th rd result: s series v tion of on	Strong and sc inear Inc natrix, C m (with ce of vec a linear i em, comp , symm zation; I nean value eorem (s; Leibn vith rem e variab	alar m depende auss eli out proo ctors, ba map, ran cosition etric, s inner pr ue theo All Theo itz's the ainders le.	ultiplic. ence, ra minatic f) and it ssis, dim hk and r of linea kew-sy roduct s rem, La orems v eorem; (All The	ation, nk of on and s app nensio nullity r map mmet spaces grang vithou Expar orems	2 matrix a matrix, d Gauss- lications n; Linear r, Inverse s, Matrix ric, and s, Gram- e's mean tt proof); asions of s without
CO1 CO2 CO3 CO4 Detailed Co Unit: Unit:	2 mtents: 1 2 3 4	3 Matri multip detern Jordar Vecto ortasf of a lin associ Vecto orthop Schm Calcu value proble Succe functi proof Calcu Partia	2 1 - ces: M blication minants n elimir r space ormation near tra iated wi r space gonal M idt orth lus- I: theore ems on ssive C ons: , '); Maxin lus-II: al Differ	2 Reason Matrices n; Linea s, Cram nation. (s: Vecto ons (ma unsform ith a lin- res: Eig Matrices ogonali Mean v m and it. lifferen Taylor's na and n rentiati	2 able; 2 - s, vector systemer's Ru Cayley	- Signific tors: ac ms of eq le, invers Hamilton e, linear o ge and k ank-nulli b. es, eige bases. I eorems: 's mean aclaurin's for funct tial deriv	ant; 3 – 9 Idition uations, 1 se of a n i's theore lepender ternel of ty theore nvectors. Diagonali Rolle's n value th rd result: s series v tion of on	Strong and sc inear Inc natrix, C m (withc ice of vec a linear i em, comp , symm zation; I nean value eorem (a s; Leibn vith rem e variab first and	alar m depende auss eli out proo ctors, ba map, ran position etric, s inner pr ue theor All Theor ainders le. higher	ultiplice ence, ra iminatic f) and it issis, dim hk and n of linea kew-sy roduct s rem, La orems v corem; (All The orders,	ation, nk of on and s app nensio nullity r map mmet spaces grang vithou Expar orems	a matrix a matrix, d Gauss- lications n; Linear r, Inverse s, Matrix ric, and s, Gram- e's mean at proof); asions of

	Evaluation of definite and improper integrals; Beta and Gamma functions and their properties; Applications of definite integrals to evaluate surface areas and volumes
	of revolutions.
	Multiple Integrals and Their Applications: Double integrals and their evaluation;
	Change of order for integration; Double integrals in polar coordinates; Triple
	integrals;
	Application of multiple integrals to find area, volume, surface area
Exa	mination and Evaluation Pattern: It include both internal evaluation (30 marks) comprising two class
sess	sional exams/ assignments/ quiz/ seminar presentation etc. and external evaluation (70 marks)
whi	ch is mainly end semester examination.
Tex	t Books:
1	G.B. Thomas and R.L. Finney, Calculus and Analytic geometry, 9th Edition, Pearson, Reprint, 2002.
2	Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
3	D. Poole, Linear Algebra: A Modern Introduction, 2nd Edition, Brooks/Cole, 2005.
4	Veerarajan T., Engineering Mathematics for first year, Tata McGraw-Hill, New Delhi, 2008.
5	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 35th Edition, 2010.
Refe	erence Books:
1	H. Anton, C. Rorres, Elementary Linear Algebra with Supplemental Applications, 11th Edition, Wiley
	Student Edition, New Delhi (2011)
2	N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint,
	2008.
3	M. D. Weir, J. Hass, Thomas' Calculus,12th Edition, Pearson India Education Services Pvt Ltd., New
	Delhi (2016).
4	V. Krishnamurthy, V.P. Mainra and J.L. Arora, An introduction to Linear Algebra, Affiliated East–West
	press, Reprint 2005.

Course C				Course				+ T	ture				
BTCS102					g Physics				Г Р	S	emes	ster: I	
Version: 1.2					oval: 16	th BoS 1	7-11-2022		U U	1 0			
	Scheme	r 1		n			S	cheme o				10.0	
	Periods		0 Hrs.					Maximum Score : 100 Internal Evaluation : 30					
Periods/Week : 4 Credits : 4											30 70		
											:	70 3 H	ra
Instruction Mode : Lecture Exam Duration Prerequisite(s): Basic knowledge of Physics									nation	•	эп	18.	
Course Obje	<u>, , ,</u>		leuge o	i r iiysic	<i>.</i> 3								
and tec 2. To dem 3. To learn Newtor	hnology. onstrate ing basic i's rings, erstand t	variou proper interfe	s scient ties and erence in	ific prin charact n thin fi	ciples, eristics lms.	engineer of light, o	ith adapta ring meth double sli nd conser	ods and it and tri	technol iple slit	ogical d	leve	lopm	
COs No.	comes (c	.0,.			Stater	nent				Ma	ppe	d Pro	ogram
005110					Stater								(POs)
CO ₁	Unders and app			's Law a	nd the	principle	es of laser	rs, types	of lasers			PO ₁	<u> </u>
CO ₂	Apply permea					propertie	es of ma	aterials	such a	ıs,	PC	D1, PO	2
CO ₃	Analyze	some	of the b	asic law	vs relate	ed to qua f materia	ntum me ls.	chanics	as well a	as	PO ₂ ,	PO ₃ , 1	PO ₄
CO ₄	0			<u> </u>			chanics of	alculatio	ons.		PC	D2, PO	3
PO ₁₂ - Life-lor Course	ng Learnir PO ₁		fapping PO₃	of cour	se outc PO5	omes wi	th progra PO 7	m outco PO ₈	mes PO ₉	PO ₁₀	P	O ₁₁	PO ₁₂
Outcomes				1			1			10	_	- 11	12
CO1 CO2	3	1											
CO ₂	2	1	2	2									
CO ₄		2	2										
004				Reason	able: 2 ·	– Sianifi	cant; 3 – 9	Strona			1		
Detailed Co	ntents:		-			2091090		ourong					
Unit:		Fraur and r appli Polar	nhofer a nultiple cations. isation:	nd Fres slits; di Introd	nel diffi iffractio uction,	raction, l on gratin polarisa	erence an Fraunhofe g, charac ation by ar and elli	er diffrac teristics reflecti	of diffration, pol	single s action g larisatio	lit, d grati on b	loubl ng ai oy de	e slit, nd its ouble
Unit: 2refraction, scattering of light, circular and elliptical polarisation, optical activityUnit: 2Fibre Optics: Introduction, optical fibre as a dielectric wave guide: total inter reflection, numerical aperture and various fibre parameters, losses associated optical fibres, step and graded index fibres, application of optical fibres. Lasers: Introduction to interaction of radiation with matter, principles and wor of laser: population inversion, pumping, various modes, threshold popula inversion, types of laser: solid state, semiconductor, gas; application of lasers.							ternal d with orking						
Unit:	3	Elect equat Polar inter	romagne ion, lav isation, nal fields	etism : ws of permea s in a so	Laws magnet bility a lid, Cla	of electr tism. Ar nd diele usius-Me	rostatics, npere's F ctric cons ossotti eq	electric Faraday's stant, po uation, a	curren laws. lar and applicati	nt and Maxwe non-po ons of c	the ell's plar liele	cont equa diele ctric	ations. ctrics, s.
Unit:	4	Magr class hyste	etic Pro fication resis, a	operties of ma pplicati	s of Ma agnetic ons. Int	terials :1 materia troductio	Magnetisa als, ferro on to qua pt, photoe	ation, pe magneti antum p	ermeabil sm, ma hysics,	ity and ignetic black t	sus dor ody	cept nains radi	ibility, s and

	Unit: 5	Quantum Mechanics: de Broglie hypothesis, wave-particle duality, Born's interpretation of the wave function, verification of matter waves, uncertainty principle, Schrodinger wave equation, particle in box, quantum harmonic oscillator, hydrogen atom.							
	Examination and Evaluation Pattern: It include both internal evaluation (30 marks) comprising two class								
		signments/quiz/seminar presentation etc. and external evaluation (70 marks) which							
is m	ainly end semest	ter examination.							
Text	t Books:								
1	Beiser : Modern	n Physics							
2	Mani and Damask : Modern Physics								
Refe	Reference Books:								
1	Resnick and Halliday : Physics								
2	M. Ratner & D.	Ratner (Pearson Ed.): Nanotechnology							
3	A.J. Decker (Ma	acmillan): Solid State Physics							

ETCSI01EST Basic Electrical Engineering L T P Semester: 1 Version: 1.2 Scheme of Instruction Scheme of Examination Scheme of Examination Semester: 1 No. of Periods, Veck 1: 4 Initian Score 1: 100 Periods, Veck 1: 4 Initian Score 1: 31 1: 1: 100 Periods, Veck 1: 4 Initian Score 1: 31 1: 1: 100 Instruction Mode 1: Lecture Eand AC electric circuits and magnetic circuits. 3: 1		a 1				~	m' / 1			-			
Version: 1.2 Date of Approval: 16th BoS 17-11-2022 3 1 0 Scheme of Instruction Scheme of Examination Maximum Score 100 Periods/Weck : 4 Internal Evaluation 30 Credits : 4 Internal Evaluation 31 Prerequisite(s): Basic Knowledge of Mathematics and Physics Exam Duration 31 31 Course Objectives: 1 To provide knowledge about the basic DC and AC electric circuits and magnetic circuits. 3 To grain knowledge about the fundamentals of wiring and earthling. Course Outcomes (CO): Course Outcomes (CO): Statement Mapped Program Outcomes (POs) Con Understanding of the basic knowledge of electrical quantities such as current, voltage, power, energy and frequency to understand the impact of technology in a global. Po,													
Scheme of Instruction Scheme of Xumination No. of Periods/ Week i 00 Periods/Week i 0 Instruction Mode i 130 Credits i 4 Internal Evaluation i 30 Credits i 4 Exam Duration i 30 Credits i 4 Exam Duration i 30 Credits i 4 Exam Duration i 30 Course Objectives: - - To inpact of echonology in a globa - - 70 provide knowledge about the fundamentals of wiring and earthling. Course Ocide Outcomes (POs) Course Outcomes (CO: CO Understanding of the basic knowledge of electrical quantities such as current, voltage, power, energy and frequency to understand the impact of technology in a global. Pot Pot, Pot							0	0				Seme	ster: 1
No. of Periods / Week i 100 Periods / Week i 4 Internal Evaluation i 30 Credits i 4 End Semester i 70 Instruction Mode i Lecture Exam Duration i 31 Irs. Prerequisite(s): Basic knowledge of Mathematics and Physics Course Objectives: i 70 introduce fundamental concepts and analysis techniques in electrical engineering. 1 To privide knowledge about the basic DC and AC electric circuits and magnetic circuits. 3. To inpart the concepts of generators, motors, transformers and their applications. 4. To gain knowledge about the fundamentals of wiring and earthling. Course Outcomes (CO): COs Understanding of the basic knowledge of electrical quantities such as current, voltage, power, energy and frequency to understand the impact of technology in a global. P0,	version: 1.2		ofIngt			oval: 16	th BOS L		ahamaa		-		
Periods/Weekl i 4 Internal Evaluation i 30 Credits i 4 End Semester i 70 Instruction Mode i Lecture Exam Duration i 3 Hrs. Prerequisite(5): Basic knowledge of Mathematics and Physics Course Objectives: instruction Mode i 3 Hrs. 2. To provide knowledge about the basic DC and AC electric circuits and magnetic circuits. 3. To impart the concepts of generators, motors, transformers and their applications. 4. To gain knowledge about the fundamentals of wring and earthling. COs Corresource Ourcomes (CO): Statement Mapped Program Outcomes (POs) CO Understanding of the basic knowledge of electrical quantities such as current, voltage, power, energy and frequency to understand the impact of technology in a global. Pol, PO2, PO3, PO4, PO4, PO4, PO3, PO4, PO4, PO4, PO4, PO4, PO4, PO4, PO4	No. of				1			3				· 100)
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Instruction Mode Isolution Exam Duration Image: State St													
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Course Outcomes (CO): Statement Mapped Program Outcomes (POs) C0 Understanding of the basic knowledge of electrical quantities such as current, voltage, power, energy and frequency to understand the impact of technology in a global. P0, P02, P03, C02 Illustrate an understanding of basic concepts of analysis of simple DC and AC circuits used in electrical and electronic devices P02, P03, P06, C03 Demonstrate an understanding of selection skill to identify the type of motors required for particular application. P02, P03, P06, C04 Analyze and evaluate the effects of electric shock and precautionary measures. P03, P04, P05, P0r- Engineering Knowledge. P02- Problem analysis, P03- Design/development of solutions, P04- Conduc investigations of complex problems, P05- Modern tool usage, P06, The engineer and society, P07- Environment an sustainability, P08- Ethics, P09- Individual or team work, P06- Communication, P0n- P01, P01, P01, P01, P01- Engineering Knowledge. P02 P03 P04, P03 P06, P07, P08, P09, P00, P00, P01, P01, P01, C01 2 2 1 2 <										pplicati	ons.		
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COr Outcomes (POs) COr Understanding of the basic knowledge of electrical quantities such as current, voltage, power, energy and frequency to understand the impact of technology in a global. POr, PO2, PO3 CO2 Illustrate an understanding of basic concepts of analysis of simple DC and AC circuits used in electrical devices PO2, PO3, PO6, PO2, PO3, PO6, PO2, PO3, PO6, PO2, PO3, PO6, PO1, PO2, PO3, PO6, PO1, PO1, PO4, PO7, PO3, PO6, PO1, PO1, PO1, PO3, PO6, PO1, PO1, PO1, PO3, PO6, PO1, PO1, PO1, PO1, PO1, PO1, PO1, PO2, PO3, PO6, PO1, PO3, PO6, PO1, PO6, PO1, PO1, PO1, PO1, PO1, PO1, PO1, PO1		comes (C	CO):			-							
CO1 current, voltage, power, energy and frequency to understand the impact of technology in a global. PO1, PO2, PO3 CO2 and AC circuits used in electrical and electronic devices PO2, PO3, PO8 CO3 motors required for particular application. PO3, PO4, PO8, PO8 CO4 motors required for particular application. PO3, PO4, PO3, PO8 CO4 motors required for particular application. PO3, PO4, PO7 PO4. PO4, PO4, PO7 PO5. Engineering motors required for particular application. PO4, PO4, PO7 PO4. PO5. PO6. PO6. PO4, PO4, PO7 PO5. Engineering measures. Nowledge, PO7. Poblem analysis, PO6. PO6. PO6. PO7. PO8. PO6. PO1. PO1. PO1. Outcomes PO1 PO2 PO3 PO4 PO5. PO6. PO7. PO8 PO10 PO11 PO11 CO2 2 2 1 2 1 2 1 2 CO3 3 2 1 2 1 2 1 2 1 1 1 </td <td>COs No.</td> <td></td> <td></td> <td></td> <td></td> <td>Stater</td> <td>nent</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	COs No.					Stater	nent						
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CO2 and AC circuits used in electrical and electronic devices PO2, PO3, PO6 CO3 motors required for particular application. PO2, PO3, PO6 CO4 masures. Analyze and evaluate the effects of electric shock and precautionary measures. PO1, PO4, PO7 PO1- Engineering Knowledge, PO2- Problem analysis, PO3- Design/development of solutions, PO4- Conduc investigations of complex problems, PO3- Modern tool usage, PO6- The engineer and society, PO7- Environment and sustainability. PO8- Ethics, PO9- Individual or team work, PO6- Communication, PO9- Project management and finance PO4- D01, PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO1 CO1 3 2 1 2 1 2 1 2 CO2 2 2 1 2 1 2 1 2 1 1 2 1 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>u neque</td> <td></td> <td>inueista</td> <td>nu uie</td> <td></td> <td>FO₁, FO₂, 1</td> <td>FU3</td>							u neque		inueista	nu uie		FO ₁ , FO ₂ , 1	FU3
and AC circuits used in electrical and electronic devices FO2, FO4, FO6 C03 Demonstrate an understanding of selection skill to identify the type of motors required for particular application. PO2, PO3 C04 Analyze and evaluate the effects of electric shock and precautionary measures. PO4, PO4, PO7 P01- Engineering Knowledge, PO3- Poroblem analysis, PO3- Design/development of solutions, PO4- Conductors, PO3- P01- Engineering Knowledge, PO3- PO1 PO4 PO3- PO4- PO3- P01- Engineering Knowledge, PO3- PO4 PO3- PO6- Comunication, PO4- PO1- Engineer and society, PO7- Environment an sustainability, PO3- Environment and sustainability, PO3- Environment and sustainability, PO3- Environment and sustainability, PO3- PO1- PO1	CO2						concents	of analys	is of sim	nle DC			
CO3 motors required for particular application. PO2_PO3 motors required for particular application. CO4 masures. PO2_PO3_PO3_PO3_PO3_PO3_PO3_PO3_PO3_PO3_PO3										ipic DC		PO ₂ , PO ₃ , 1	PO ₆
motors required for particular application. Image: Construct and the effects of electric shock and precautionary measures. PO2_PO3 POr Analyze and evaluate the effects of electric shock and precautionary measures. PO1_PO4_PO7 POr Engineering Knowledge, PO2- Problem analysis, PO3- Design/development of solutions, PO4- Conduc investigations of complex problems, PO3- Modern tool usage, PO6- The engineer and society, PO7- Environment and finance PO2- Life-long Learning Course PO4 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO1	CO ₃									e type	of		
CO4 measures. Analyze and evaluate the effects of electric shock and precautionary measures. PO1, PO4, PO7 PO1- For Engineering Kowledge, PO2- investigations of complex problems, PO3- bustinability, PO3- Ethics, PO9- Individual or team work, PO4- Complex PO1 PO3- PO3- Mapping of course outcomes with program outcomes PO1- PO1- PO1- PO1- PO2- PO1 PO2- PO3- PO1 PO3- PO3- PO3- PO4 PO5- PO3- PO5- PO6- PO7- PO8- PO7- PO8- PO7- PO8- PO9- PO9- PO1- PO9- PO1- PO9- PO1- PO1- PO1- PO1- PO1- PO1- PO1- PO1						0			J	- JT	-	PO ₂ , PC)3
Por- Engineering Knowledge, PO2- Problem analysis, PO3- Design/development of solutions, PO4- Conductive complex problems, PO3- Modern tool usage, PO4- The engineer and society, PO7- Environment and society, PO7- PO8- PO7-	CO ₄	Analyze	and ev					shock a	nd preca	autionai	гy	PO ₁ , PO ₄ , 1	PO 7
Outcomes Image: Column and the second se	investigation sustainability	s of comp 7, PO 8- Eth	lex prob ics, PO 9- Ig	lems, P(- Individ	D₅- Modual or tea	ern tool am work	usage, PO , PO 10 ⁻ Co	D ₆ − The en ommunicat	gineer an ion, PO 11-	d society Project r	y, PO ₇ - I	Environme	ent and
CO2221CO32212CO4312I - Reasonable; 2 - Significant; 3 - StrongDetailed Contents:Unit: 1DC Circuits: Electrical circuit elements (R, L and C), voltage and current sources Kirchoff current and voltage laws, analysis of simple circuits with dc excitation Superposition, Thevenin and Norton Theorems. Time-domain analysis of first-orde RL and RC circuits.Unit: 2AC Circuits: Representation of sinusoidal waveforms, peak and rms values, phaso representation, real power, reactive power, apparent power, power factor. Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel). Three-phase balanced circuits, voltage and current relations in star and delta connections.Unit: 3Transformers: Magnetic materials, ideal and practical transformer, equivalen circuit, losses in transformers, regulation and efficiency. Auto-transformer and three-phase transformer connections.Unit: 4Electrical Machines: Generation of rotating magnetic fields, Construction and working of a three-phase induction motor, Significance of torque-slip characteristic Loss components and efficiency, starting and speed control of induction motor Signigle-phase induction motor. Construction, working, torque-speed characteristic and speed control of separately excited dc motor. Construction and working o synchronous generators.Unit: 5Electrical Installations: Components of LT Switchgear: Switch Fuse Unit (SFU)	investigation sustainability PO ₁₂ - Life-lor Course	s of comp 7, PO 8- Eth ng Learnin	lex prob ics, PO 9 ⁻ ng M	lems, P(- Individ apping	D ₅ - Modual or tea	ern tool am work se outc	usage, PG , PO 10 ⁻ Co omes wi	D ₆ - The en ommunicat th progra	gineer an ion, PO 11- m outco	d society Project r mes	y, PO 7- H nanagen	Environme nent and f	ent and inance,
CO3 2 2 1 2 1 2 CO4 3 1 1 2 1 <td>investigation sustainability PO₁₂- Life-lon Course Outcomes</td> <td>s of comp 7, PO₈- Eth ng Learnir PO₁</td> <td>lex prob ics, PO₉- ng M PO2</td> <td>lems, PG - Individ apping PO3</td> <td>D₅- Modual or tea</td> <td>ern tool am work se outc</td> <td>usage, PG , PO10⁻ Co omes wi</td> <td>D₆- The en ommunicat th progra</td> <td>gineer an ion, PO11- m outco</td> <td>d society Project r mes</td> <td>y, PO7- H nanagen</td> <td>Environme nent and f</td> <td>ent and</td>	investigation sustainability PO ₁₂ - Life-lon Course Outcomes	s of comp 7, PO ₈ - Eth ng Learnir PO ₁	lex prob ics, PO ₉ - ng M PO 2	lems, PG - Individ apping PO 3	D ₅ - Modual or tea	ern tool am work se outc	usage, PG , PO 10 ⁻ Co omes wi	D ₆ - The en ommunicat th progra	gineer an ion, PO 11- m outco	d society Project r mes	y, PO 7- H nanagen	Environme nent and f	ent and
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MCB, ELCB, MCCB, Types of Wires and Cables, Earthing. Types of Batteries	investigation sustainability PO12- Life-lor Outcomes CO1 CO2 CO3 CO4 Detailed Co Unit: Unit:	s of comp y, PO ₈ - Eth ng Learnin PO ₁ 3 3 ontents: 1 2 3	lex probies, PO ₉ - ag M PO2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	lems, PG Individ apping PO ₃ 1 2 2 ircuits: off curr positio d RC ci rcuits: sentatic gle-pha el). Thr connect former t, losse -phase ical M ng of a t compor -phase peed co ronous	Ds- Mod ual or ter of cour PO4 PO4 1 Reason Electri rent an n, Theve rcuits. Repress on, real se ac cin ee-phas tions. rs: Mag es in tr transfo achines hree-pi nents an inducti ontrol c genera	ern tool am work se outco PO5 able; 2 - cal circo d voltagenin an- entation power, recuits cose balar metic re ansform rmer cose se balar metic re ansform rmer cose se former cose to moto of separ tors.	usage, PG , PO ₁₀ - Co omes wi PO ₆ 1 - Signific uit elem ge laws, d Norton n of sinu reactive onsisting need circo naterials ners, reg onnection ration co luction r iency, st cor. Cons rately ex	De- The en mmunicat th progra PO7 PO7 2 cant; 3 – S ents (R, L analysis Theorem soidal wa power, aj g of R, L, C cuits, volt d, ideal a gulation a ns. of rotatin, notor, Sig tarting an struction, cited dc	gineer an ion, PO ₁₁ - m outco PO ₈ and C), of simple s. Time- veforms, pparent , RL, RC, age and nd prace nd effic g magne nificance d speed working motor. (voltage e circui domain power, j RLC con current tical tra iency. A etic fiele e of torque constru	PO ₁₀ PO ₁₀ PO ₁₀ and cuts with a analysi modern from the second power from the secon	PO ₁₁ PO ₁₁ PO ₁₁ urrent sc dc exci s of first values, p factor. An ons (seri ons in st ansforme her, equi ansforme characte luction n characte nd work	PO12 PO12 PO12 purces, tation. -order phasor nalysis es and ar and ivalent er and ivalent er and eristic. motor. eeristic ing of

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	Important Characteristics for Batteries. Elementary calculations for energy									
	consumption, power factor improvement and battery backup.									
Examination and Evaluation Pattern: It include both internal evaluation (30 marks) comprising two class										
sess	sessional exams/assignments/quiz/seminar presentation etc. and external evaluation (70 marks)									
whic	which is mainly end semester examination.									
Text Books:										
1	D. P. Kothari and I. J. Nagrath, "Basic Electrical Engineering", Tata McGraw Hill, 2010.									
2	D. C. Kulshreshtha, "Basic Electrical Engineering", McGraw Hill, 2009.									
Refe	Reference Books:									
1	L. S. Bobrow, "Fundamentals of Electrical Engineering", Oxford University Press, 2011.									
2	E. Hughes, "Electrical and Electronics Technology", Pearson, 2010.									
3	V. D. Toro, "Electrical Engineering Fundamentals", Prentice Hall India, 1989.									

3 V. D. Toro, "Electrical Engineering Fundamentals", Prentice Hall India, 1989.

	Course Code		Course Title Lectur								ure	
BTCS111	Engineering Graphics & Design L T								ΓР	P Semester: I		
Version: 1.2					oval: 16	th BoS 17	7-11-2022		1 1	l 4		
	Scheme	e of Inst	ructior	1			S	cheme o	of Exami	nation		
	Periods	: 60) Hrs.			Maximum Score : 100						
Periods	/	: 4				Internal Evaluation : 30						
Credits : 4									End Ser		: 70	
Instruction Mode:Theory & PracticalExam DuraPrerequisite(s):Basic knowledge of Mathematics and Physics								ration	: 3 H	łrs.		
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Course Obj												
	erstand t											
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	itions Pla							isometri	c scale,	isometi	ic view	8-
Course Out		U	108, 511	ipie and	1 Comp	ound Sol	lius.					
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CO3 NO.					Staten	nene					tcomes	
CO ₁	Get ac	nuainte	d with	the kr	nowledg	e of va	rious line	es, geon	netrical			<u> </u>
001							ds of scal]	PO1, PO3,	PO ₉
CO ₂							owledge a			es	D0 -	
	and pla		0		50	0	0	1	,	РО	2, PO ₃ , PO	D ₅ , PO ₉
CO ₃	-		ient in d	lrawing	the pro	ojections	of variou	s solids		РО	2, PO5, PO	D ₆ , PO ₉
CO ₄				0	-	8	etric pro				2, PO4, PO	
PO1- Engine	ering Kn	owledge	. PO ₂ -	Problem	analys	is. PO ₃ -	Design/d	evelopme	nt of s	olutions.	PO ₄ - (Conduct
PO ₁₂ - Life-lor	ng Learnir	-	apping	of cour	se outc	omes wi	th progra	m outco	mes	1	[
Course Outcomes	\mathbf{PO}_1	PO ₂	PO ₃	PO ₄	DO	-			-	70	DO	PO ₁₂
			103	PO4	PO ₅	PO ₆	PO ₇	PO ₈	PO ₉	PO ₁₀	PO ₁₁	1 012
CO ₁	2		2	FU ₄	PO5	PO ₆	PO ₇	PO ₈	PO ₉	PO ₁₀	PO ₁₁	1012
CO ₁ CO ₂	2	1		P O 4	2 PO5	PO ₆	PO ₇	PO ₈		PO ₁₀	PO ₁₁	1012
	2	2	2		2 2	PO ₆	PO ₇	PO ₈	1		PO ₁₁	
CO_2	2		2	1	2 2 2	3			1 1			
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CO ₂ CO ₃ CO ₄	ontents:	2 2 Introd and t includ	2 1 1 – luction heir sig	1 Reason to Eng mifican Rectai	2 2 able; 2 - ineerin ce, usa ngular l	3 - Signifia g Drawin ge of D Hyperbo	cant; 3 – S ng coveri rawing ir la (Gener	Strong ng, Princ astrumer al metho	1 1 1 1 ciples of nts, lett od only	Engine ering, (ering Gr Conic se id, Epic	raphics
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Examination and Evaluation Pattern: It include both internal evaluation (30 marks) comprising two class
sessional exams/assignments/quiz/seminar presentation etc. and external evaluation (70 marks)
which is mainly end semester examination.

Text Books:

1	Bhatt N.D., Panchal V.M. & Ingle P.R	. (2014). Engineering Drawing.	Charotar Publishing House.
		, (),	

2 Shah, M.B. & Rana B.C. (2008), Engineering Drawing and Computer Graphics, Pearson Education. **Reference Books:**

1 Agrawal B. & Agrawal C. M. (2012), Engineering Graphics, TMH Publication.

2 Narayana, K.L. & P Kannaiah (2008), Text book on Engineering Drawing, Scitech Publishers.

3 (Corresponding set of) CAD Software Theory and User Manuals

	Code			(Course	Title			Lect	ure		
BTCS150	BSP			Engine	eering P	hysics L	ıb.		LI	ГР	Seme	ster: I
Version: 1.2			Date	of Appr	oval: 16	th BoS 17	-11-2022		0 0) 4		
	Scheme	of Inst	ruction	1			S	cheme o	f Exami	nation		
No. of	Periods	: 60	Hrs.					Ma	aximum	Score	: 100)
Periods	/ Week	: 4						Inter	nal Eval	uation	: 50	
	Credits	: 2							End Ser	nester	: 50	
Instruction	n Mode	: Pr	actical					E	lxam Du	ration	: 3 H	lrs.
Prerequisit	e(s): Engi	neering	g Physic	es		•						
Course Obje	ectives:											
	ire comp											
2. To den	nonstrate	e to n	ew dev	velopm	ent in	physics	laborato	ry by s	successf	fully co	mpletin	g the
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	theory.											
CO ₄							ect and P				PO ₃ , PC	
PO1- Engine												
investigations												
sustainability			- Individ	ual or tea	am work	, PO 10- Co	mmunicati	on, PO 11-	Project n	nanagem	ent and f	inance
PO12- Life-lor	ng Learnin	<u> </u>					1					
Course		M	apping	of cour	se outc	omes wi	h prograi	n outcoi	mes			
Outcomes	PO ₁	PO_2	PO ₃	PO ₄	PO ₅	PO_6	PO ₇	PO ₈	PO ₉	PO ₁₀	PO ₁₁	PO ₁₂
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Course C	ode				Course	Title			L	ectu	re		
BTCS150			Bas			ngineerii	ng Lah		L	Т	Р	Seme	ster: I
Version: 1.2	601		Du			oproval:	ig Luo		0	0	4	beine	5001.1
10151011112	Scheme	e of Inst	ruction		<u></u>		S	cheme o	-	•	-		
No. of I			Hrs.	-					aximu			: 100)
Periods		: 4	111.01					Inter				: 50	
1	Credits	: 2							End			: 50	
Instruction			actical						xam			: 3 H	Irs.
Prerequisite		c Electr	rical Eng	gineerir	ng	1							
Course Obje	、 <i>i</i>			5	0								
1. To expe	riment t	he basi	cs of Sir	ngle and	d Three	Phase tr	ansforme	rs.					
3. To und characte	erstand eristics.	the b	asic co	oncept	of a '	Three-pl	on, armatu hase indu y analyzin	iction r	noto	an	d its		
Course Outo	comes (C	CO):											
COs No.					Stater	nent					-	pped Pr	0
											Ou	tcomes	(POs)
CO ₁	them to	labora	tory me	asurem	nents.		work the				Р	O 1, PO 2,	PO ₆
CO ₂		nance o	f an ele	ctric ci	rcuit as		tions that solving bo					PO3, PO	D 6
	. 1	the pr	inciples	s of op	eration	and the	main fea	tures of	f elec	tric		PO ₉	
CO ₃												105	
CO ₄ PO ₁ - Enginee	machine Evaluate ering Kne of comp	es and t e the sk owledge lex prob	their ap tills in u , PO 2- lems, PC	plicatio sing ele Problem D₅- Mode	ectrical a analys ern tool	measurir is, PO₃- usage, PC	ng devices Design/de D6- The eng	velopme: gineer an	d soci	ety, I	РО 7- Е	PO ₄ PO ₄ - C nvironme	ent an
CO4 PO1- Enginee investigations sustainability,	machin Evaluato ering Kno of comp PO 8- Eth g Learnin	es and t e the sk owledge lex prob ics, PO 9- ng M	their ap tills in us , PO 2- lems, PC - Individu apping	plicatio sing ele Problem D ₅ - Mode ual or tea of cour	ns ectrical : analys ern tool am work se outc	measurin is, PO 3- usage, PC , PO 10- Co omes wit	ng devices Design/de D6- The eng mmunicati th progran	evelopme gineer an on, PO 11- n outcor	d soci Projec mes	ety, I et ma	PO 7- E nagem	PO ₄ PO ₄ - C nvironmo tent and f	ent and inance
CO ₄ PO ₁ - Enginee nvestigations sustainability, PO ₁₂ - Life-lon	maching Evaluate ering Kno of comp PO 8- Eth	es and t e the sk owledge lex prob lics, PO 9-	their ap ills in u , PO ₂ - lems, PO - Individu	plicatio sing ele Problem D₅- Mode ual or tea	ectrical a analys ern tool am work	measurin is, PO 3- usage, PO , PO 10- Co	ng devices Design/de D6- The enş mmunicati	evelopme gineer an on, PO 11-	d soci Projec	ety, I et ma	РО 7- Е	PO ₄ PO ₄ - C nvironme	ent an inance
CO ₄ PO ₁ - Enginea nvestigations sustainability, PO ₁₂ - Life-lon Course	machin Evaluato ering Kno of comp PO 8- Eth g Learnin	es and t e the sk owledge lex prob ics, PO 9- ng M	their ap tills in us , PO 2- lems, PC - Individu apping	plicatio sing ele Problem D ₅ - Mode ual or tea of cour	ns ectrical : analys ern tool am work se outc	measurin is, PO 3- usage, PC , PO 10- Co omes wit	ng devices Design/de D6- The eng mmunicati th progran	evelopme gineer an on, PO 11- n outcor	d soci Projec mes	ety, I et ma	PO 7- E nagem	PO ₄ PO ₄ - C nvironmo tent and f	ent an inance
CO ₄ PO ₁ - Engined investigations sustainability, PO ₁₂ - Life-lon Course Outcomes	machin Evaluate ring Kno of comp PO ₈ - Eth g Learnin PO ₁	es and t e the sk owledge lex prob ics, PO 9 M PO 2	their ap tills in us , PO 2- lems, PC - Individu apping	plicatio sing ele Problem D ₅ - Mode ual or tea of cour	ns ectrical : analys ern tool am work se outc	measurin is, PO 3- usage, PO , PO 10- Co omes win PO 6	ng devices Design/de D6- The eng mmunicati th progran	evelopme gineer an on, PO 11- n outcor	d soci Projec mes	ety, I et ma	PO 7- E nagem	PO ₄ PO ₄ - C nvironmo tent and f	ent an
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CO ₄ PO ₁ - Enginee nvestigations sustainability, PO ₁₂ - Life-lon Course Outcomes CO ₁ CO ₂	machin Evaluate ring Kno of comp PO ₈ - Eth g Learnin PO ₁	es and t e the sk owledge lex prob ics, PO 9 M PO 2	heir ap ills in u , PO ₂ - lems, PC - Individu apping PO ₃	plicatio sing ele Problem D ₅ - Mode ual or tea of cour	ns ectrical : analys ern tool am work se outc	$\begin{array}{c} measurir\\ is, \mathbf{PO}_3-\\ usage, \mathbf{PC}\\ \mathbf{, PO}_{10}-Co\\ omes wir\\ \mathbf{PO}_6\\ 1 \end{array}$	ng devices Design/de D6- The eng mmunicati th progran	evelopme gineer an on, PO 11- n outcor	d soci Projec mes PO	ety, I et ma	PO 7- E nagem	PO ₄ PO ₄ - C nvironmo tent and f	ent an inanco
CO ₄ PO ₁ - Enginee nvestigations sustainability, PO ₁₂ - Life-lon Course Outcomes CO ₁ CO ₂ CO ₃	machin Evaluate ring Kno of comp PO ₈ - Eth g Learnin PO ₁	es and t e the sk owledge lex prob ics, PO 9 M PO 2	their ap ills in u , PO ₂ - lems, PC Individu apping PO ₃	plicatio sing ele Problem D ₅ - Modual or tea of cour PO ₄	ns ectrical i a analys ern tool am work se outc PO5	measurin is, PO_3 - usage, PC_6 omes with PO_6 1	ng devices Design/de D6- The eng mmunicati th progran	velopme: gineer an on, PO ₁₁ - m outcon PO ₈	d soci Projec mes PO	ety, I et ma	PO 7- E nagem	PO ₄ PO ₄ - C nvironmo tent and f	ent an inance
CO ₄ PO ₁ - Enginee nvestigations sustainability, PO ₁₂ - Life-lon Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄	machine Evaluate ring Kno of comp PO ₈ - Eth g Learnin PO ₁ 1	es and t e the sk owledge lex prob ics, PO 9 M PO 2	their ap ills in u , PO ₂ - lems, PC Individu apping PO ₃	plicatio sing ele Problem D ₅ - Modual or tea of cour PO ₄	ns ectrical i a analys ern tool am work se outc PO5	measurin is, PO_3 - usage, PC_6 omes with PO_6 1	ng devices Design/de Me- The enş mmunicati th progran PO 7	velopme: gineer an on, PO ₁₁ - m outcon PO ₈	d soci Projec mes PO	ety, I et ma	PO 7- E nagem	PO ₄ PO ₄ - C nvironmo tent and f	ent an inance
CO ₄ PO ₁ - Enginee nvestigations sustainability, PO ₁₂ - Life-lon Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Con List of expe	machine Evaluate ring Kne of comp PO ₈ - Eth g Learnine PO ₁ 1 1 1 ntents:	es and t e the sk owledge lex prob ics, PO ₉ - ng M PO ₂ 1 	their ap ills in u , PO ₂ - lems, PC Individu apping PO ₃ 1 1 1- nstratio	plicatio sing ele Problem D ₅ - Modual or tea of cour PO ₄ 1 Reason	ns ectrical i a analys ern tool am work se outc PO5 PO5	measurin is, PO_3 - usage, PC , PO_{10} - Co omes with PO_6 1 1 - Signific	ng devices Design/de D ₆ - The enş mmunicati th prograf PO 7	velopme: gineer an on, PO ₁₁ - n outcon PO ₈ trong	d soci Projec mes PO	ety, I et ma	PO ₇ - E nagem PO ₁₀	PO ₄ PO ₄ - C nvironmo ent and f PO ₁₁	PO
CO ₄ PO ₁ - Enginee nvestigations sustainability, PO ₁₂ - Life-lon Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Con List of expe 1. Basic saf	machine Evaluate of comp PO ₈ - Eth g Learnine PO ₁ 1 1 ntents: riments ety prec	es and t e the sk owledge lex prob ics, PO ₉ - ng M PO ₂ 1 1 /demo autions	heir ap ills in u. , PO ₂ - lems, PO ₂ - lems, PO ₃ PO ₃ 1 1 1- nstratio	plicatio sing ele Problem D ₅ - Modual or tea of cour PO ₄ 1 Reason Dns: luction	ns ectrical : a analys ern tool am work se outc PO5 able; 2 -	measurin is, PO_3 - usage, PC , PO_{10} - Co omes with PO_6 1 1 - Signific e of meas	ng devices Design/de Mmunicati th program PO ₇ cant; 3 – S	velopme: gineer an on, PO ₁₁ - n outcon PO ₈ trong	d soci Projec mes PO	ety, I et ma	PO ₇ - E nagem PO ₁₀	PO ₄ PO ₄ - C nvironmo ent and f PO ₁₁	PO
CO ₄ PO ₁ - Enginee nvestigations sustainability, PO ₁₂ - Life-lon Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Con List of expe 1. Basic saf meter, o	machine Evaluate ring Kn of comp PO ₈ - Eth g Learnine PO ₁ 1 1 1 1 PO ₁ 1 I I I I I I I I I I	es and t e the sk owledge lex prob ics, PO ₉ M PO ₂ 1 1 /demo autions ope. Rea	heir ap ills in u. , PO ₂ - lems, PO ₂ - lems, PO ₃ PO ₃ 1 1 1- nstratic . Introd l-life re	plicatio sing ele Problem D ₅ - Modual or tea of cour PO ₄ 1 Reason ons: luction	ns ectrical i a analys ern tool am work se outc PO5 able; 2 -	measurin is, PO_3 - usage, PC , PO_{10} - Co omes with PO_6 1 1 - Signific e of meas tors and	ng devices Design/de D ₆ - The enş mmunicati th prograf PO 7	velopme: gineer an on, PO ₁₁ - n outcon PO ₈ trong	d soci Projec mes PO	ety, I et ma	PO ₇ - E nagem PO ₁₀	PO ₄ PO ₄ - C nvironmo ent and f PO ₁₁	PO
CO ₄ PO ₁ - Enginee nvestigations sustainability, PO ₁₂ - Life-lon Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Con List of expe 1. Basic saf meter, o 2. Verificat	machine Evaluate ring Kno of comp PO ₈ - Eth g Learnin PO ₁ 1 1 ntents: riments ety prec scillosco ion of T	es and t e the sk owledge lex prob ics, PO ₉ - ng PO 2 1 1 	heir ap ills in u PO2- lems, PC Individu PO3 PO3 1 1- nstratio c. Introd il-life re i's and N	plicatio sing ele Problem D₅- Modual or tea of cour PO₄ 1 Reason luction sistors, Jorton '	ns ectrical : analys ern tool am work se outc PO5 able; 2 - and use , capaci Theoren	measurin is, PO_3 - usage, PC_1 , PO_{10} - Co omes win PO_6 1 1 - Signific e of meas tors and ms.	ng devices Design/de De- The enş mmunicati th prograr PO 7 PO 7 cant; 3 - S uring inst inductors	velopme gineer an on, PO ₁₁ - <u>PO₈</u> trong	d soci Projec mes PO 1	ety, J 9 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	PO ₇ - E nagem PO ₁₀	PO ₄ PO ₄ - C nvironmo eent and f PO ₁₁	PO mult
CO ₄ PO ₁ - Enginee nvestigations sustainability, PO ₁₂ - Life-lon Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Con List of expe 1. Basic saf meter, o 2. Verificat 3. Measurin	machine Evaluate ring Kno of comp PO ₈ - Eth g Learnin PO ₁ 1 1 1 1 ntents: riments ety prec scillosco ion of Th ng the s	es and t e the sk owledge lex prob ics, PO ₉ M PO ₂ 1 1 //demo sautions ope. Rea hevenin teady-s	heir ap iills in u PO2- lems, PC Individu apping PO3 1 1	plicatio sing ele Problem D ₅ - Modual or tea of cour PO4 1 Reason cons: luction esistors. Norton ' d trans	ns cctrical : analys ern tool am work se outc PO5 able; 2 - and use , capaci Theoren sient tir	measurin is, PO_3 - usage, PC_1 , PO_{10} - Co omes with PO_6 1 1 - Signific e of meas tors and ms. ne-respondent	ng devices Design/de De- The eng mmunicati th program PO 7 PO 7 cant; 3 – S uring inst inductors	velopme: gineer an on, PO ₁₁ - <u>PO₈</u> trong trong 	d soci Projec mes PO 1 1	ett, I et ma 9 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	PO ₇ - E nagem PO ₁₀	PO ₄ PO ₄ - C nvironmo eent and f PO ₁₁ mmeter,	multi
CO ₄ PO ₁ - Enginee nvestigations sustainability, PO ₁₂ - Life-lon Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Con List of expe 1. Basic saf meter, o 2. Verificat 3. Measurin change response	machine Evaluate ring Kno of comp PO ₈ - Eth g Learnin PO ₁ 1 1 1 1 ntents: riments riments riments cillosco ion of Th ng the s in voltage of R-L	es and t e the sk owledge lex prob ics, PO ₉ M PO ₂ 1 /demo autions ope. Rea hevenin teady-s ge (trar , and R	heir ap ills in u , PO ₂ - lems, PO Individu apping PO ₃ 1 1 1- instratio 2. Introd d.l-life re 3's and N state an isient n 2-C circ	plicatio sing ele Problem D ₅ - Modual or tea of cour PO4 1 Reason Sistors Jorton ' d trans nay be suits –	ns cctrical i analys ern tool am work se outc PO5 PO5 able; 2 - and use , capaci Theoren sient tir observy impeda	measurin is, PO ₃ - usage, PC , PO ₁₀ - Co omes with PO ₆ 1 1 - Signific e of meas tors and ms. me-responded on a nce calc	ng devices Design/de Mmunicati th program PO 7 Cant; 3 – S uring inst inductors onse of R- storage o ulation an	velopme: gineer an on, PO ₁₁ - PO ₈ PO ₈ trong trong c. L, R-C, oscillosc nd verifi	d soci Projec mes PO 1 1	ett, I et ma 9 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	PO ₇ - E nagem PO ₁₀ ter, ar C circ 1soida	PO ₄ PO ₄ - C nvironme ent and f PO ₁₁ mmeter,	multi a stery stat
CO ₄ PO ₁ - Enginee investigations sustainability, PO ₁₂ - Life-lon Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Con List of expe 1. Basic saf meter, o 2. Verificat 3. Measurin change response difference	machine Evaluate ring Kno of comp PO ₈ - Eth g Learnine PO ₁ 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	es and t e the sk owledge lex prob ics, PO ₉ M PO ₂ 1 1 /demo autions ope. Rea hevenin teady-s ge (trar , and R reen cui	heir ap iills in u , PO ₂ - lems, PO Individu apping PO ₃ 1 1 1- nstratio a Introd I-life re a's and N state an astent n C-C circ	plicatio sing ele Problem D ₅ - Modual or tea of cour PO 4 1 Reason Unction sistors, Jorton ' d trans nay be suits – id volta	ns cctrical : analys ern tool am work se outc PO ₅ PO ₅ able; 2 - and use , capaci Theoren sient tir observy impeda ge. Resc	measurin is, PO ₃ - usage, PC , PO ₁₀ - Co omes with PO ₆ 1 1 - Signific e of meas tors and ms. me-responded on a nce calc onance in	ng devices Design/de mmunicati th program PO 7 PO 7 cant; 3 – S uring inst inductors onse of R- storage of ulation an n R-L-C ci	ruments b. c. c. c. c. c. c. c. c. c. c. c. c. c.	d soci Projec mes PO 1 1 	ett, I ett ma 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	PO ₇ - E nagem PO ₁₀ ter, ar C circ Isoida bserva	PO ₄ PO ₄ - C nvironme ent and f PO ₁₁ mmeter, cuits to ation of	multi a ster phas
CO ₄ PO ₁ - Enginee investigations sustainability, PO ₁₂ - Life-lon Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Con List of expe 1. Basic saf meter, o 2. Verificat 3. Measurin change response difference 4. Transfor	machine Evaluate ring Kno of comp PO ₈ - Eth g Learnine PO ₁ 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	es and t e the sk owledge lex prob ics, PO ₉ M PO ₂ 1 1 /demo autions ope. Rea hevenin teady-s ge (trar , and R reen cu bservat	heir ap iills in u , PO ₂ - lems, PC - Individu apping PO ₃ 1 1 1- nstratic a. Introd I-life re i's and N state an asient n c-C circ rrent an ion of th	plicatio sing ele Problem D ₅ - Modual or tea of cour PO ₄ 1 Reason sistors, Norton ' d trans nay be suits – ad volta, ne no-le	ns cctrical i analys ern tool am work se outc PO ₅ able; 2 - and use , capaci Theoren sient tir observe impeda ge. Reso bad curr	measurin is, PO ₃ - usage, PC , PO ₁₀ - Co omes with PO ₆ 1 1 - Signific e of meas tors and ms. ne-respondent ed on a nce calc pnance in rent wav	ng devices Design/de Mmunicati th program PO ₇ cant; 3 – S uring inst inductors onse of R- storage of ulation an n R-L-C ci eform on	ruments c. c. c. c. c. c. c. c. c. c. c. c. c.	d soci Projec mes PO 1 1 vo and ope). catio	ety, I et ma 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	PO ₇ - E nagem PO ₁₀ ter, ar C circ Isoida bserva	PO ₄ PO ₄ - C nvironme ent and f PO ₁₁ mmeter, cuits to al steady ation of	multi a ster wave
CO ₄ PO ₁ - Enginee investigations sustainability, PO ₁₂ - Life-lon Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Con List of expe 1. Basic saf meter, o 2. Verificat 3. Measurin change response difference 4. Transfor	machine Evaluate ring Kno of comp PO ₈ - Eth g Learnine PO ₁ 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	es and t e the sk owledge lex prob ics, PO ₉ - ng PO ₂ 1 1 /demo autions ope. Rea hevenin teady-s ge (trar , and R een cu bservat -H curv	heir ap iills in u. , PO ₂ - lems, PC - Individu PO ₃ 1 1 1- nstratio a Introd I-life re s's and N state an asient n c-C circ rrent an ion of the	plicatio sing ele Problem D ₅ - Modual or tea of cour PO ₄ 1 Reason 1 Reason cons: luction esistors. Norton ' d trans nay be suits – id volta, ne no-lo nearity	ns cctrical i analys ern tool am work se outc PO5 able; 2 - and use , capaci Theoren sient tir observe impeda ge. Resc bad curr should	measurin is, PO ₃ - usage, PC , PO ₁₀ - Co omes with PO ₆ 1 1 - Signific e of meas tors and ms. ne-responded on a nce calc ponance in rent wav be show	ng devices Design/de Mmunicati th program PO ₇ eant; 3 – S uring inst inductors onse of R- storage of ulation an n R-L-C ci eform on a	ruments c. c. c. c. c. c. c. c. c. c. c. c. c.	d soci Projec mes PO 1 1 vo and ope). catio oscop discu	ety, I et ma 9 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	PO ₇ - E nagem PO ₁₀ ter, ar C circo isoida bserva on-sin n abou	PO ₄ PO ₄ - C nvironmo ent and f PO ₁₁ PO ₁₁ nmeter, cuits to al steady ation of nusoidal ut harm	multi a ster wave onics
CO4 PO1- Engined investigations sustainability, PO12- Life-lon Course Outcomes CO1 CO2 CO3 CO4 Detailed Con List of expe 1. Basic saf meter, o 2. Verificat 3. Measurin change response difference 4. Transfor shape du Loading 5. Three-p	machine Evaluate ring Kno of comp PO ₈ - Eth g Learnine PO ₁ 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	es and t e the sk owledge lex prob ics, PO ₉ - M PO ₂ 1 1 /demo autions ope. Rea hevenin teady-s ge (trar , and R reen cu bservat -H curv isforme nsform	heir ap ills in u. , PO ₂ - lems, PO - Individu PO ₃ 1 1 1- nstratic . Introd Il-life re is and N state an isient n c-C circ rrent an ion of the re nonli r: meas ers: Sta	plication sing ele Problem D ₅ - Modulal or tea of cour PO ₄ PO ₄ 1 Reason Dns: luction sistors Norton ' d transmay be suits – id volta ne no-le nearity uremer r and E	ns cctrical i analys ern tool am work se outc PO ₅ PO ₅ able; 2 - and use , capaci Theoren sient tir observ- impeda ge. Resc bad curr should at of pri Delta co	measurin is, PO ₃ - usage, PC , PO ₁₀ - Co omes with PO ₆ 1 1 - Signific e of meas tors and ms. me-respondent ed on a nce calc onance in rent wav be show mary ano onnection	ng devices Design/de Mmunicati th program PO ₇ cant; 3 – S uring inst inductors onse of R- storage of ulation an n R-L-C ci eform on	ruments ruments an oscill with a or ry voltag e and Cu	d soci Project mes PO 1 1 and ope). catio oscop discu ges an urren	R-L-Sinu R-L-Sinu n. O be (n. ssior nd cu t rel	PO ₇ - E nagem PO ₁₀ ter, ar C circ isoida bserva on - sin n abou irrent ations	PO ₄ PO ₄ - C nvironme ent and f PO ₁₁ nmeter, cuits to a steady ation of nusoidal ut harm s, and p ships (lin	multi a ster y stati ower. ne-lin

- 7. To Determine the Performance Characteristics of a Shunt Motor.
- 8. To Determine the Performance Characteristics of a Compound Motor.
- 9. Speed Control of DC Shunt Motor.
- 10. To Determine the Load Characteristics of a Shunt Generator.
- 11. To Determine the Load Characteristics of a Single Phase Induction Motor.

12. To Determine the Performance Characteristics of a Three Phase Induction Motor.

- 13. Demonstration of cut-out sections of machines: dc machine (commutator-brush arrangement), induction machine (squirrel cage rotor), synchronous machine (field winging slip ring arrangement).
- 14. Synchronous speed of two and four-pole, three-phase induction motors. Direction reversal by change of phase-sequence of connections. Torque-Slip Characteristic of an induction motor. Generator operation of an induction machine driven at super-synchronous speed.
- 15. Synchronous Machine operating as a generator: stand-alone operation with a load. Control of voltage through field excitation.
- 16. Demonstration of (a) dc-dc converters (b) dc-ac converters PWM waveform (c) the use of dc-ac converter for speed control of an induction motor and (d) Components of LT switchgear

Examination and Evaluation Pattern: It include both internal evaluation (50 marks) comprising two class sessional exams/ assignments/ quiz/ seminar presentation etc. and external evaluation (50 marks) which is mainly end semester examination.

Text Books:

1	Basic Electrical Engineering, S.N. Singh, PHI, Learning Private Limited.	

2 Electrical Machines M. N. Bandyopadhya, PHI, Learning Private Limited.

Reference Books:

1 Agrawal B. & Agrawal C. M. (2012), Engineering Graphics, TMH Publication.

2 Narayana, K.L. & P Kannaiah (2008), Text book on Engineering Drawing, Scitech Publishers.

3 (Corresponding set of) CAD Software Theory and User Manuals

Course C				(Course	Title			Lec	ture		
BTCS201						ithemati			L ′	Г Р	Sem	ester: II
Version: 1.2					oval: 16	th BoS 17	7-11-2022		3	1 0		
	Scheme	of Inst	truction	ı			S	cheme o	of Exam	ination		
	Periods	: 60) Hrs.						aximum)0
Periods		: 4							nal Eval		: 3	
	Credits	: 4							End Sei		: 7	-
Instructio			ecture					I	Exam Dı	ıration	: 3	Hrs.
Prerequisit	、 /	c know	ledge of	f Mathe	matics							
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	p the stu art the co											
							ey. ness of fi	t and ind	enende	nce of a	ttribut	ec
Course Out			ige of C	m-squa	it test	ioi goou			epenae		unu	.cs.
COs No.	comes (e	.0).			Stater	nent				Ma	nned I	rogram
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	discrete			F								
CO ₂			ous prot	ability	distribu	itions an	d their pi	operties	5.		PO ₂ , I	PO 3
CO ₃							ding mea			al	PO ₃ , 1	
	tenden	ey, corr	elation	and reg	ression	l .	e					
CO ₄							lata samp				PO _{5,} PO	-
PO1- Engine												
investigation												
sustainability PO ₁₂ - Life-lor			- maivia	ual or tea	am work	, PO ₁₀ - CO	mmumcat	1011, PO 11 ⁻	Project	nanagen	ient and	imance
	ig Learnin		anning	of cour	se outc	omes wi	th progra	m outco	mes			
Course												
Outcomes	PO ₁	PO ₂	PO ₃	PO ₄	PO ₅	PO_6	PO ₇	PO ₈	PO ₉	PO ₁₀	PO ₁₁	PO ₁₂
CO ₁	2											
CO ₂		2	2									
CO ₃			2	2								
CO ₄					1	1						2
			1 -	Reason	able; 2 -	- Signific	cant; 3 – 8	Strong				
Detailed Co	ntents:	1										
				•		<i>J</i> 1	aces, con		1	5	1	
						-	pendent					
Unit:	1						to the bi					
							lent rand					
			/shev's			ents, va	riance o	Jiast	iiii, Co	Telatio		mcient
						istributi	ons: Con	tinuous	randor	n variał	oles ar	nd their
							nd densi					
Unit:	2	densi						, -	- ,	L		8
		Bivar	iate Dis	tributi	ons: Biv	ariate di	stributio	ns and th	eir pro	perties,	distrib	ution of
							sities, Ba					
							l tenden					
Unit:	3						Poisson a					
	0	-		for the	se thre	ee distri	butions,	Correlat	ion an	d regre	ssion	– Rank
		corre	lation.				.1 .	1 6 -		~		
				iction ('urve fit	tting hy	the meth	od of lea	ist squa	res- fitt	ing of	straight
		Appli	ed Stati									
Unit:	4	Appli lines,	second	degree	parabo	las and r	nore gen	eral curv	es. Test	of sign	ificanc	e: Large
	4	Appli lines, sampl	second le test fo	degree or single	parabo e propo	las and r rtion, dif	nore gen fference o	eral curv of propoi	es. Test	of sign	ificanc	e: Large
	4	Applie lines, sampl of me	second le test fo ans, and	degree or single 1 differe	parabo e propo ence of	las and r rtion, dif standard	nore gen ference o l deviatio	eral curv of propoi ns.	es. Test tions, s	of sign ingle me	ificanc ean, di	e: Large ference
Unit:		Applie lines, sampl of me Small	second le test fo ans, and samp l	degree or single <u>l differe</u> l es: Te	parabo e propo ence of st for	las and r rtion, dif <u>standarc</u> single	nore gen fference o l deviatio mean, di	eral curv of propor <u>ns.</u> fference	res. Test rtions, s	of sign ingle me eans ar	ificanc ean, di id cor	e: Large ference relation
		Applie lines, sampl of me Small coeffi	second le test fo ans, and samp l	degree or single <u>l differe</u> l es: Te test for	parabo e propo ence of st for ratio o	las and r rtion, dif standard single of of varian	nore gen ference o l deviatio	eral curv of propor <u>ns.</u> fference	res. Test rtions, s	of sign ingle me eans ar	ificanc ean, di id cor	e: Large ference relation

	mination and Evaluation Pattern: It include both internal evaluation (30 marks) comprising two class
sess	ional exams/ assignments/ quiz/ seminar presentation etc. and external evaluation (70 marks)
whie	ch is mainly end semester examination.
Text	t Books:
1	Erwin Kreyszig, Advanced Engineering Mathematics, 9th Edition, John Wiley & Sons, 2006.
2	P. G. Hoel, S. C. Port and C. J. Stone, Introduction to Probability Theory, Universal Book Stall, 2003.
3	S. Ross, A First Course in Probability, 6th Ed., Pearson Education India, 2002.
4	W. Feller, An Introduction to Probability Theory and its Applications, Vol. 1, 3rd Ed., Wiley, 1968.
Refe	erence Books:
1	N.P. Bali and Manish Goyal, A text book of Engineering Mathematics, Laxmi Publications, Reprint,
	2010.
2	B.S. Grewal, Higher Engineering Mathematics, Khanna Publishers, 35th Edition, 2000.
3	Veerarajan T., Engineering Mathematics (for semester III), Tata McGraw-Hill, New Delhi, 2010.

Course C					Course				· · · · ·	ture		
BTCS2111	BST					Chemist			-	Г Р	Sem	ester: II
Version: 1.2					:oval: 16	th BoS 1	7-11-2022		Ŷ	1 0		
	Scheme			1			S	cheme o				
	Periods		Hrs.						aximum			00
Periods		: 4							nal Eva			
	Credits	: 4							End Sei			
Instruction			cture					E	Exam Dı	iration	: 3	Hrs.
Prerequisite	\	c know	ledge of	Chemi	istry							
Course Obje		nowled	ge of el	ectroch	emistry	. corros	ion and w	ater trea	tment	which a	reesse	ntial for
the Engl						,	ion ana ii					
				e of ato	mic, m	olecular	and elect	tronic m	odificat	ions w	hich ma	akes the
						on them.						
							or unders	standing	reactio	n pathv	vays.	
4. To acqu	ire the s	kills pe	rtaining	to spe	ctrosco	py and to	o apply th	em for n	nedical	and oth	ner field	
Course Outo	comes (C	:O):										
COs No.					Stater	nent				Ma	apped P	rogram
										0	utcome	s (POs)
CO ₁							olecular	and ele	ctronic		PO ₁ , F	PO 2
						luctivity						
CO_2							epts of				PO	3
							of water a					
CO ₃						onal and	conform	ational a	nalysis	of	PO ₂ , I	PO 4
-	molecu											
CO ₄				skills to	o get cle	ear conce	epts on ba	asic spec	troscop	ру	PO ₄ , I	PO 5
							-					
PO ₁ - Enginee investigations sustainability,	ering Kno of comp PO 8- Eth	owledge lex prob ics, PO 9-	, PO 2- lems, PO	Problem) 5- Mode	ern tool	<mark>fields.</mark> is, PO₃- usage, PC	Design/d D6- The en	gineer an	d societ	y, PO 7-	Environr	nent and
investigations	ering Kno of comp PO 8- Eth g Learnin	owledge lex prob ics, PO 9- g M	, PO 2- lems, PO - Individu apping	Problem 05- Mode 1al or tea of cour	analys ern tool am work se outc	fields. is, PO ₃ - usage, PO , PO ₁₀ - Co omes wit	Design/d D₀- The en mmunicat th progra	gineer an ion, PO 11- m outco	d society Project i mes	y, PO 7- i nanager	Environr nent and	nent and l finance,
investigations sustainability, PO ₁₂ - Life-lon	ering Kno of comp PO 8- Eth	owledge lex prob ics, PO 9 ⁻ g	, PO 2- lems, PC - Individu	Problem 5 - Mode 1al or tea	analys ern tool am work	<u>fields.</u> is, PO 3- usage, PO , PO 10- Co	Design/d D6- The en mmunicat	gineer an ion, PO 11-	d society Project i	y, PO 7-	Environr	nent and l finance,
investigations sustainability, PO ₁₂ - Life-lon Course	ering Kno of comp PO 8- Eth g Learnin	owledge lex prob ics, PO 9- g M	, PO 2- lems, PO - Individu apping	Problem 05- Mode 1al or tea of cour	analys ern tool am work se outc	fields. is, PO ₃ - usage, PO , PO ₁₀ - Co omes wit	Design/d D₀- The en mmunicat th progra	gineer an ion, PO 11- m outco	d society Project i mes	y, PO 7- i nanager	Environr nent and	nent and l finance,
investigations sustainability, PO ₁₂ - Life-lon Course Outcomes	ering Kno of comp PO ₈ - Eth g Learnin PO ₁	owledge lex prob ics, PO 9- g M PO 2	, PO 2- lems, PO - Individu apping	Problem 05- Mode 1al or tea of cour	analys ern tool am work se outc	fields. is, PO ₃ - usage, PO , PO ₁₀ - Co omes wit	Design/d D₀- The en mmunicat th progra	gineer an ion, PO 11- m outco	d society Project i mes	y, PO 7- i nanager	Environr nent and	nent and l finance,
investigations sustainability, PO ₁₂ - Life-lon Course Outcomes CO ₁ CO ₂ CO ₃	ering Kno of comp PO ₈ - Eth g Learnin PO ₁	owledge lex prob ics, PO 9- g M PO 2	, PO ₂ - lems, PC - Individu apping PO ₃	Problem D5- Mode al or tea of cour PO4 1	analys ern tool am work se outc	fields. is, PO ₃ - usage, PO , PO ₁₀ - Co omes wit	Design/d D₀- The en mmunicat th progra	gineer an ion, PO 11- m outco	d society Project i mes	y, PO 7- i nanager	Environr nent and	nent and l finance,
investigations sustainability, PO ₁₂ - Life-lon Course Outcomes CO ₁ CO ₂	ering Kno of comp PO ₈ - Eth g Learnin PO ₁	owledge lex prob ics, PO ₉ - g M PO 2 1	, PO ₂ - lems, PC - Individu apping PO ₃	Problem D5- Mode aal or tea of cour PO 4	analys ern tool am work se outc	fields. is, PO ₃ - usage, PO , PO ₁₀ - Co omes wit	Design/d D₀- The en mmunicat th progra	gineer an ion, PO 11- m outco	d society Project i mes	y, PO 7- i nanager	Environr nent and	nent and l finance,
investigations sustainability, PO ₁₂ - Life-lon Course Outcomes CO ₁ CO ₂ CO ₃	ering Kno of comp PO ₈ - Eth g Learnin PO ₁	owledge lex prob ics, PO ₉ - g M PO 2 1	, PO ₂ - lems, PC lot individu apping PO ₃	Problem Problem Js- Modu al or tea of cour PO4 1 1	a analys ern tool am work se outc PO ₅	fields. is, PO ₃ - usage, PC , PO ₁₀ - Co omes with PO ₆	Design/d D₀- The en mmunicat th progra	gineer an ion, PO ₁₁ - m outco PO ₈	d society Project i mes	y, PO 7- i nanager	Environr nent and	nent and l finance,
investigations sustainability, PO ₁₂ - Life-lon Course Outcomes CO ₁ CO ₂ CO ₃	ring Known of comp POs- Eth g Learnin PO1 2	wledge lex prob ics, PO ₃ - g PO ₂ 1 2	, PO ₂ - lems, PC - Individu apping PO ₃ 1 1 1	Problem D5- Modu al or tea of cour PO4 1 1 Reason	a analys ern tool am work se outc PO ₅ 1 able; 2 -	fields. is, PO ₃ - usage, PC , PO ₁₀ - Co omes with PO ₆ - Signific	Design/d D ₆ - The en mmunicat th progra PO ₇	gineer an ion, PO ₁₁ - m outco PO ₈ Strong	d societ Project r mes PO ₉	y, PO ₇ nanager PO ₁₀	PO ₁₁	PO ₁₂
investigations sustainability, PO ₁₂ - Life-lon Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄	ring Known of comp POs- Eth g Learnin PO1 2	wledge lex prob ics, PO ₃ - g PO ₂ 1 2 2 Molec	, PO ₂ - lems, PC - Individu apping PO ₃ 1 1 1- cular st	Problem Problem of cour PO4 1 1 Reason	a analys ern tool am work se outc PO5 1 able; 2 - e and '	fields. is, PO ₃ - usage, PO , PO ₁₀ - Co omes with PO ₆ - Signific	Design/d D ₆ - The en mmunicat th progra PO ₇ cant; 3 – S	gineer an ion, PO ₁₁ - m outcor PO ₈ Strong ding: Ato	d societ Project r mes PO ₉	y, PO ₇ nanager PO ₁₀	PO11	PO12
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Causes and Theories of corrosion – Chemical and electrochemical corrosion, Water line and pitting corrosion; Factors affecting rate of corrosion – Nature of metal and Nature of environment. Corrosion control Methods: using pure metal and alloys, modifying th environment, cathodic protection (sacrificial anodic and impressed currer cathodic). Surface coatings: Metallic coatings & methods of application of metallic coatings – hot dipping (galvanization & tinning), electroplatingUnit: 4Reactivity of Organic Molecules & Types of Reaction and Mechanism : Inductive effect, Resonance or Mesomeric effect, Electromeric effect, Hyper conjugation Carbocation, Carbanion & Free radical. Substitution, Addition and Eliminatio reaction.;Mechanism of the following reactions Aldol condensation, Cannizzaro reaction, Hoffmann reaction & Diels-Alder reaction spectroscopy. Basic concepts of Nuclear magnetic resonance Spectroscopy chemical shift. Introduction to Magnetic resonance imaging.Examination and Evaluation Pattern: It include both internal evaluation (30 marks) comprising two class sessional exams/ assignments/ quiz/ seminar presentation etc. and external evaluation (70 marks) whic
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Examination and Evaluation Pattern: It include both internal evaluation (30 marks) comprising two class
sessional exams/assignments/guiz/seminar presentation etc. and external evaluation (70 marks) which
is mainly end semester examination.
Text Books:
1 Chemistry: Principles and Applications, by M. J. Sienko and R. A. Plane.
2 Engineering Chemistry by P.C Jain & Monica Jain, Dhanpatrai Publishing Company (2008)
Reference Books:
1 Fundamentals of Molecular Spectroscopy, by C. N. Banwell
2 Engineering Chemistry (NPTEL Web-book), by B. L. Tembe, Kamaluddin and M. S. Krishnan.
3 Engineering Chemistry by S.S. Dara & Mukkati S. Chand & Co,New Delhi(2006)
4 Engineering Chemistry – Shasi Chawla, Dhantpat Rai publishing Company, NewDelhi (2008).
5 Engineering Chemistry – R. Gopalan, D. Venkatappayya, D.V. Sulochana Nagarajan – Vikas
Publishers (2008)
6 Engineering Chemistry J.C. Kuriacase & J. Rajaram, Tata McGraw Hills co., New Delhi (2004).

	Code			(Course	Title			Leo	ture		
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	Unit: 4	Pointers – definition, pointer variables, pointer expressions, arithmetic pointers, pointers and arrays, initializing pointers and functions and problems with pointers. Structures – definition, accessing structure members, structure assignments, array of structures, passing structures, structure pointers, uses of structures Unions – definitions, difference between structure and union, type def. Files – introduction to streams and files, basics of files – file pointer, opening and closing files, writing and reading character, file functions.
		Principles of OOP: Programming paradigms, basic concepts, benefits of OOP,
		applications of OOP Introduction to C++: History of C++, structure of C++, basic data
	Unit: 5	types, type casting, type modifiers, operators and control structures, input and
		output statements in C++. Classes and objects: class specification, member function
		specification, scope resolution operator, access qualifiers, instance creation.
		aluation Pattern: It include both internal evaluation (30 marks) comprising two class
sess	ional exams/ ass	signments/quiz/seminar presentation etc. and external evaluation (70 marks) which
is m	ainly end semest	er examination.
Text	t Books:	
1	Let Us C by Yas	shwanth Kanethar.
2	E. Balaguruswa	my, Programming in ANSI C, Tata McGraw-Hill.
Refe	erence Books:	
1	Object Oriente	d Programming with C++ By E.Balaguruswamy.

2 Programming in C, 2nd Edition, Oxford by Pradip Dey, Mannas Ghosh.

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COs No.		•			Staten	nent				Maj	pped	Program
										Ou	tcom	es (POs)
CO ₁	Read ar	nd write	paragr	aphs in	English	l confide	ntly				PO ₆ ,	PO ₁₀
CO ₂	Differe	ntiate ar	nong h	omonyr	ns, hom	ophones	, synonyn	ns and ar	ntonyms	5.	PO 6,	PO ₁₀
CO ₃							ormation				P	D ₁₂
				1			ports and			0		
CO ₄	Commu	inicate	with mo	ore con	fident a	mong sti	udents, te	achers 8	k other		PO ₈	PO ₁₂
	stakeho											
PO ₁ - Engin												
investigation												
sustainabilit	.V. PO8- Eth	$1CS$ PU_{9} -	individi	ial or tea	im work,	PO10- COI	ninunicati	DN, PO 11- I	Project II	lanagem	entai	id mance
			manna									
PO ₁₂ - Life-lo		ıg			se outco		h prograf	n outcor	nes			
	ong Learnin	ng Ma	apping	of cours		omes wit	h prograr					PO ₁
PO ₁₂ - Life-lo	PO1	ıg			se outco PO5		h prograr PO 7	n outcor PO ₈	nes PO ₉	PO 10	РС	PO11 2
PO ₁₂ - Life-lo Course	PO1	ng Ma	apping	of cours		omes wit				PO ₁₀	РС	11
PO ₁₂ - Life-lo Course Outcomes	PO1	ng Ma	apping	of cours		omes wit PO ₆					PC	11
PO ₁₂ - Life-lo Course Outcomes CO ₁ CO ₂ CO ₃	PO1	ng Ma	apping	of cours		PO ₆				3	PC	2
PO ₁₂ - Life-lo Course Outcomes CO ₁ CO ₂	PO1	ng Ma	PO ₃	PO4	PO ₅	PO ₆	PO ₇	PO ₈		3	PC	2
PO ₁₂ - Life-lo Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄	PO1	ng Ma	PO ₃	PO4	PO ₅	PO ₆		PO ₈		3	PC	2 2 3
PO ₁₂ - Life-lo Course Outcomes CO ₁ CO ₂ CO ₃	PO1	9 PO2	PO3 PO3	of cours PO4 Reason	PO5 able; 2 -	PO ₆	PO ₇	PO ₈		3	PC	2 2 3
PO ₁₂ - Life-lo Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄	PO1	PO2 PO2	PO3 PO3 1 –	PO4 PO4 Reason	PO ₅ able; 2 -	PO6 2 2 Signific	PO7 ant; 3 - S	PO ₈		3	PC	2 2 3
PO ₁₂ - Life-lo Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed C	PO1 s PO1 ontents:	Ma PO2 Oral C 1.1. Co	PO3 PO3 1 - Commu mmuni	PO4 PO4 Reason nication cation:	PO 5 able; 2 - n: Verbal a	PO6 2 2 Signific	PO7 ant; 3 - S	PO ₈		3		2 2 3
PO ₁₂ - Life-lo Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄	PO1 s PO1 ontents:	Ma PO2 Oral C 1.1. Co 1.2. Cc	PO3 PO3 1 - Commu mmuni onversa	PO4 PO4 Reasona nicatior cation: tions ar	PO5 able; 2 -	PO6 2 2 Signific and Non- gues	PO ₇ ant; 3 - S -Verbal	PO ₈		3	PC	2 2 3
PO ₁₂ - Life-lo Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed C	PO1 s PO1 ontents:	Ma PO2 Oral C 1.1. Co 1.2. Cc 1.3. JA	PO3 PO3 1 – Commu mmuni onversa M Sessi	PO4 PO4 Reason nicatior cation: tions and	PO5 able; 2 -	PO6 2 2 Signific and Non- gues Discuss	PO7 ant; 3 – S -Verbal ions	PO ₈		3	PC	2 2 3
PO ₁₂ - Life-lo Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed C	PO1 s PO1 ontents:	Ma PO2 Oral C 1.1. Co 1.2. Cc 1.3. JA 1.4. Pr	PO3 PO3 1 - Commu mmuni onversa M Sessi esentat	PO4 PO4 Reasona nication cation: tions and ion Skil	PO5 able; 2 -	PO6 2 2 Signific and Non- gues	PO7 ant; 3 – S -Verbal ions	PO ₈		3	PC	2 2 3
PO ₁₂ - Life-lo Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed C	PO1 s PO1 ontents:	Ma PO2 PO2 Oral C 1.1. Co 1.2. Cc 1.3. JA 1.4. Pr Writir	PO ₃ PO ₃ 1 – Communi onversa M Sessi esentat ng Com	PO4 PO4 Reason nicatior cation: tions ar tions ar tions and ion Skil munica	PO₅ able; 2 - n: Verbal a nd Dialo d Group ils and I tion:	PO6 2 2 Signific and Non- gues Discuss nterview	PO7 ant; 3 – S -Verbal ions	PO ₈		3	PC	2 2 3
PO12- Life-lo Course Outcomes CO1 CO2 CO3 CO4 Detailed C	PO1 PO1 ontents: :: 1	Ma PO2 PO2 Oral C 1.1. Co 1.2. Cc 1.3. JA 1.4. Pr Writir 2.1. Su	PO3 PO3 1 - Communi onversa M Sessi esentat ng Com bject-v	PO4 PO4 Reason nicatior cation: tions and ion Skil munica erb agr	PO5 able; 2 - n: Verbal a nd Dialo d Group Is and I tion: eement	PO6 2 2 Signific and Non- gues Discuss nterview	PO7 ant; 3 – S -Verbal ions Skills	PO ₈		3		2 2 3
PO ₁₂ - Life-lo Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed C	PO1 PO1 ontents: :: 1	Ma PO2 PO2 Oral C 1.1. Co 1.2. Cc 1.3. JA 1.4. Pr Writir 2.1. Su 2.2. Pr	PO3 PO3 1 - Communi onversa M Sessi esentat ng Com bject-v écis Wi	PO4 PO4 Reason nication cation: tions and ion Skil munica erb agr riting an	PO5 able; 2 - n: Verbal a nd Dialo d Group ils and I tion: eement nd Essay	PO6 2 2 Signific and Non- gues Discuss nterview	PO7 ant; 3 - S -Verbal ions Skills	PO ₈		3		2 2 3
PO ₁₂ - Life-lo Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed C	PO1 PO1 ontents: :: 1	Ma PO2 PO2 Oral C 1.1. Co 1.2. Cc 1.3. JA 1.4. Pr Writir 2.1. Su 2.2. Pr 2.3. Le	PO3 PO3 1- Commu mmuni onversa M Sessi esentat ng Com bject-v récis Wi etter W	PO4 PO4 Reason nicatior cation: tions and ion Skil munica erb agr riting ar riting a	PO ₅ able; 2 - n: Verbal a nd Dialo d Group lls and I tion: eement nd Essay nd Cove	PO6 2 2 Signific and Non- gues Discuss nterview	PO ₇ ant; 3 – S -Verbal ions Skills	PO ₈		3		2 2 3
PO12- Life-lo Course Outcomes CO1 CO2 CO3 CO4 Detailed C Unit	PO1 PO1 ontents: :: 1	Ma PO2 PO2 Oral C 1.1. Co 1.2. Cc 1.3. JA 1.4. Pr Writir 2.1. Su 2.2. Pr 2.3. Le 2.4. Pc	PO3 PO3 1 - Commu mmuni onversa M Sessi esentat ng Com bject-v récis Wi etter W ortfolio	PO4 PO4 Reason nicatior cation: tions and ion Skil munica erb agr riting au riting au Writing	PO5 able; 2 - n: Verbal a nd Dialo d Group Is and I tion: eement nd Essay nd Cove g and Re	PO6 2 2 Signific and Non- gues Discuss nterview y Writing er Letters esume W	PO7 ant; 3 – S -Verbal ions Skills	PO ₈	PO9	3 3		
PO12- Life-lo Course Outcomes CO1 CO2 CO3 CO4 Detailed C	PO1 PO1 Ontents: :: 1 :: 2 on and Ev	Ma PO2 PO2 Oral C 1.1. Co 1.2. Cc 1.3. JA 1.4. Pr Writir 2.1. Su 2.2. Pr 2.3. Le 2.4. Pc aluation	PO3 PO3 1 - Communi onversa M Sessi esentat ng Com bject-v récis Wi exter Wi ortfolio n Patte:	PO4 PO4 Reason nicatior cation: tions and ion Skil munica erb agr riting au riting au riting au riting ar	PO₅ able; 2 - n: Verbal a nd Dialo d Group ls and I tion: eement nd Essay nd Cove g and Re clude b	PO6 2 2 Signific and Non- gues Discuss nterview y Writing er Letters esume W oth inter	PO7 ant; 3 – S -Verbal ions Skills s riting mal evalu	PO ₈	PO ₉	3 3	ising	two class
PO12- Life-lo Course Outcomes CO1 CO2 CO3 CO4 Detailed C Unit	PO1 PO1 Ontents: : 1 : 2 on and Ev xams/ ass	Ma PO2 PO2 Oral C 1.1. Co 1.2. Cc 1.3. JA 1.4. Pr Writir 2.1. Su 2.2. Pr 2.3. Le 2.4. Pc aluation	PO3 PO3 1- Communi onversa M Sessi esentat bject-v récis Wr écts Wr étter W ortfolio n Patte	PO4 PO4 Reason nication cation: tions and ion Skill munica erb agr riting au riting au riting au Writing Trn: It in z/ sem	PO₅ able; 2 - n: Verbal a nd Dialo d Group ls and I tion: eement nd Essay nd Cove g and Re clude b	PO6 2 2 Signific and Non- gues Discuss nterview y Writing er Letters esume W oth inter	PO7 ant; 3 – S -Verbal ions Skills s riting mal evalu	PO ₈	PO ₉	3 3	ising	two class
PO12- Life-le Course Outcomes CO1 CO2 CO3 CO4 Detailed C Unit Unit Examinatic sessional e is mainly e Text Books	PO1 PO1 PO1 Ontents: :: 1 :: 2 on and Ev xams/ ass nd semest s:	Ma PO2 PO2 PO2 Oral C 1.1. Co 1.2. Cc 1.3. JA 1.4. Pr Writir 2.1. Su 2.2. Pr 2.3. Le 2.4. Pc aluation signment cer exan	PO3 PO3 I - Commu mmuni onversa M Sessi esentat ng Com bject-v récis Wi etter W ortfolio n Patter its/ qui ninatior	PO4 PO4 Reason nicatior cation: tions and ion Skil munica erb agr riting ar riting ar	PO ₅ able; 2 - n: Verbal a nd Dialo d Group ls and I tion: eement nd Essay nd Cove g and Re clude b inar pre	PO6 2 2 3 Signific and Non- gues Discuss nterview y Writing er Letters esume W oth inter esentatio	PO7 ant; 3 – S -Verbal ions Skills Skills riting mal evalu n etc. and	PO ₈ 1 trong	PO9	3 3 compri tion (35	ising	two class
PO12- Life-le Course Outcomes CO1 CO2 CO3 CO4 Detailed C Unit Unit Examinatic sessional e is mainly e Text Books	PO1 PO1 Ontents: : 1 : 2 on and Ev xams/ assend semest	Ma PO2 PO2 PO2 Oral C 1.1. Co 1.2. Cc 1.3. JA 1.4. Pr Writir 2.1. Su 2.2. Pr 2.3. Le 2.4. Pc aluation signment cer exan	PO3 PO3 I - Commu mmuni onversa M Sessi esentat ng Com bject-v récis Wi etter W ortfolio n Patter its/ qui ninatior	PO4 PO4 Reason nicatior cation: tions and ion Skil munica erb agr riting ar riting ar	PO ₅ able; 2 - n: Verbal a nd Dialo d Group ls and I tion: eement nd Essay nd Cove g and Re clude b inar pre	PO6 2 2 3 Signific and Non- gues Discuss nterview y Writing er Letters esume W oth inter esentatio	PO7 ant; 3 – S -Verbal ions Skills Skills riting mal evalu n etc. and	PO ₈ 1 trong	PO9	3 3 compri tion (35	ising	two class
PO₁₂- Life-lc Outcomes CO₁ CO₂ CO₃ CO₄ Detailed C Unit Examinations sessional e is mainly es Text Books 1 Habe	PO1 PO1 PO1 Ontents: :: 1 :: 2 on and Ev xams/ ass nd semest s:	Ma PO2 PO2 PO2 Oral C 1.1. Co 1.2. Cc 1.3. JA 1.4. Pr Writir 2.1. Su 2.2. Pr 2.3. Le 2.4. Pc aluation signment cer exant 3) Englis	PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3	of cours PO4 PO4 Reason Reason Reason nicatior cation: tions and ion Skil munica erb agr riting au riting au riting au Writing rn: It in z/ sem n. peakers	PO5 able; 2 - n: Verbal a nd Dialo d Group ls and I tion: eement nd Essay nd Cove g and Re clude b inar pre	PO6 2 2 2 Signific and Non- gues Discuss nterview y Writing er Letters esume W oth inter esentatio	PO7 ant; 3 – S -Verbal ions Skills Skills riting mal evalu n etc. and	PO ₈ 1 trong	PO9	3 3 compri tion (35	ising	two class
PO₁₂- Life-lc Outcomes CO₁ CO₂ CO₃ CO₄ Detailed C Unit Examination sessional e is m⊒inly e Text Books 1 Habe 2 Kone	PO1 PO1 PO1 Ontents: :: 1 :: 2 on and Ev xams/ ass nd semest s: eb,G. (201	Ma PO2 PO2 PO2 Oral C 1.1. Co 1.2. Cc 1.3. JA 1.4. Pr Writir 2.1. Su 2.2. Pr 2.3. Le 2.4. Pc aluation signment cer exam 3) Englia	PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3	of cours PO ₄ Reason nicatior cation: tions and ion Skil munica erb agr riting au riting au writing ar riting ar riting as peakers Speakir	PO₅ able; 2 - n: Verbal a nd Dialo d Group ls and I tion: eement nd Essay nd Cove g and Re clude b inar pre of Urda g Skills	PO6 2 2 3 Signific and Non- gues Discuss nterview y Writing er Letters esume W oth inter esentatio	PO7 ant; 3 – S -Verbal ions Skills s riting mal evalu n etc. and ciency Co	PO ₈ 1 trong ation (15 externa urse: Ori	PO9	3 3 compri tion (35	ising	two class
PO₁₂- Life-ld Course Outcomes CO₁ CO₂ CO₃ CO₄ Detailed C Unit Examination sessional e is m⊒inly e Text Books 1 Habe 2 Kone	PO1 PO1 PO1 Ontents: : 1 : 2 on and Ev xams/ ass nd semest s: eb,G. (201 ar, S. & P. 1	Ma PO2 PO2 PO2 Oral C 1.1. Co 1.2. Cc 1.3. JA 1.4. Pr Writir 2.1. Su 2.2. Pr 2.3. Le 2.4. Pc aluation signment cer exam 3) Englia	PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3	of cours PO ₄ Reason nicatior cation: tions and ion Skil munica erb agr riting au riting au writing ar riting ar riting as peakers Speakir	PO₅ able; 2 - n: Verbal a nd Dialo d Group ls and I tion: eement nd Essay nd Cove g and Re clude b inar pre of Urda g Skills	PO6 2 2 3 Signific and Non- gues Discuss nterview y Writing er Letters esume W oth inter esentatio	PO7 ant; 3 – S -Verbal ions Skills s riting mal evalu n etc. and ciency Co	PO ₈ 1 trong ation (15 externa urse: Ori	PO9	3 3 compri tion (35	ising	two class
PO₁₂- Life-ld CO₁ CO₁ CO₂ CO₃ CO₄ Detailed C Unit Examination sessional e is mainly e Text Books 1 Habe 2 Kone 3 Kuma Reference	PO1 PO1 PO1 Ontents: : 1 : 2 on and Ev xams/ ass nd semest s: eb,G. (201 ar, S. & P. 1	Ma PO2 PO2 PO2 PO2 PO2 PO2 PO2 PO2	PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3	of cours PO4 PO4 Reasona nicatior cation: tions and ion Skil munica erb agr riting ar riting ar riting ar riting ar riting ar riting ar riting ar speakers Speakir nmunica	PO5 able; 2 - n: Verbal a nd Dialo d Group ls and I tion: eement nd Essay nd Cove g and Re clude b inar pre of Urda ag Skills ation Sk	PO6 2 2 3 Signific and Non- gues Discuss nterview y Writing er Letters esume W oth inter esentatio u: A Profi .OUP. cills. New	PO7 ant; 3 – S -Verbal ions Skills s riting nal evalu n etc. and ciency Co	PO ₈ 1 trong ation (15 externa urse: Ori	PO9	3 3 compri tion (35	ising	two class
PO₁₂- Life-la COurse Outcomes CO₁ CO₂ CO₃ CO₄ Detailed C Unit Sessional e is mainly e Text Books 1 Habe 2 Kone 3 Kuma Reference 1 O'Bria	PO1 PO1 PO1 PO1 Contents: Co	Ma PO2 PO2 PO2 PO2 PO2 PO2 PO2 PO2	PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3	of cours PO4 PO4 Reason nication cation: tions and ion Skil munica erb agr riting ar riting ar riting ar riting ar riting ar riting ar riting ar riting ar sem n. peakers Speakir nmunic ting Ski	PO5 able; 2 - n: Verbal a nd Dialo d Group ls and I tion: eement nd Essay nd Cove g and Re clude b inar pre of Urda g Skills ation Sk lls. New	PO6 2 2 2 Signific and Non- gues Discuss nterview y Writing er Letters esume W oth inter esentatio <i>i</i> : A Profi .OUP. <i>vills</i> . New	PO7 ant; 3 – S ant; 3 – S -Verbal ions Skills S siting rnal evalu n etc. and ciency Co 7 Delhi: O upa	PO ₈ 1 trong ation (15 externa urse: Ori UP.	PO9	3 3 compri tion (35	ising	two class

Course C					Course					cture			
BTCS212	EST					Mechani			_		Р	Sem	ester: II
Version: 1.2					r oval: 16	th BoS 17	7-11-2022		3	-	0		
	Scheme	of Inst	ruction	1			S	cheme o	f Exam	inatio	on		
	Periods	:	60 Hrs.						aximun				100
Periods			4						nal Eva			:	30
	Credits	:	4						End Se	meste	er		70
Instructio	n Mode	:	Lecture	2				Ε	xam D	uratic	on	:	3 Hrs.
Prerequisit	e(s): Engi	neering	g Mathe	matics	& Engin	leering P	hysics						
Course Obje													
						troid/ ce	enter of g	ravity an	d metł	nod of	f fin	ding	
	ls of con												
							ng momer						s.
			given d	ynamic	e problei	ms and s	olve them	for posi	tions,	veloci	ties	s and	
	tions, et												
			the rigi	d bodie	es and so	olve simp	le proble	ms using	g work-	energ	gy r	netho	d
Course Out	comes (C	: O):											
COs No.					Staten	nent							rogram
											Out	tcome	s (POs)
CO ₁							ntre of g	gravity a	and fir	nd	Р	O 1, PO	2. POo
					es and b							01, - 0	2, - 03
CO ₂					inertia a	and meth	nod of fin	ding mo	ment	of		PO ₃ , I	PO_6
	inertia											- 00, -	
CO ₃							ems and	solve t	hem f	or		РО	6
000	position	is, velo	cities ar	nd need	loration								0
CO ₄	Unders	tand th	e kineti	cs of th			nd solve	simple p	roblen	ns		РО	9
CO ₄ PO ₁ - Engined investigations sustainability.	Unders using w ering Kno of compl PO ₈ - Eth	tand th ork-en owledge, lex prob ics, PO 9-	e kineti ergy me PO 2- I lems, PO	cs of th ethod. Problem 95- Mode	he rigid analysi ern tool	bodies a s, PO ₃ - usage, PO	Design/de 6- The eng	velopmer gineer and	nt of s l societ	olutioi y, PO 7'	- Er	nvironn	Conduc nent and
PO ₁ - Engined investigations sustainability PO ₁₂ - Life-lon	Unders using w ering Kno of compl PO ₈ - Eth	tand th rork-en owledge lex prob ics, PO 9- g	e kineti ergy me PO₂- I lems, PO Individu	cs of th ethod. Problem ₀- Mode ial or tea	he rigid analysi ern tool am work,	bodies a s, PO 3- usage, PO PO 10- Cor	Design/de 6- The eng	velopmer gineer and on, PO 11- l	nt of s 1 societ Project i	olutioi y, PO 7'	- Er	PO 4- nvironn	Conduct nent and
PO ₁ - Engine investigations sustainability. PO ₁₂ - Life-lon Course Outcomes	Unders using w ering Kno of compl POs- Eth g Learnin PO ₁	tand th rork-en owledge. lex prob ics, PO 9- g M PO 2	e kineti ergy me PO₂- I lems, PO Individu	cs of th ethod. Problem ₀- Mode ial or tea	he rigid analysi ern tool am work,	bodies a s, PO 3- usage, PO PO 10- Cor	Design/de 6- The eng nmunicatio	velopmer gineer and on, PO 11- l	nt of s l societ Project nes PO 9	olutioi y, PO 7'	- Er gemo	PO 4- nvironn	Conduct nent and l finance,
PO ₁ - Engine investigations sustainability. PO ₁₂ - Life-lon Course Outcomes CO ₁	Unders using w ering Kno of compl PO 8- Eth g Learnin	tand th rork-en owledge, lex prob ics, PO 9- g M	e kineti ergy me PO ₂ - I lems, PO Individu apping o PO ₃	cs of th ethod. Problem 05- Mode 1al or tea of court	he rigid analysi ern tool am work, se outco	bodies a s, PO ₃ - usage, PO PO ₁₀ - Cor omes wit PO ₆	Design/de 6- The eng nmunication h prograr	velopmer gineer and on, PO 11- I n outcor	nt of s l societ Project n nes	olution y, PO 7 [,] manag	- Er gemo	PO₄- nvironn ent and	Conduct nent and l finance, PO 1
PO ₁ - Engined investigations sustainability. PO ₁₂ - Life-lon Course Outcomes CO ₁ CO ₂	Unders using w ering Kno of compl POs- Eth g Learnin PO ₁	tand th rork-en owledge. lex prob ics, PO 9- g M PO 2	e kineti ergy me PO2- I lems, PO Individu apping o	cs of th ethod. Problem 05- Mode 1al or tea of court	he rigid analysi ern tool am work, se outco	bodies a s, PO ₃ - usage, PO PO ₁₀ - Con omes wit PO ₆ 2	Design/de 6- The eng nmunication h prograr	velopmer gineer and on, PO 11- I n outcor	nt of s l societ Project nes PO 9	olution y, PO 7 [,] manag	- Er gemo	PO₄- nvironn ent and	Conduct nent and l finance PO 1
PO ₁ - Engined investigations sustainability. PO ₁₂ - Life-lon Course Outcomes CO ₁ CO ₂ CO ₂ CO ₃	Unders using w ering Kno of compl POs- Eth g Learnin PO ₁	tand th rork-en owledge. lex prob ics, PO 9- g M PO 2	e kineti ergy me PO ₂ - I lems, PO Individu apping o PO ₃	cs of th ethod. Problem 05- Mode 1al or tea of court	he rigid analysi ern tool am work, se outco	bodies a s, PO ₃ - usage, PO PO ₁₀ - Cor omes wit PO ₆	Design/de 6- The eng nmunication h prograr	velopmer gineer and on, PO 11- I n outcor	nt of s l societ Project nes PO 9	olution y, PO 7 [,] manag	- Er gemo	PO₄- nvironn ent and	Conduct nent and l finance, PO 1
PO ₁ - Engined investigations sustainability. PO ₁₂ - Life-lon Course Outcomes CO ₁ CO ₂	Unders using w ering Kno of compl POs- Eth g Learnin PO ₁	tand th rork-en owledge. lex prob ics, PO 9- g M PO2	e kineti ergy me PO ₂ - 1 lems, PO Individu apping o PO ₃	cs of the ethod. Problem 05- Mode aal or tea of cour PO4	he rigid analysi ern tool am work, se outco PO5	bodies a s, PO ₃ - usage, PO PO ₁₀ - Cor omes wit PO ₆ 2 2	Design/de 6- The eng nmunicati h prograr PO 7	velopmer gineer and on, PO ₁₁ - l n outcor PO ₈	nt of s l societ Project nes PO 9	olution y, PO 7 [,] manag	- Er gemo	PO₄- nvironn ent and	Conduct nent and l finance PO 1
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		Work-kinetic energy, power, potential energy. Impulse-momentum (linear,
		angular).
		Introduction to Kinetics of Rigid Bodies Covering-Basic terms, general principles
		in dynamics; Types of motion, Instantaneous center of rotation in plane motion and
	Unit: 5	simple problems; D'Alembert's principle and its applications in plane motion and
		connected bodies; Work energy principle and its application in plane motion of
		connected bodies; Kinetics of rigid body rotation;
Exa	mination and Ev	aluation Pattern: It include both internal evaluation (30 marks) comprising two class
sess	ional exams/ ass	signments/ quiz/ seminar presentation etc. and external evaluation (70 marks) which
is m	ainly end semest	er examination.
Text	t Books:	
1	F. P. Beer and E	2. R. Johnston (2011), Vector Mechanics for Engineers, Vol I - Statics, Vol II, –
	Dynamics, 9th	Ed, Tata McGraw Hill.
2	R. C. Hibbler (2	006), Engineering Mechanics: Principles of Statics and Dynamics, Pearson Press.
Refe	erence Books:	
1	Bansal R.K.(201	0), A Text Book of Engineering Mechanics, Laxmi Publications.
2	Khurmi R.S. (20	10), Engineering Mechanics, S. Chand & Co.

Course C			Course TitleLectureEngineering Chemistry Lab.LT							1			
BTCS260	BSP								_	Г Р	Seme	ster: I	
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	Periods		Hrs.						aximum		: 100		
Periods		: 4							nal Eval		: 50		
	Credits	: 2								Semester : 50			
Instruction			actical					E	xam Dı	iration	: 31	Irs.	
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14.	adsorption of acetic acid by charcoal
sess	mination and Evaluation Pattern: It include both internal evaluation (50 marks) comprising two class sional exams/ assignments/ quiz/ seminar presentation etc. and external evaluation (50 marks) which ainly end semester examination.
Tex	t Books:
1	Practical Engineering Chemistry by K. Mukkanti, etal, B.S. Publications, Hyderabad.
2	Inorganic quantitative analysis, Vogel.
Refe	erence Books:
1	Text Book of engineering chemistry by R. N. Goyal and Harrmendra Goel.
2	A text book on experiments and calculation Engg. S.S. Dara.
3	Instrumental methods of chemical analysis, Chatwal, Anand, Himalaya Publications.

Course C		ļ			Course					ture	4	
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16. Write a C Program to find the given integer number is even or odd number.17. Write a C Program to calculate the factorial of a given number.

18. Write a C Program to swap the two numbers using temp variable and without using temp variable.

19. Reading and printing a single dimensional array of elements.

20. Ascending and descending of an array.

21. Sum of all odd numbers and sum of all even numbers in a single dimensional array.

22. Mathematical operations on single dimensional arrays.

23. Reading and Printing a multi-dimensional array of elements.

24. Mathematical operations on multi-dimensional array of elements.

25. Passing an array element to a function.

26. Reading and Printing a string.

27. C Programs on String functions.

28. Write a C program to calculate string length by writing the user-define function.

29. Function declaration and initialization.

30. C Program to differentiate the parameters and arguments in functions.

31. Programs for different types of inbuilt functions.

32. Call by value and Call by reference programs in functions.

33. Write a program to swap the given 2 number using passing by reference.

34. Write C Programs to perform all valid arithmetic operations using pointers.

35. C programs on Structures and accessing of members of the structures.

36. Write a C program to print a book information (Book name, Book no, author name) by writing a structure.

37. Write a C program by passing structure elements to a function and display employee Information (emp no, emp name, emp salary, and emp address).

38. C Programs on Reading a file from the secondary storage device.

39. C Program on writing and appending a file on the secondary storage device.

40. C Program on Opening and closing a file.

41. Programs on Classes using C++.

Examination and Evaluation Pattern: It include both internal evaluation (50 marks) comprising two class sessional exams/assignments/quiz/seminar presentation etc. and external evaluation (50 marks) which is mainly end semester examination.

Text Books:

1 E. Balaguruswamy, Programming in ANSI C, Tata McGraw-Hill

2 Object Oriented Programming with C++ By E.Balaguruswamy

Reference Books:

1 Programming in C, 2nd Edition, Oxford by Pradip Dey, Mannas Ghosh

2 Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice Hall of India

	Code	Course Title Lectu								ectu	re	Semester		+
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Version: 1.2			Date				7-11-2022		0	0	6		11	
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Periods	/ Week	: 6						Inter	nal Ev	/alua	tion	:	50	
	Credits	: 3				End Seme					ester	:	50	
Instructio	n Mode	: Pi	ractical					Е	xam	Dura	tion	:	3 Hi	rs.
Prerequisite	e(s): Engir	neering	Mecha	nics										
Course Obje														
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- 1. **House Wiring:** Study of wiring tools, industrial wiring, accessories, earthling, and safety precaution. Practice to make parallel and series connection of three bulbs, stair case wiring, florescent lamp fitting.
- 2. **Machine Tools:** Study and demonstration on working of machine tools. Specification and block diagram of lathe, Drilling machine and grinder. Common lathe operations such as turning, parting, chamfering and facing. Difference between drilling and boring.

3. **Casting:** Study of Moulding Sands, Pattern, Core Prints, Role of Gate runner, riser, core, casting defects like blow holes & cavities. Practical Work: Mould of any pattern Casting of simple pattern, Solid pattern, Split pattern, multi- piece pattern.

Examination and Evaluation Pattern: It include both internal evaluation (50 marks) comprising two class sessional exams/ assignments/ quiz/ seminar presentation etc. and external evaluation (50 marks) which is mainly end semester examination.

Text Books: 1 Work shop Manual - P.Ka

1 Work shop Manual - P.Kannaiah/ K.L.Narayana/ Scitech Publishers.

2 Elements of Workshop Technology (Volume - 1): Hajra Choudhury.

3 Workshop Manual / Venkat Reddy/ BS Publications/Sixth Edition.

Reference Books:

- 1 Hajra Choudhury S.K., Hajra Choudhury A.K. and Nirjhar Roy S.K., "Elements of Workshop Technology", Vol. I 2008 and Vol. II 2010, Media promoters and publishers private limited, Mumbai.
- 2 Kalpakjian S. And Steven S. Schmid, "Manufacturing Engineering and Technology", 4th edition, Pearson Education India Edition, 2002.

3 Gowri P. Hariharan and A. Suresh Babu,"Manufacturing Technology – I" Pearson Education, 2008.

4 Rao P.N., "Manufacturing Technology", Vol. I and Vol. II, Tata McGrawHill House, 2017.

Course Code BTCS260HSP					Course				Lect	ure		
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С	O ₃	Analyze	the sin	usoidal	and no	n-sinus	oidal oso	cillators.				PO ₂ , PO	5
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1	Robert Boylested, Louis Nashelky, "Electronic Devices and Circuit Theory", Pearson Education, New
	Delhi, India.
2	A. S. Sedra and K. C. Smith, "Microelectronic Circuits", New York, Oxford University
	Press, 1998.
3	Jacob Millman, Christor C. Halkias, " Electronic Devices and Circuits" , McGraw Hill Book company,
	New Delhi, India.
Refe	erence Books:
1	E. Norman lurch, "Fundamental of Electronics" , John Wiley and Sons, New York, USA.
2	Donald L. Schilling, Charles Belove, "Electronic Circuits: Discrete and Integrated," McGraw Hill
	Book company, Singapore.
3	P. R. Gray, R. G. Meyer and S. Lewis, "Analysis and Design of Analog Integrated
	Circuits", John Wiley & Sons, 2001.
4	J. V. Wait, L. P. Huelsman and G. A. Korn, "Introduction to Operational Amplifier
	theory and applications", McGraw Hill U. S., 1992.

Course			Course TitleLectureData Structure & AlgorithmsL									
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investigation sustainability PO12- Life-lor Course Outcomes CO1 CO2 CO3 CO4 Detailed Co Unit:	Space a ering Knc s of compl y, PO ₈ - Ething PO ₁ 2 2 2 0 0 0 1 2 2 2 2 2 2 2 2 2 2 2 2 2	wledge, ex probl cs, PO ₉ - g PO ₂ 2 2 2 2 2 4 4 4 4 4 4 8 5 4 5 4 5 4 5 4 5 4 5 5 4 5 5 1 5 1 5 1	PO ₂ - I ems, PO Individu pping c PO ₃ 2 2 2 2 2 2 1 - I uction imensis sis of A a Notat s: Repre- x, postf , deque c of Hor 1 lists: ations s ion Sor	Problem 5- Mode al or tea of cours PO₄ PO₄ 2 2 2 Reasona to dat ional, i lgorith ion, Th esentat ix evalue eue, ele noi Prol Linear, such as 't, Inser	rn tool of m work, se outco PO5 2 able; 2 - ta stru multi m: Tim eta Not ion, ele uation, ementar olem. circula polynoi rtion Sco	PO ₁₀ - Cor PO ₁₀ - Cor PO ₁₀ - Cor PO ₆ PO ₆ Signific ctures dimensic e Compl ation. mentary parenthe ry operat	6- The eng nmunication h program PO7 ant; 3 – Se and objunal, Elem exity and operation esis match cions and oubly link ipulation. Sort, Me	noutcom PO ₈ PO ₈ crong ectives entary Space applicat applicat ced lists, Sorting rging, M	, basic Operati Comple pplicati eues: Sir ions. R , eleme : what is erge So	PO ₁₀ PO ₁₀ PO ₁₀ e conc ions. exity, B ions su mple q ecursion ntary of s sortinort, Rac	PO ₁₁ PO ₁₁ epts An ig-O No chas in ueue, cir on Techr operatior ag, Bubbli dix Sort,	rays: fix to reular ique, as and e Sort.
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investigation sustainability PO12- Life-lor Course Outcomes CO1 CO2 CO3 CO4 Detailed Co Unit: Unit:	Space a ering Kno s of compl y, PO ₈ - Ethi ng Learning 2 2 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	wledge, ex probl cs, PO ₉ - g PO ₂ 2 2 2 2 2 4 4 5 4 5 4 5 4 5 4 5 5 4 5 5 4 5	PO ₂ - I ems, PO Individu Pping c PO ₃ 2 2 2 2 2 2 2 1 - 1 sis of A a Notat s: Repre- k, postf , deque- c of Hor 1 lists: ations so ion Sor Heap So Binary	Problem pr	rn tool of m work, se outco PO5 2 able; 2 - ta stru multi m: Tim eta Not ion, ele uation, ementar blem. circula polynor rtion Sc ary Tree	PO ₁₀ - Cor pmes wit PO ₆ PO ₆ Signific ctures dimensic e Compl ation. mentary parenthery operat with the second s	6- The eng mmunication h program PO7 ant; 3 – Si and obju- onal, Elem exity and operation exity and operation esis match ions and oubly link- ipulation. Sort, Me <u>idress Ca</u> ee travers	neer and on, PO ₁₁ - F noutcom PO ₈ ectives entary of Space as and a hing Que applicat sorting rging, M <u>lculation</u> al, comp	, basic Operations, R poplications, R , eleme ; what is erge Sc a Sort, E olete bir	PO ₁₀ PO ₁₀ PO ₁₀ e conc ions. exity, B ions su mple q ecursic ntary of s sortin ort, Rac Binary S hary tree	PO ₁₁ PO ₁₁ epts An ig-O No ich as in ueue, cir on Techr operation ag, Bubbl dix Sort, <u>search.</u> ee, heap,	rays: tation. fix to rcular hique, as and binary
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Exa	mination and Evaluation Pattern: It include both internal evaluation (30 marks) comprising two class
sess	ional exams/ assignments/ quiz/ seminar presentation etc. and external evaluation (70 marks) which
is m	ainly end semester examination.
Tex	t Books:
1	Data structures, Algorithms and Applications in C++, S.Sahni, University Press (India) Pvt.Ltd,
	2nd edition, Universities Press Orient Longman Pvt. Ltd.
2	Data structures and Algorithms in C++, Michael T.Goodrich, R.Tamassia and .Mount, Wiley student
	edition, John Wiley and Sons.
Refe	erence Books:
1	Data structures and Algorithm Analysis in C++, Mark Allen Weiss, Pearson Education. Ltd., Second
	Edition
2	Data structures and algorithms in C++, 3rd Edition, Adam Drozdek, Thomson
3	Data structures using C and C++, Langsam, Augenstein and Tanenbaum, PHI.
4	Problem solving with C++, The OOP, Fourth edition, W.Savitch, Pearson education.

Ve	Course Code BTCS312PCT					Course				Lec	ture	Seme	ster
Va		PCT			0		ctronics				Г Р	II	
ve	rsion: 1.2					oval: 16	th BoS 17	7-11-2022	-	U	1 0		
		Scheme			1			Sc	heme of			100	
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	erequisite urse Obje		leering	Physics	5								
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	CO ₂		Design and implement Combinational and Sequentia						ogic circ	uits.		PO ₃ , PO	9
	CO ₃							conversio)	PO ₁ , PO ₃	3,
		Analog				0	0			0			
	CO ₄	Implem	ent the	given l	ogical p	roblem	using PI	Ds.				PO ₃ , PO	4
	- Enginee												
	estigations												
	tainability,			Individu	al or tea	m work, .	PO 10 - COI	nmunicatio	on, PO 11- F	roject m	anageme	ent and fi	nance
PU	12- Life-long	g Learning		nning (of cours	e outco	mes wit	n progran	outcon	100			
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	utcomes	PO ₁	PO_2	PO_3	PO_4	PO_5	PO_6	PO_7	PO_8	PO ₉	PO ₁₀	PO ₁₁	2
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De			Digita opera binary arithn lCs, di	1 – 1 amenta l signa tions, E 7, octal netic, c gital log	Reasona Is of Di Is, digit Boolean hexade odes, e gic fami	gital Sy tal circu algebra cimal nu rror det	stems a uits, AN , exampl umber, b tecting a	nd logic f a D, OR, N es of IC g inary arit	amilies OT, NAI ates, num hmetic, o cting coo	mber sy one's an les, cha	rstems-l d two's tracteris	binary, s complea stics of o	signed ments digital
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De	Unit: 1	L	Digita opera binary arithm ICs, di TTL, T Comb Standa of log	1 – J amenta l signa tions, E 7, octal netic, c gital log Fri-stat ination ard rep ic func	Reasona ls of Di ls, digit Boolean hexade odes, e gic fami e logic. al Digit resenta ctions t	gital Sy tal circ: algebra cimal nu rror det ilies, TT al Circu tion for using K	stems an uits, AN , exampl umber, b tecting a L, Schott uits · logic fu -map, n	nd logic fa D, OR, N es of IC g inary ariti nd correc ky TTL ar nctions, l ninimizati	amilies OT, NAI ates, num hmetic, o eting coo ad CMOS K-map r on of lo	mber sy one's an des, cha blogic, i epreser ogical f	rstems- d two's uracteris nterfaci ntation, unction	binary, s complet stics of 6 ing CMC simplifie s. Don't	signed ments digita OS and cation
De		L	Digita opera binary arithm ICs, di TTL, T Comb Standa of log condit	1 – J amenta l signa tions, E 7, octal netic, c gital lo; Fri-stat ination ard rep ic func- tions, J	Reasona Is of Di Is, digit Boolean hexade odes, e gic fami e logic. al Digit resenta ctions u Multiple	gital Sy tal circ: algebra cimal nu rror det ilies, TT al Circu tion for using K exer, D	stems an uits, AN , exampl umber, b tecting a L, Schott nits logic fu -map, n e-Multip	nd logic fa D, OR, N es of IC g inary arit nd correc ky TTL ar nctions, 1 ninimizati olexer/De	amilies OT, NAI ates, num hmetic, o cting coo ad CMOS d CMOS coders,	mber sy one's an des, cha blogic, i epreser ogical f Adder	rstems- d two's uracteris nterfaci ntation, unction s, Subt	binary, s complet stics of c ing CMC simplific s. Don't ractors,	signed ments digita DS and cation cation care BCD
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De	Unit: 1	L	Digita opera binary arithm ICs, di TTL, 7 Comb Standa of log condit arithm popula	1 – J amenta l signa tions, E 7, octal netic, c gital log <u>Tri-stat</u> ination ard rep ic fund cions, l netic, c ar MSI o y enco	Reasona Is of Di Is, digir Boolean hexade odes, e gic fami e logic. al Digit resenta ctions u Multiple arry lo chips, d	gital Sy tal circ: algebra cimal nu rror det lies, TT al Circu tion for using K exer, D ok ahea igital co	stems an uits, AN , exampl umber, b tecting a L, Schott its logic fu -map, n e-Multip d adder omparate	nd logic fa D, OR, N es of IC g inary arit nd correc ky TTL ar nctions, 1 ninimizati olexer/De , serial a	amilies OT, NAI ates, num hmetic, o cting coo nd CMOS Ad CMOS K-map ro on of lo ecoders, dder, AI checker	mber sy pne's an des, cha blogic, i epreser ogical f Adder LU, eler /genera	rstems- d two's aracteris nterfaci ntation, unction s, Subt nentary utor, coo	binary, s complet stics of c ing CMC simplific s. Don't ractors, 7 ALU d le conve	signed ments digital DS and cation cation cation cation cation cation cation cation
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De	Unit: 1	L	Digita opera binary arithm ICs, di TTL, T Comb Standa of log condit arithm popula prioriti realizz Seque	1 – J amenta l signa tions, E 7, octal netic, c gital log fri-stat ination ard rep ic func- tions, J netic, c ar MSI of y enco tion. ential c	Reasona Is of Di Is, digit Boolean hexade odes, e gic fami e logic. al Digit resenta ctions u Multiple arry loc chips, d ders, do	gital Sy tal circi algebra cimal nu rror det lies, TT tal Circu tion for using K exer, D ok ahea igital cc ecoders and sys	stems an uits, AN , exampl umber, b tecting a L, Schott nits logic fu -map, n e-Multip ad adder omparato /drivers tems	nd logic fa D, OR, N es of IC g inary arit nd correc ky TTL ar nctions, I ninimizati olexer/De s, serial a or, parity o	amilies OT, NAI ates, num hmetic, o cting coo ad CMOS ad CMOS coders, dder, AI checker, ay devic	mber sy pne's an des, cha Blogic, i epreser ogical f Adder LU, eler /genera es, Q-M	rstems- d two's aracteris nterfaci ntation, unction s, Subt nentary ator, coo	binary, s complet stics of d ing CMC simplifie s. Don't ractors, 7 ALU d le conve od of fur	signed ments digital OS and cation cation care BCD esign erters nction
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De	Unit: 1 Unit: 2	2	Digita opera binary arithm ICs, di TTL, 7 Combi Standa of log condit arithm popula priorit realiza Seque A 1-bi K-T a shift r seque count	1 – I amenta l signa tions, E 7, octal netic, c gital log Fri-stat ination ard rep ic func- tions, I netic, c ar MSI of ty enco tion. ential c: t memo nd D ty egister nce ge ers des	Reasona Reasona Is of Di Is, digit Boolean hexade odes, e gic fami e logic. al Digit resenta ctions u Multiple arry loc chips, d ders, do ircuits ory, the rpes flip s, seria enerato sign usi	gital Sy tal circ: algebra cimal nu rror det lies, TT al Circu tion for using K exer, D ok ahea igital co ecoders and sys circuit flops, a l to para r ,ripp	stems an uits, AN a, example umber, b tecting a L, Schott nits logic fu -map, n e-Multip d adder omparato /drivers tems properti application illel conv le(Asynce flops, s	nd logic fa D, OR, N es of IC g inary arit nd correc ky TTL ar nctions, 1 ninimizati plexer/De , serial a pr, parity o for displ es of Bi st ons of flip erter, par hronous)	amilies OT, NAI ates, num hmetic, o cting coo nd CMOS d CMOS coders, dder, AI checker, ay devic able lato o flops, si allel to s counte	mber sy pne's an des, cha blogic, i epreser ogical f Adder LU, eler /genera es, Q-N h, the c hift reg erial co rs, syr	stems- d two's aracteris nterfaci ntation, unction s, Subt nentary ator, coo A metho clocked isters, a nverter, achrono	binary, s complet stics of o ing CMC simplific s. Don't ractors, ALU d le conve od of fut SR flip fl pplicatio , ring co ous cou	signed ments digital OS and cation cation cation BCD lesign, erters, nction lop, J- ons of unter, nters,

	Digital to analog converters: weighted resistor/converter, R-2R Ladder D/A
	converter, specifications for D/A converters, examples of D/A converter lCs,
	sample and hold circuit, analog to digital converters: quantization and encoding,
	parallel comparator A/D converter, successive approximation A/D converter,
	counting A/D converter, dual slope A/D converter ,A/D converter using voltage
	to frequency and voltage to time conversion ,specifications of A/D converters,
	example of A/D converter ICs
	Semiconductor memories and Programmable logic devices.
	Memory organization and operation, expanding memory size, classification and
	characteristics of memories, sequential memory, read only memory (ROM), read
Unit: 5	and write memory (RAM), content addressable memory (CAM), charge de coupled
	device memory (CCD), commonly used memory chips, ROM as a PLD,
	Programmable logic array, Programmable array logic, complex Programmable logic
	devices (CPLDS), Field Programmable Gate Array (FPGA).
	aluation Pattern: It include both internal evaluation (30 marks) comprising two class
	ignments/ quiz/ seminar presentation etc. and external evaluation (70 marks) which
is mainly end semest	er examination.
Text Books:	
1 M. M. Mano, "D	igital logic and Computer design", Pearson Education India, 2016.
2 Mansaf Alam, Ba	ashir Alam, "Digital Logic Design", PHI,2016
Reference Books:	
1 A. Kumar, "Fun	damentals of Digital Circuits", Prentice Hall India, 2016.
2 Anil K.Maini,"Di	gital Electronics", Wiley,2016.

BTCS311 Version: 1.2	Code	Course TitleLectureEngineering Mathematics-IIILT										
Version 19	BST									Г Р		[]
• CI 31011, 1,2	~ •				oval: 16	ith BoS 1	7-11-2022		U I	1 0		
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Periods	Week	: 4							nal Eval		: 30	
Transformed.	Credits	: 4							End Sei		: 70	r
Instructio			cture		TT			E	xam Dı	iration	: 3 H	rs.
Prerequisite Course Obje	<u>, , </u>	heering	Mather	natics-	11							
transfor 2. To expl operation 3. To under	mation a ore a va ons, and r erstand a	nd num riety o resulting nd learr	erical a f variou g prope n uses a	nalysis. us mat rties. nd appl	hematio	cal struc	ations, pa tures by nary and I	focusinş Partial di	g on m fferenti	athema al equat	tical of	jects,
							ngineerin Euler's m		chnolog	y.		
4. To impa		0	e of nui	nerical	integra	tion and	Euler's In	ethod.				
COs No.		,			State						Mappo Progra Outcon (POs	nm nes
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CO ₂						uations.					PO _{1,} PO	D ₁₂
CO ₃	Use of Linear,					et form	using Inte	egrating	factors	; -	PO ₃	
CO4		he app	lication			Law of	Cooling	– Law o	of natu	ral	PO 4, P 0	D 9
investigations sustainability, PO ₁₂ - Life-lon	PO ₈ - Ethi	cs, PO 9- g	Individu	al or tea	m work,	PO ₁₀ - Con	nmunicatio	n, PO 11- P	Project m			
	0		ipping (of cours	e outco	mes wit	n program	outcon	nes			
		Ma										
Course Outcomes	PO ₁	PO ₂	PO ₃	PO ₄	PO ₅	PO ₆	PO ₇	PO ₈	PO ₉	PO ₁₀	PO ₁₁	PO ₁ 2
Course Outcomes CO ₁	PO ₁			PO ₄	PO ₅	PO ₆	PO ₇	PO ₈	PO ₉	PO ₁₀	PO ₁₁	2
Course Outcomes CO ₁ CO ₂	PO ₁	PO ₂	PO ₃	PO ₄	PO ₅	PO ₆	PO ₇	PO ₈	PO ₉	PO ₁₀	PO ₁₁	PO ₁ 2 2
Course Outcomes CO ₁ CO ₂ CO ₃	PO ₁	PO ₂			PO ₅	PO ₆	PO ₇	PO ₈		PO ₁₀	PO ₁₁	2
Course Outcomes CO ₁ CO ₂	PO ₁	PO ₂	PO ₃	2					PO ₉	PO ₁₀	PO ₁₁	2
$\begin{array}{c} Course\\ \hline Outcomes\\ \hline CO_1\\ \hline CO_2\\ \hline CO_3\\ \hline CO_4\\ \end{array}$	PO ₁ 2 2	PO ₂	PO ₃	2			PO7			PO ₁₀	PO ₁₁	2
$\begin{array}{c} Course\\ \hline Outcomes\\ \hline CO_1\\ \hline CO_2\\ \hline CO_3\\ \hline CO_4\\ \end{array}$	PO ₁ 2 2 2 ntents:	PO2 2 Differ Equat factor of Nat	PO ₃ 2 2 <u>1 - 1</u> ions, Euros, Euros, Linea tural Gr	2 Reasona Equation ar, Bern owth an	ble; 2 – ons I- I s reduc oulli's E nd Deca	Signification Different Cible to H Equations ay, Ortho	ant; 3 – St ial Equati Exact Diff s, Applicat gonal Tra	rong ons an o erential ions to N jectories	2 overviev Equation S in Cart	w -Exac ons usin os Law o tesian a	ct Differ og Integ f Coolin nd Pola	2 2 centia rating g Law r form
Course Outcomes CO_1 CO_2 CO_3 CO_4 Detailed Co	PO1 2 2 	PO2 2 Differ Equat factor of Nat Differ Const form (x.V, N	PO ₃ PO ₃ 2 rential ions, Europhic rs, Linea tural Gr rential cant Cou of Partio fethod	2 Reasona Equation ar, Bern owth an Equatio efficien cular In of Varia	ble; 2 – ons I– I s reduc oulli's E ad Deca ons II– ts, Com tegral a attion of	Signific Different cible to H Cquations ay, Ortho Linear aplement and Spec Parame	ant; 3 – St ial Equati Exact Diff s, Applicat gonal Tra Differenti ary Funct ial types s ters for a	rong ons an o erential ions to N jectories al Equat ion and uch as e Second	2 overview Equations in Carricions of Particu arx, cos (Order 1	w -Exac ons usin cs Law o tesian a f Highe ilar Inte ax), sin(Differen	ct Differ ng Integ f Coolin nd Pola r Order egral, G ax), x^m , tial Equ	2 2 2 rentia rating g Law r form with enera e ^{ax} . V
Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Cor	PO1 2 2 1 1 2 2 1 2 1 2 2 1 2 2 2 2 2 2 2	PO2 2 Differ Equat factor of Nat Differ Const form x.V, M Applic Partia elimir Differ order	PO ₃ PO ₃ 2 <u>1 - 1</u> rential ions, Eura tural Gr rential cations cural Gr rential ant Coo of Partic fethod cations al Diffe nating t ential I one (S	2 Reasona Equation ar, Bern owth an Equation efficient cular In of Varia to Bend prential the arbi Equation Special	ble; 2 – ons I– I s reduce oulli's E ad Deca ons II– ts, Com tegral a ation of ling of E Equation trary cons (Lag forms),	Signific Different cible to H Cquations ay, Ortho Linear plement and Spec Parame Beams, E ions - Fo constants range's Method	ant; 3 – St ial Equati Exact Diff s, Applicat gonal Tra Differenti ary Funct ial types s	rong ons an o erential ions to N jectories al Equat ion and uch as e Second <u>tircuits a</u> of Partia itrary fu Nonline ration o	2 Diverview Equation S in Carri- tions of Particu arx, cos (Order 1 nd Simmal Diffe unctions ar Diffe f Varial	W -Exac ons usin S Law o tesian a f Highe ilar Inte ax), sin(Differen <u>ple Harr</u> rential s, Solut rrential bles for	et Differ g Integ f Coolin nd Pola r Order egral, G ax), x ^m , tial Equ nonic M Equatio ion of 1 Equatio	2 2 2 centia rating g Law r form with enera e ^{ax} . V lation fotior ns by Partia

	Function, Differentiation and Integration of Transforms, Application of Laplace
	Transform to Ordinary Differential Equations.
	Numerical Analysis- Numerical Integration, Trapezoidal rule, Simpson's One-
Unit: 5	Third rule, Simpson's Three-Eighth rule and Weddle's rule, Numerical
Unit. 5	Differentiation, Numerical Solution of Ordinary Differential Equations by Euler's
	Method, Euler's Modified Method and Runge-Kutta Method.
Examination and	Evaluation Pattern: It include both internal evaluation (30 marks) comprising two class
	assignments/quiz/seminar presentation etc. and external evaluation (70 marks) which
is mainly end sem	ester examination.
Text Books:	
1 Differential	Calculus by shantinarayana
2 Partial Diffe	ential Equation by Sneddon
3 Laplace Trai	nsform by Schaum's series
Reference Books:	
1 Numerical A	nalysis by Shastry
2 Engineering	Mathematics by B.V Ramana

Course Code Course Title									Le	cture	Sem				
BTCS311	HST					nd Socie			L	ΤF		Illi			
Version: 1.2					oval: 16	th BoS 17	7-11-2022		2	0 0		111			
	Scheme	of Inst	ruction	ı			S	cheme of	f Exan	inatio	ı				
No. of	Periods	: 30	Hrs.					M	aximu	n Scor	e : 50)			
Periods	s/Week	: 2						Inter	nal Ev	aluatio	n : 15				
	Credits	: 2							End Se	emeste	ester : 35				
Instructio	on Mode	: Leo	ture					F	Exam E	uratio	ration : 2 Hrs.				
Prerequisite	e(s): No st	ecific requisite.													
Course Obje	()		eenie requisite.												
,		entific a	and tec	hnologi	cal deve	elopmen	ts affect s	ociety a	nd the	enviro	nment.				
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		Contributions, governance and ethical issues in the context of emerging technologies, constructing risk, role of State, civil society organizations and industry
Exa	mination and Eva	luation Pattern: It include both internal evaluation (30 marks) comprising two class
sess	sional exams/ ass	ignments/ quiz/ seminar presentation etc. and external evaluation (70 marks) which
is m	ainly end semeste	er examination.
Tex	t Books:	
1	Science Techno	logy And Society – 2014,By K Siddhartha, Publisher: Kisalaya Publication; 1 Edition
2	Impact of Scien	ce and Technology on Society – 2012,by Ishwar Singh , Publisher: S.K. Kataria &
	Sons; Reprint 20	D12 edition
Refe	erence Books:	
1	Technology and	Society – 2010,by R.V.G Menon, Publisher: Pearson Education India; First edition
	(2010)	
2	Book: "The Futu	re: Six Drivers of Global Change"

Course Co	ode	Course Title Lect							ure	Semester				
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2. To study														
3. To learn								water po	ollutio	on,	soil po	lluti	on, r	noise
pollution,														
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	mination and Evaluation Pattern: It include both internal evaluation (15 marks) comprising two class
sess	ional exams/assignments/quiz/seminar presentation etc. and external evaluation (35 marks) which
is m	ainly end semester examination.
Tex	t Books:
1	A.K. De, Environmental Chemistry, New Age Publications, 2002.
2	E.P. Odum, Fundamentals of Ecology, W.B. Sunders Co., U.S.A.
Refe	erence Books:
1	G.L. Karia and R.A. Christain, Waste Water Treatment, Concepts and Design Approach, Prentice Hall
	of India, 2005.
2	Benny Joseph, Environmental Studies, Tata McGraw – Hill, 2005.
3	V.K. Sharna, Disaster Management, National Centre for Disaster Management, IIPE, Delhi, 1999.

Course C											cture		Semest	
BTCS360	DESP								L	Т	Р		III	
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2 Microelectronics circuits, Sedra and Smith, Oxford University Press, 1998.

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- 1A. Kumar, "Fundamentals of Digital Circuits", Prentice Hall India, 2016.2Anil K.Maini,"Digital Electronics", Wiley,2016.

Course	Code								ecture Sen			-	
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No. o	f Periods) Hrs.					Ma	aximui	n Score	: :	100)
Period	s/Week	: 4						Inter	nal Eva	luatior	ı :	50	
	Credits	: 2							End Se	emester	• :	50	
Instructi	equisite(s): Any computer programming course							xam D	uratior	tion : 3 Hrs.			
Prerequisit													
Course Obje	ectives:												
1. To learn	n the fund	amentals of writing Python programming.											
2. To unde	erstand co	ore Pytl	non scri	pting el	ements	such as	variables	and flow	ontr	ol stru	ctur	es.	
3. To read	l and writ	e Pytho	n files.										
4. To impa	art the kn	owledg	e of Pyt	hon sta	ndard li	brary an	d Explore	Python's	s objec	t-orier	nted	featu	ires.
Course Out	comes (C	0):											
COs No.					Statem	nent				Ma	ppe	d Pro	grai
										01	itco	mes (POs
CO ₁			<u> </u>				scripting	languag	es.			PO ₁	
\mathbf{CO}_2		2		~	3		concepts.					PO ₃	
CO ₃						Python.						PO ₃	
CO ₄	Apply I	Python	standar	d libra	ry and	Explore	Python's	object-c	oriente	d	PO	D ₅ , PO	9
PO1- Engine	feature												
investigation: sustainability PO 12- Life-lor	7, PO 8- Ethi	cs, PO 9-											
		Mapping of course outcomes with program outcomes											
Course	PO ₁		pping o PO ₃	of cours	e outco PO ₅	mes with	n program PO 7	outcom	es PO ₉	PO		PO 11	PC
Outcomes	5	Ma	1				· · ·			PO	, 1	P O 11	
Outcomes CO ₁	PO ₁	Ma	PO ₃				· · ·			PO	, 1	PO ₁₁	
Outcomes CO1 CO2	5	Ma	PO ₃				· · ·			PO ₁₀	, 1	PO ₁₁	
Outcomes CO1 CO2 CO3	5	Ma	PO ₃		PO ₅		· · ·		PO ₉	PO10	, 1	PO ₁₁	
Outcomes CO ₁ CO ₂	5	Ma	PO ₃	PO ₄	PO ₅	PO ₆	PO ₇	PO ₈		PO		PO 11	
Outcomes CO ₁ CO ₂ CO ₃ CO ₄	2	Ma	PO ₃	PO ₄	PO ₅	PO ₆	· · ·	PO ₈	PO ₉	PO ₁₀		PO ₁₁	
Outcomes CO ₁ CO ₂ CO ₃ CO ₄	2	Ma PO2	PO ₃ 3 3 1 - F	PO4	PO ₅ 2 ble; 2 -	PO ₆	PO ₇	PO ₈	PO ₉				2
Outcomes CO1 CO2 CO3	ontents:	Ma PO2 Introc and D Functi	PO ₃ 3 3 1 - F luction: 1 ata Type: ions, If, I:	PO4 Reasona History, s, Opera f- else, N	PO5 2 ble; 2 – Features tor, Inpu	PO ₆ Significa	PO ₇	PO ₈	PO ₉	on, Basic	Syn	tax, Va	ariabl
Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Co	ontents:	Ma PO2	PO ₃ 3 3 1 - F luction: 1 ata Type: ions, If, I: Continu	PO4 Reasona History, s, Opera f- else, N e, Pass	PO5 2 ble; 2 – Features tor, Inpu Jested if-	PO ₆ Significa s, setting u t-Output -else, Loo	PO7 mt; 3 – St	PO ₈	PO ₉	on, Basic	Syn	tax, Va	ariab
Outcomes CO1 CO2 CO3 CO4 Detailed Co Unit:	2 2 1 2 2 2 2 2 2 2 2 2 2	Ma PO2 Introc and D Functi Break, String	PO ₃ 3 3 1 - F luction: 1 ata Type: ions, If, I: Continu ; Manipu	PO4 Reasona History, s, Opera f- else, N e, Pass Ilation a	PO5 2 ble; 2 – Features tor, Inpu Jested if- nd Lists:	PO ₆ Significa s, setting u t-Output -else, Loo	PO7 mt; 3 – St p path, Wc , Printing o pping, For, V	PO ₈ rong orking wit n screen, While, Ne	PO ₉	on, Basic	- Syn ^a	tax, Va Stater	ariab
Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Co	2 2 1 2 2 2 2 2 2 2 2 2 2	Ma PO2 Introc and D Functi Break, String String	PO ₃ 3 3 1 - F luction: 1 ata Type: lons, If, I: Continu g Manipu gs: Access	PO4 History, s, Opera f- else, N e, Pass Ilation a	PO5 2 ble; 2 – Features tor, Inpu Jested if- nd Lists: ngs, Basi	PO ₆ Significa s, setting u t-Output -else, Loo	PO7 PO7 Int; 3 – St Ip path, Wc , Printing o pping, For, ' ons, String	PO ₈ rong orking wit n screen, While, Ne slices, Fu	PO ₉	on, Basic pps, Cor and Me	- Syn ^a atrol	tax, Va Stater	ariab
Outcomes CO1 CO2 CO3 CO4 Detailed Co Unit:	2 2 1 2 2 2 2 2 2 2 2 2 2	Ma PO2 Introc and D Functi Break, String String Lists:	PO ₃ 3 3 1 - F luction: I ata Type: lons, If, I: Continu g Manipu gs: Access Introduc	PO4 History, s, Opera f- else, N e, Pass Ilation action, acc	PO5 2 ble; 2 – Features tor, Inpu Jested if- nd Lists: ngs, Basi cessing li	PO6 Significa s, setting u t-Output -else, Loo c Operati st, Operati	PO7 mt; 3 – St p path, Wc , Printing o pping, For, V	PO ₈ rong orking wit n screen, While, Ne slices, Fu slices, Fu	PO ₉	on, Basic opps, Cor and Met	Syn ⁻ strol	tax, Va Stater s Metho	2 ariab ment ds
Outcomes CO1 CO2 CO3 CO4 Detailed Co Unit:	2 2 ntents: 2	Ma PO2 Introc and D Funct Break String String Lists: Funct Argun	PO ₃ 3 3 1 - F luction: I ata Type: ions, If, I: Continu gmanipu gs: Access Introductions and nents, An	PO4 Reasona History, s, Opera f- else, N e, Pass Ilation acc module onymou	PO5 2 ble; 2 – Features tor, Inpu lested if nd Lists: ngs, Basi cessing li s: Definin s functio	PO ₆ Significa s, setting u t-Output -else, Loo c Operati st, Operati ng a funct ons, Globa	PO7 PO7 Int; 3 – St Ip path, Wo , Printing o ping, For, V ons, String tions, Worl cion, Calling I and local	PO ₈ rong orking wit n screen, While, Ne slices, Fu slices, Fu cing with g a functio variables,	PO ₉ 1 h Pytho sted loo inction lists, Fu	on, Basico ops, Cor and Mer unction a es of fur	Syn ⁻ strol	tax, Va Stater s Metho	2 ariab ment ds
Outcomes CO1 CO2 CO3 CO4 Detailed Co Unit:	2 2 ntents: 2	Ma PO2 Introc and D Funct Break String String Lists: Funct Argun Impor	PO ₃ 3 3 1 – F luction: 1 ata Type: ions, If, I: Continu g Manipu gs: Access Introductions and nents, An ting mod	PO4 Reasona History, s, Opera f- else, N e, Pass Ilation action, acco module onymou lule, Mat	PO5 2 ble; 2 – Features tor, Inpu Vested if nd Lists: ngs, Basi cessing li s: Definin s functio h modul	PO ₆ Significa s, setting u t-Output -else, Loo c Operati st, Operati st, Operati ons, Globa e, Randor	PO7 PO7 Int; 3 – St Ip path, Wo , Printing o ping, For, V ons, String tions, Worl cion, Calling I and local n module, J	PO ₈ rong orking wit n screen, While, Ne slices, Fu cing with g a function variables, Packages,	PO ₉ 1 h Pytho sted loo notion lists, Fu on, Typ	on, Basico ops, Cor and Mer unction a es of fur osition	Syn Syn atrol	tax, Va Stater s <u>Metho</u> ns, Fu	2 ariab ment
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Outcomes CO1 CO2 CO3 CO4 Detailed Co Unit: Unit: Unit: Unit: Unit:	i 2 i i i <td>Ma PO2 Introc and D Funct Break String String Lists: Funct Argun Impor Regul Patter Readin Datab</td> <td>PO3 PO3 3 3 1 – I luction: I ata Type: ions, If, I: Continu S. Access Introductions and nents, An ting mod ar expre ns ng data fi ase: Introductions ase: Introductions</td> <td>PO4 Reasona History, s, Opera f- else, N e, Pass lation ac module onymou lule, Mat ssions: 1 rom keyt oduction</td> <td>PO5 2 ble; 2 – Features tor, Inpu Jested if nd Lists: ngs, Basi ressing li s: Defini s functio h modul Match fu Dooard, Op a, Conned</td> <td>PO₆ Significa s, setting u t-Output -else, Loo c Operati st, Operati st, Operati ng a funct ons, Globa e, Randor unction, S pening an ctions, Ex</td> <td>PO7 PO7 Int; 3 – St Int; 3 – S</td> <td>PO₈ rong orking with n screen, While, Ne slices, Fu <u>slices, Fu</u> da function variables, Packages, ttion, Mate le, Readir eries, Tra</td> <td>PO9 1 1 h Pytho sted lo notion lists, Fu on, Typ Compo ching</td> <td>on, Basic ops, Cor and Me inction a es of fur vsition_ VS Searc vriting f ns, Hand</td> <td>Syn: syn: atrol chods and N action ching illes,</td> <td>tax, Va Stater s <u>Metho</u> ns, Fu g, Moo error</td> <td>2 ariab ment ds nctic</td>	Ma PO2 Introc and D Funct Break String String Lists: Funct Argun Impor Regul Patter Readin Datab	PO3 PO3 3 3 1 – I luction: I ata Type: ions, If, I: Continu S. Access Introductions and nents, An ting mod ar expre ns ng data fi ase: Introductions ase: Introductions	PO4 Reasona History, s, Opera f- else, N e, Pass lation ac module onymou lule, Mat ssions: 1 rom keyt oduction	PO5 2 ble; 2 – Features tor, Inpu Jested if nd Lists: ngs, Basi ressing li s: Defini s functio h modul Match fu Dooard, Op a, Conned	PO ₆ Significa s, setting u t-Output -else, Loo c Operati st, Operati st, Operati ng a funct ons, Globa e, Randor unction, S pening an ctions, Ex	PO7 PO7 Int; 3 – St Int; 3 – S	PO ₈ rong orking with n screen, While, Ne slices, Fu <u>slices, Fu</u> da function variables, Packages, ttion, Mate le, Readir eries, Tra	PO9 1 1 h Pytho sted lo notion lists, Fu on, Typ Compo ching	on, Basic ops, Cor and Me inction a es of fur vsition_ VS Searc vriting f ns, Hand	Syn: syn: atrol chods and N action ching illes,	tax, Va Stater s <u>Metho</u> ns, Fu g, Moo error	2 ariab ment ds nctic
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Outcomes CO1 CO2 CO3 CO4 Detailed Co Unit: Unit: Unit: Unit: Unit: Examination exams/ assig examination. Text Books: 1 Sheeta	i 2 intents: intents: i 2 3 4 5 and Evalu (nments/q il Taneja an	Ma PO2 Introc and D Funct Break. String Lists: Funct Argun Impor Regul Patter Readin Datab ation Pa uiz/ ser	PO ₃ 3 3 1 – I luction: 1 ata Type: ions, If, I: Continuu g Manipu g Manipu gs: Access Introduct ions and hents, An ting mod ar expre ns ng data fi ase: Intro attern: Intre Attern: Intro Attern: Intro Attern:	PO4 PO4 Reasona History, s, Opera f- else, N e, Pass lation ar sing Stri- tion, acc module onymou lule, Mat ssions: I rom keyl oduction t include sentatio , "Pythop	PO5 2 ble; 2 – Features tor, Inpu Jested if- nd Lists: ngs, Basi essing li s: Defini s functic th modul Match fu Doard, Oj t, Connece both in n etc. an	PO6 Significa s, setting u t-Output -else, Loo c Operati st, Operati ng a funct ons, Globa e, Randor inction, S pening an ctions, Ex iternal ev d externa mming - 2	PO7 PO7 ant; 3 – St ap path, Wo ping, For, V ons, String tions, Vorli cion, Calling and local n module, J fearch func d closing fi ecuting qu aluation (3 l evaluation A Modular	PO ₈ rong orking wit n screen, While, Ne slices, Fu slices, Fu da function variables, Packages, tion, Mate le, Readir eries, Trai 0 marks) n (70 mark	PO9 1 1 h Pytho sted loo unction lists, Fu on, Typ Compo cching Compo cching mg and compr s) whic	on, Basic ops, Cor and Met nction a es of fur vriting f ns, Hand ising tw h is mai	Syn Syn trol chods and M action ching illes, dlling o cla nly e	tax, Va Stater s <u>Metho</u> ns, Fu g, Moo <u>error</u> ass ses nd ser	2 ariab ment ds nctic
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Course C			Course TitleLecDatabase Management SystemsL								Se	mester:
BTCS402	РСТ								L	Т Р		IV
Version: 1.2					:oval: 16	th BoS 1	7-11-2022		3	1 0		1 V
	Scheme						Se	cheme of				
	Periods) Hrs.							n Score	_	100
	/ Week	: 4								aluation	_	30
	Credits	: 4								emester	_	70
Instructio			ecture					E	lxam D	uration	:	3 Hrs.
Prerequisite		Struct	are and A	Algorith	nm							
	rstand th ving skill e differer	levels. nt user	views of	f the sar	ne store	ed data, c	combining		-			
 controllin To mana complex To acquir 	ge, plan system.	and c	oordinat	e resta	rt and 1	recovery	operatio	ns acros	s mult	iple use	rs fo	r a large
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			e file an									
CO ₃						includii mizatioi	ng B-tree 1.	, hashing	g, quer	У	PO 3,	PO ₅
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PO ₁ - Engineer investigations sustainability, I PO ₁₂ - Life-long	of comple PO 8- Ethic	x probl s, PO 9-	ems, PO ₅ Individua	- Moder al or tear	rn tool us n work, F	sage, PO 6 PO 10- Con	- The engi	neer and n, PO 11- Pi	society roject n	, PO 7- En	viron	ment and
Course	PO ₁	PO ₂	PO ₃	PO ₄	PO ₅	PO ₆	PO ₇	PO ₈	PO ₉	PO ₁₀	РС	PO ₁
Outcomes	PO1	PO ₂		PO4	PO5	PO ₆	P07	PU ₈	PU9	PO ₁₀	PC	2
CO ₁			2									
CO_2		2	3									
CO ₃			3		2							
CO ₄				1					1			
			1 – R	leasona	ble; 2 – 1	Significa	nt; 3 – St	rong				
Detailed Con	tents:	1										
Unit: 1	l	Data – Rel Acce Tran Quer – Be Relat	- Data ational M ss for a saction M y Proces yond ER ionship	Abstra Model – applicat Manage ssor. His C Design sets –	ction – Other M tions P ement – story of n Entition Addition	Instance Models – rograms data ba Data bas es, Attril onal feat	es and Sch Database – data se System se System outes and cures of	hemas – E Langua base U h Structu hs. Data b d Entity ER Mode	data N ges – I Jsers ure – S base de sets	lodels – DDL – DM and Adr torage M esign and – Relat	the H AL – ninis Aanag l ER d ionsl	trator – ger – the diagrams nips and
Unit: 2	2	Intro Enfo Desig Relat Divis	duction rcing Int gn – In ional Alg ion – Ex	to the tegrity ntroduc gebra – amples	e Relation constrain ction to Selection of Alge	onal Mo ints – C o Views on and p bra over	arge ente del – Int Querying 5 – Dest projection rviews – I 15 – Expre	cegrity C relationa roying / set oper Relationa	l data /alterii rations l calcu	– Logio ng Table – renan Ilus – Tu	cal d s an ning iple r	ata base d Views. – Joins – relational

	Form of Pagie SOL Querry Examples of Pagie SOL Queries Lister duction to
	Form of Basic SQL Query – Examples of Basic SQL Queries – Introduction to Nested Queries Correlated Nested Queries Set – Comparison Operators –
	Aggregative Operators – NULL values – Comparison using Null values – Logical
	connectivity's – AND, OR and NOT – Impact on SQL Constructs – Outer Joins –
Unit: 3	Disallowing NULL values – Complex Integrity Constraints in SQL Triggers and Active Data bases. Schema refinement – Problems Caused by redundancy
	Decompositions – Problem related to decomposition – reasoning about FDS –
	FIRST, SECOND, THIRD Normal forms – BCNF – Lossless join Decomposition –
	Dependency preserving Decomposition – Schema refinement in Data base Design
	- Multi valued Dependencies - FORTH Normal Form.
	Transaction Concept- Transaction State- Implementation of Atomicity and
	Durability Concurrent – Executions – Serializability– Recoverability –
	Implementation of Isolation – Testing for serializability- Lock –Based Protocols –
Unit: 4	Timestamp Based Protocols- Validation- Base Protocols – Multiple Granularity.
	Recovery and Atomicity - Log - Based Recovery - Recovery with Concurrent
	Transactions - Buffer Management - Failure with loss of nonvolatile storage-
	Advance Recovery systems- Remote Backup systems.
	Data on External Storage – File Organization and Indexing – Cluster Indexes,
	Primary and Secondary Indexes - Index data Structures - Hash Based
Unit: 5	Indexing - Tree base Indexing Comparison of File Organizations - Indexes and
	Performance Tuning- Intuitions for tree Indexes - Indexed Sequential Access
	Methods (ISAM) – B+ Trees: A Dynamic Index Structure.
	luation Pattern: It include both internal evaluation (30 marks) comprising two class
	gnments/ quiz/ seminar presentation etc. and external evaluation (70 marks) which
is mainly end semeste	er examination.
Text Books:	
	nagement Systems, Raghurama Krishnan, Johannes Gehrke, TATA McGrawHill
3rd Edition	r Concerts Silkewachetz Kerth McCurry bill Medition
2 Data base System Reference Books:	m Concepts, Silberschatz, Korth, McGraw hill, V edition
	f Database Systems, Elmasri Navrate Pearson Education
2 Introduction to	Database Systems, C.J.Date Pearson Education

	Course C					Course					ture	Sen	nester:
	BTCS403	РСТ				0	Systems				Т Р		IV
Ve	rsion: 1.2				of Appr	oval: 16	th BoS 1	7-11-2022		3	1 0		
		Scheme						Se	cheme of	Exami	nation		
		Periods		Hrs.					Ma	aximun	n Score		00
	Periods	/ Week	: 4						Inter	nal Eva	luation	: 3	
		Credits	: 4							End Se	mester	: 7	0
	Instructio			cture					E	xam D	uration	: 3	Hrs.
	erequisite	· /	g Electi	ronic Ci	rcuits/	Digital	Electror	nics					
Co	urse Objec												
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	semapho												
2.	To learn						ons can	be used	in the o	levelop	oment o	f appl	ication
~	program						1 1		1	1 /1		•,	
3.	To acqui					ncy and	d synchi	conization	n, and ap	oply th	em to v	vrite	correct
4	concurre					J f. J.				• ~ ~ ~ ~ ~ ~ ~ ~ ~			
4.	To impar		<u> </u>	e of varie	ous kind	is of de	sign prif	iciple of c	perating	syster	ns.		
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	CO ₂		0 7					r-based s		rooos		PO ₃	
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	CO ₄							lassical a	and rea	l-world	1 P(O ₃ , PO ₄	PO ₆
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inv	h- Engineer estigations												
	stainability, I h2- Life-long	PO ₈ - Ethic	s, PO 9-]	ndividua	l or tean	n work, F	O 10- Com		n, PO 11- P1	oject m			
PO		PO ₈ - Ethic Learning	s, PO 9- 1 Ma	ndividua	l or team f course	n work, F e outcoi	nes with	municatio	n, PO 11- Pr	roject m es	anageme	nt and	finance,
PO	12- Life-long	PO ₈ - Ethic	s, PO 9-]	ndividua	l or team f course PO4	n work, F	O 10- Com	municatio	n, PO 11- P1	oject m			finance,
PO	Course	PO ₈ - Ethic Learning	s, PO 9- 1 Ma	ndividua	l or team f course	n work, F e outcoi	nes with	municatio	n, PO 11- Pr	roject m es	anageme	nt and	finance,
PO	Course Dutcomes	PO ₈ - Ethic ELearning PO ₁	еs, РО 9-1 Ма РО 2	ndividua	l or team f course PO4	n work, F e outcoi	nes with	municatio	n, PO 11- Pr	roject m es	anageme	nt and	finance,
PO	Course Dutcomes CO ₁	PO ₈ - Ethic ELearning PO ₁	еs, РО 9-1 Ма РО 2	pping of PO ₃	l or team f course PO4	n work, F e outcoi	PO ₁₀ - Com nes with PO ₆	municatio	n, PO 11- Pr	roject m es	anageme	nt and	finance,
PO	Course Dutcomes CO ₁ CO ₂	PO ₈ - Ethic ELearning PO ₁	еs, РО 9-1 Ма РО 2	pping of PO ₃	l or team	n work, F e outcor PO 5	PO ₁₀ - Com nes with PO ₆	PO7	n, PO ₁₁ - Pr outcom PO ₈	roject m es	anageme	nt and	finance,
	Course Dutcomes CO ₁ CO ₂ CO ₃ CO ₄	PO ₈ - Ethic Ethic PO ₁ 2	еs, РО 9-1 Ма РО 2	pping of PO ₃	l or team	n work, F e outcor PO 5	PO ₁₀ - Com nes with PO ₆	municatio	n, PO ₁₁ - Pr outcom PO ₈	roject m es	anageme	nt and	finance,
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	Course Dutcomes CO ₁ CO ₂ CO ₃ CO ₄	PO ₈ - Ethic <u>Elearning</u> PO ₁ 2 <u>tents:</u>	Ma Ma PO ₂ 1 Syste Interp	ndividua pping of PO ₃ 2 2 1 – R m Softv preters;	l or team f course PO4 1 1 1 easonal vare: M Loading	e outcor PO5 Dle; 2 – S achine, g, Linkin	PO ₁₀ - Com nes with PO ₆ 2 Significa Assemb	PO7 nt; 3 – St elocation	n, PO ₁₁ - Pr outcom PO ₈ rong gh-Level	PO9 PO9 L Langu, Debuş	PO ₁₀ PO ₁₀ lages; Coggers.	PO11	PO ₁ 2 ers and
	Course Dutcomes CO ₁ CO ₂ CO ₃ CO ₄	PO ₈ - Ethic <u>Elearning</u> PO ₁ 2 <u>tents:</u>	Na Ma PO2 1 Syste Interp Basic	ndividua pping of PO ₃ 2 2 1 - R m Softv preters; s of O	l or team f course PO4 1 1 easonal vare: M Loading peratin	e outcor PO5 Dle; 2 – S achine, g, Linkin g Syste	PO ₁₀ - Com nes with PO ₆ 2 Significa Assemb ng and R ems: Op	nt; 3 – St program PO7 nt; 3 – St ply and Hi elocation perating	n, PO ₁₁ - Pr outcom PO ₈ rong gh-Leve ; Macros System	PO9 PO9 I Langu , Debuş Structu	PO10 PO10 Lages; Co ggers. ure, Opo	PO11	PO ₁ 2 Ers and ns and
	Course Dutcomes CO ₁ CO ₂ CO ₃ CO ₄	PO ₈ - Ethic <u>Elearning</u> PO ₁ 2 <u>tents:</u>	Na PO2 1 Syste Interp Basic Servio	ndividua pping of PO ₃ 2 2 1 - R m Softv preters; s of O	l or team f course PO4 1 1 easonal vare: M Loading peratin	e outcor PO5 Dle; 2 – S achine, g, Linkin g Syste	PO ₁₀ - Com nes with PO ₆ 2 Significa Assemb ng and R ems: Op	PO7 nt; 3 – St elocation	n, PO ₁₁ - Pr outcom PO ₈ rong gh-Leve ; Macros System	PO9 PO9 I Langu , Debuş Structu	PO10 PO10 Lages; Co ggers. ure, Opo	PO11	PO ₁ 2 Ers and ns and
	Course Dutcomes CO ₁ CO ₂ CO ₃ CO ₄	PO ₈ - Ethic <u>Elearning</u> PO ₁ 2 <u>tents:</u>	Syste Interp Basic Servic Boot.	ndividua pping of PO ₃ 2 2 1 – R m Softv preters; s of Op ces; Sys	l or team f course PO ₄ 1 1 easonal vare: M Loading peratin tem Ca	e outcor PO5 ple; 2 – 5 achine, g, Linkin g Syst ulls, Op	PO ₁₀ - Commes with PO ₆ 2 Significa Assemb and R ems: Operating-	PO 7 PO 7 nt; 3 – St Ply and Hielocation perating System E	n, PO ₁₁ - Pr outcom PO ₈ PO ₈ sigh-Leve system besign ar	PO9 PO9 I Langu , Debuş Structu ad Imp	PO10 PO10 lages; Cu ggers. ure, Opo lementa	PO ₁₁ PO ₁₁ ompile eration;	Finance,
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	Course Dutcomes CO ₁ CO ₂ CO ₃ CO ₄ etailed Con	PO ₈ - Ethic <u>Elearning</u> PO ₁ 2 tents:	S, PO ₉ - 1 Ma PO₂ 1 Syste Interp Basic Servid Boot. CPU Multi Deadl Preve	ndividua pping of PO ₃ 2 2 1 - R m Softworeters; s of Op ces; Sys Schedu ple-Proc ocks: Do ntion, A	l or team f course PO4 1 1 1 easonal vare: M Loading peratin tem Ca cessor S eadlock voidance	e outcor PO5 PO5 achine, g, Linkin g Syste Ills, Op Schedul Schedul c Charac ce and I	PO10- Com nes with PO6 2 Significa Assemb ng and R ems: Op erating- ing Cri ing, Real cterizatio Detection	nt; 3 – St program PO7 nt; 3 – St ly and Hi elocation perating System D teria and -Time CF on, Metho n; Recove	n, PO ₁₁ - Pr outcom PO ₈ pos gh-Leve ; Macros System pesign ar d Algori PU Sched ds for Ha ry from I	POject m es PO9 l Langu , Debuş Structu ad Imp thms; uling. undling Deadlo	anageme PO10 lages; Coggers. ure, Opolementa Thread Deadloocck.	POn POn ompile eration; Sche	PO1 2 ers and System eduling, eadlock
	Course Dutcomes CO ₁ CO ₂ CO ₃ CO ₄ etailed Con	PO ₈ - Ethic <u>Elearning</u> PO ₁ 2 tents:	Syste Interp Basic Servid Boot. CPU Multi Deadl Preve Memo	ndividua pping of PO ₃ 2 2 1 - R m Softworeters; s of Op ces; Sys Schedu ple-Procesic Do ntion, A pry Ma	l or team f course PO4 1 1 1 easonal vare: M Loading peratin tem Ca cling: S cessor S eadlock voidance magem	e outcor PO5 PO5 Jele; 2 – S achine, g, Linkin g Syste Ills, Op Schedul Schedul c Charac ce and I ent: C	PO10- Com nes with PO6 2 Significa Assemb ng and R ems: Op erating- ing, Real cterizatio Detection ontiguou	nt; 3 – St nt; 3 – St	n, PO ₁₁ - Pr outcom PO ₈ pO ₈ gh-Leve ; Macros System cesign ar d Algori PU Sched ds for Ha ry from I pry Allo	POject m es PO9 I Langu , Debuş Structu ad Imp thms; uling. undling Deadloo cation,	PO10 PO10 ages; Coggers. ure, Opolementa Thread Deadloocck. Swapp	nt and POn ompile eration; Sche cks, De	PO1 2 2 ers and System eduling, eadlock Paging,
	Course Dutcomes CO ₁ CO ₂ CO ₃ CO ₄ etailed Con Unit: 1	PO ₈ - Ethic <u>Elearning</u> PO ₁ 2 tents: 2	Syste Interp Basic Servic Boot. CPU Multi Dead Preve Memo Segm	ndividua pping of PO ₃ 2 2 1 - R m Softv oreters; s of Op ces; Sys Schedu ple-Proof ocks: Do ntion, A ory Ma entation	l or team f course PO4 1 1 1 easonal vare: M Loading peratin tem Ca iling: S cessor S eadlock voidance nagem h, Dem	e outcor PO5 PO5 Je; 2 – S achine, g, Linkin g Syste Schedul Schedul Schedul Charac ce and I ent: C nand P	PO10- Com nes with PO6 2 Significa Assemb ng and R ems: Operating- ing, Real cterizatio Detection ontiguon aging,	nt; 3 – St program PO7 nt; 3 – St ly and Hi elocation perating System D teria and -Time CF on, Metho n; Recove	n, PO ₁₁ - Pr outcom PO ₈ pO ₈ gh-Leve ; Macros System cesign ar d Algori PU Sched ds for Ha ry from I pry Allo	POject m es PO9 I Langu , Debuş Structu ad Imp thms; uling. undling Deadloo cation,	PO10 PO10 ages; Coggers. ure, Opolementa Thread Deadloocck. Swapp	nt and POn ompile eration; Sche cks, De	Finance, PO1 2 ers and system eduling, eadlock Paging,
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		Directory Implementation, Allocation Methods, Free-Space Management, Efficiency and Performance; Recovery, I/O Hardware, Application I/O Interface,
		Kernel I/O Subsystem, Transforming I/O Requests to Hardware Operations. Security: Protection, Access Matrix, Access Control, Revocation of Access Rights,
	··· ·	Program Threats, System and Network Threats; Cryptography as a Security Tool,
	Unit: 5	User Authentication, Implementing Security Defenses.
		Windows and Linux Operating Systems: Design Principles, File Systems, Input
		and Output; Inter-process Communication, Network Structure.
Exar	nination and Eval	uation Pattern: It include both internal evaluation (30 marks) comprising two class
sess	ional exams/ assig	gnments/ quiz/ seminar presentation etc. and external evaluation (70 marks) which
is m	ainly end semeste	r examination.
Text	t Books:	
1	Silberschatz, Gal	vin and Gagne, "Operating Systems Concepts", Wiley
2	SibsankarHalder	and Alex A Aravind, "Operating Systems", Pearson Education
Refe	erence Books:	
1	Harvey M Dietel,	"An Introduction to Operating System", Pearson Education
2	D M Dhamdhere	, "Operating Systems: A Concept based Approach", McGraw Hill
3	Charles Crowley	, "Operating Systems: A Design-Oriented Approach", Tata McGraw Hill Education".
4	Stuart E. Madnic	k & John J. Donovan. Operating Systems. McGraw Hill

Course C					ourse T				Lee	cture	Se	mester:
BTCS405	PCT					rogrami			L	T P		IV IV
Version: 1.2					v al: 18th	BoS 27-	02-2024		3	1 0		1 4
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	Periods		0 Hrs.							n Score	:	100
Periods	/ Week	: 4						Inte		aluation	:	30
	Credits	: 4								emester	:	70
Instructio			ecture]	Exam D	uration	:	3 Hrs.
Prerequisite	., .	ammin	g for Pro	oblem S	olving							
Course Object												
 language To elabo paramete To demo features. 	rstand th rate varia ers and an nstrate th re the kno	ible sco rgumer ie prino	opes, mo its in fui ciples of	emory in nction of object-	nanage calls. oriente	ment, ar d feature	nd refere	nce vei	rsus val	ue type	s in re	lation to
Course Outc					xceptic	/ii iiaiiaii	-11 <u>5</u> .					
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		ally in	cluding				lation,				1 01,	1 0 2,
CO ₂	from p	roblem	statem	ents us	sing sul	o-classir	ses and ıg, abstr -oriente	act cla	sses, a		Р	D ₃
CO ₃		strate	informe	ed use	of en		ion wit			ss	PO ₄ ,	PO ₅
CO ₄		xceptio	on hand	ing, gei	neratior	and eso	calation	mechar	nisms a	nd	PO 5,	PO ₉
investigations sustainability, I PO 12- Life-long	PO8- Ethic	s, PO 9- 1	ndividua	l or tean	n work, P	0 10- Com		on, PO 11-	Project			
Course												
Outcomes	PO ₁	PO_2	PO ₃	PO ₄	PO ₅	PO_6	PO ₇	PO ₈	PO ₉	PO ₁₀	PO	1 PO 12
CO ₁	2	2										
CO ₂			3									
CO ₃				2	2							
CO ₄					2				1			
			1 – R	easonal	ole: 2 – S	Sianifica	nt; 3 – S	trona				
Detailed Con	tents:					0 9						
Unit:		data opera contr	types, tor hier ol flow	variable archy, -block	es, cons express scope,	tants, s ions, typ conditio	cope an e conve	d life rsion ar ements	time of nd casti	f variab ing, enu	les, o merat	mments perators ed types continue
Unit: 1	2	Class meth and c	es and ods, par construc	Objects ameter tors, st	s: Abstr passing atic fiel	action, e g, access ds and r	encapsul control nethods, nethods.	ation, c , this k	eyword	, overlo	ading	methods
Unit: :	3	Super meth dynar vs. al imple	r classes ods and nic met ostract mentati	and Su l variab hod dis classes,	ib classo bles, Po patch, a definii rough i	es, Memi lymorph abstract ng an in nterface	heritano ber acce ism - d classes iterface, referen	ss rules ynamic and me impler	s, super bindin thods, nenting	keywor g, meth Interfac g interfa	d, fina Iod ov es – I I.ces, a	l classes erriding nterfaces ccessing

U	nit: 4	Exception handling & Multi-threading - Dealing with errors, benefits of exception handling, the classification of exceptions- exception hierarchy, checked exceptions and unchecked exceptions, usage of try, catch, throw, throws and finally, re-throwing exceptions, built in exceptions, creating own exception sub classes. Multi-threading - Differences between multiple processes and multiple threads, creating threads, interrupting threads, thread priorities, daemon threads, thread lifecycle.
U	nit: 5	Database Connectivity –Types of Drivers, Processing SQL statements, DriverManager class, Connection, Statement, ResultSet, PreparedStatement,
		ResultSetMetaData interfaces, Developing CRUDS application using JDBC.
		uation Pattern: It include both internal evaluation (30 marks) comprising two class
		gnments/ quiz/ seminar presentation etc. and external evaluation (70 marks) which
is mainly	end semester	r examination.
Text Boo	oks:	
1 He	rbert schildt, .	lava: the complete reference, 12th edition, 2022, McGraw Hill.
2 Nic	k Samoylov, L	earn Java 17 Programming, 2 nd edition, Packt Publishing Limited.
Reference	e Books:	
1 Kat	hy Sierra, Ber	t Bates, Trisha Gee, Head First Java, 3rd Edition, 2022, O'Reilly
2 Ma	hmoud Parsia	n, JDBC Recipes: A Problem-Solution Approach, Apress

Course Co	ode			(Course	Title			Le	cture	~	
BTCS406	РСТ			Softv	vare En	gineerin	g		L	Т Р		ester:
Version: 1.2			Date				7-11-2022		3	1 0	- 1	V
	Scheme	of Ins	truction					heme of	f Exam	ination		
	Periods		60 Hrs.					М	aximui	m Score	: 10	00
Periods	/ Week	: 4	ł							aluation	: 3	
1	Credits	: 4								emester	: 7	
Instructio		: 1	Lecture					H		uration	_	Hrs.
Prerequisite(orithm					-			
Course Object	,		0									
1. To under		e fun	damental	s of so	ftware	engineer	ring inclu	ding and	alvsis.	design.	constru	ction.
maintena								0	<i>j</i> ,	8,		,
2. To learn a								oles in tl	he dev	elopmer	t of sof	tware
systems.	11 1		1				1 1	L		1		
3. To acquir	e softwa	re req	uirement	t elicita	tion, m	ethods o	f coding a	and testi	ng soft	ware pr	oducts.	
4. To impart												
Course Outco		-				<i>i ^</i>	1 ,		1			
COs No.		/			Statem	ent				Map	ped Pro	ogram
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	softwar				1				1			
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CO ₄								davialan	are a lite		PO ₄ , PO	0
		ina vai	iuate vai	ious so	ftware	prototyp	es and to	uevelop	quant	V	FU4, FU	3
PO ₁ - Engineer investigations of sustainability, P PO ₁ - Life-long	softwar ing Know of complex O ₈ - Ethic	re met vledge, x probl	rics. PO2- Pr ems, PO5-	oblem a	analysis, n tool us	sage, PO ₆ -	esign/dev - The engi	elopment neer and	t of so society	lutions, , PO 7- Er	PO ₄ - C	onduct ent and
investigations of sustainability, P PO ₁₂ - Life-long	softwar ing Know of complex O ₈ - Ethic	re met vledge, x probl s, PO 9-	rics. PO2- Pr ems, PO5- Individua	oblem - Moder l or team	analysis, n tool us 1 work, P	PO ₃ - D sage, PO ₆ - PO ₁₀ - Com	esign/dev - The engi	elopment neer and n, PO 11- Pi	t of so society roject m	lutions, , PO 7- Er	PO ₄ - C	onduct ent and inance,
investigations of sustainability, P PO ₁₂ - Life-long Course	softwar ing Know of complex O ₈ - Ethic	re met vledge, x probl s, PO 9-	rics. PO ₂ - Pr ems, PO ₅ - Individua apping of	oblem - Moder l or team	analysis, n tool us 1 work, P	PO ₃ - D sage, PO ₆ - PO ₁₀ - Com	esign/dev - The engi municatio	elopment neer and n, PO 11- Pi	t of so society roject m	lutions, , PO ₇ - Er nanageme	PO ₄ - C	onduct ent and inance, PO 1
investigations of sustainability, P PO ₁₂ - Life-long Course Outcomes	softwar ing Know of comple: O ₈ - Ethic Learning PO ₁	e metr vledge, x probl s, PO ₉ - Ma PO ₂	rics. PO ₂ - Pr ems, PO ₅ - Individua apping of	oblem a - Modern l or team	analysis, n tool us 1 work, P e outcor	\mathbf{PO}_{3} - D sage, \mathbf{PO}_{6} - \mathbf{PO}_{10} - Com mes with	esign/dev - The engi munication program	elopment neer and n, PO ₁₁ - Pi	of so society roject m	lutions, , PO 7- Er nanageme	PO₄ - Co vironme ent and fi	onduct ent and nance,
investigations of sustainability, P PO ₁₂ - Life-long Course Outcomes CO ₁	softwar ing Know of comple: O 8- Ethic Learning	re metr vledge, x probl s, PO 9- <u>Ma</u>	rics. PO ₂ - Pr ems, PO ₅ - Individua apping of PO ₃	oblem a - Modern l or team	analysis, n tool us 1 work, P e outcor	\mathbf{PO}_{3} - D sage, \mathbf{PO}_{6} - \mathbf{PO}_{10} - Com mes with	esign/dev - The engi municatio program	elopment neer and n, PO ₁₁ - Pi	of so society roject m	lutions, , PO 7- Er nanageme	PO₄ - Co vironme ent and fi	onduct ent and inance, PO 1
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investigations c sustainability, P PO ₁₂ - Life-long Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄	softwar ing Know of comple: O ₈ - Ethic Learning PO ₁ 2	e metr vledge, x probl s, PO ₉ - Ma PO ₂	rics. PO ₂ - Pr ems, PO ₅ - Individua apping of PO ₃ 2 2	roblem : - Modern l or team PO ₄	analysis, n tool us n work, F e outcor PO 5	PO ₃ - D sage, PO ₆ - PO ₁₀ - Com mes with PO ₆	esign/dev - The engi municatio program	elopment neer and n, PO ₁₁ - Pr outcom PO ₈	es	lutions, , PO 7- Er nanageme	PO₄ - Co vironme ent and fi	onduct ent and inance, PO 1
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Unit: 4	Coding and Testing: Choice of Programming languages, Coding standards for Software. User Interface Design: Concepts of Ui, Interface Design Model, Internal and External Design, Evaluation, Interaction and Information Display Testing Objectives, Unit Testing, Integration Testing, Acceptance Testing, Regression Testing, Testing for Functionality and Testing for Performance, Top- Down and Bottom-Up Testing.
	Configuration Management: Concepts in Configuration Management, The
	Configuration Management Process: Planning and Setting up Configuration
	Management, Perform Configuration Control, Status Monitoring and Audits.
Unit: 5	Software Maintenance: What is software maintenance, Maintenance Process &
	Models, Reverse Engineering, Software re-engineering, Configuration
	Management issues and concept, Configuration planning & techniques,
	Software versions and change control process, Documentation.
Examination and Eval	luation Pattern: It include both internal evaluation (30 marks) comprising two class
sessional exams/ assig	gnments/ quiz/ seminar presentation etc. and external evaluation (70 marks) which
is mainly end semeste	r examination.
Text Books:	
1 R. Pressman, "So	ftware Engineering", 7th Edition, 2010, McGraw-Hill.
2 Yogesh Singh "Se	oftware Engineering", 3 rd Edition, 2007, New Age Publications, Delhi.
Reference Books:	

W.S. Jawadekar, "Software Engineering", 2008, A Primer, TMH. 1

Shari Pfleeger, "Software Engineering", 2010, Pearson Education.
 Stephen Schach, "Software Engineering", 2007, TMH.

Course C					Course					ectur		Sem	ester:
BTCS407	РСТ		F :			thematic			L	T	P		V
Version: 1.2	~ 1				oval: 16	th BoS 1	7-11-2022	-	3	1	0		
	Scheme						S	heme of				10	0
	Periods		Hrs.						aximu			: 10	
Periods	/ Week	: 4							nal Ev			: 30	
.	Credits	: 4							End S			: 70	
Instructio			cture					E	xam l	Jurat	ion	: 31	Irs.
Prerequisite		eering	Mathen	natics-l	11								
Course Object 1. To unde			C			1	ures by fo			<u> </u>			
objects, 4 2. To devel to analyz 3. To impa Trees, an	operatior op forma zing and v rt the co nd Planar	ns, and i l logical writing oncept of Graphs	resultin reason proofs, of relati s.	g prope ing tecl technic on thro	erties. hniques ques for ough va	and not countin rious re	ation and g, permu presentat	demons tations a ions of (trate nd co Graph	the aj mbina s, DF	oplic ation S, Bl	ation o s FS, Spa	f logio
							ions, ison		n and	sub g	raph	s, mult	i
<u> </u>			, Hamil	tonian ;	graphs,	Chroma	tic Numb	ers.					
Course Outc	omes (CC	D):											
COs No.	-				Statem			_			Out	ped Pro	(POs)
CO ₁	Underst equivale quantifi	ence i	Vell-for mplicat		formul Jormal	as, Tr forms,	uth Tal Quanti		utolo§ nivers			PO ₁ , PO	2
CO ₂	and res	ulting p	roperti	es.	·		ical obje	-				PO ₂ , PO	3
CO ₃	techniq	e the application of logic to analyzing and writing proofs, ues for counting, permutations and combinations										PO ₃	
CO ₄							anning Ti ng applic		l Plan	ar		PO ₃ , PO	5
investigations sustainability, PO ₁₂ - Life-long Course	PO ₈ - Ethic	cs, PO 9- 1	ndividua	al or tear	n work, I	PO 10- Con		n, PO 11- P	roject				
Outcomes	PO ₁	PO ₂	PO ₃	PO ₄	PO ₅	PO ₆	PO ₇	PO ₈	PO) P	O ₁₀	PO ₁₁	2
CO ₁	2	1	0										<u> </u>
		1	2										──
CO ₃			2										<u> </u>
CO ₄			2		1		_						
			1 – R	easona	ble; 2 –	Significo	ınt; 3 – St	rong					
Detailed Cor		formu Quant variab	llas, Ti tifiers, t	ruth T univers les of	ables, † al quan	tautolog tifiers. I	and not y, equiva Predicates sistency,	lence ir s: Predic	nplica ative	tion, logic	Noi , Fre	rmal f ee & B	orms, ound
Unit: :	2	Relati compa Invers	ons: P atibility se Func	roperti and pa tion, Co	artial or omposit	dering r tion of fu	Relations, elations, inctions, ind its app	Lattices, recursiv	Hass	e dia	gram	. Func	tions
Unit: 3	3	Eleme with r	entary (C ombin ons, C	atorics onstraiı	: Basics ned rep	of count oetitions, ciples of I	ing, Con Binomi	al C	oeffic	eient		
Unit: 4	4	Recur Coeffi	rence I cients (Relation of gene	ns: Gene erating	erating F	unctions s, Recuri	Functio ence re	n of S lation	equei s, sol	nces. ving	recur	rence

Exami		Graph Theory: Representation of Graphs, DFS, BFS, Spanning Trees, Planar Graphs. Graph Theory and Applications, Basic Concepts, Isomorphism and Sub graphs, Multi graphs and Euler circuits, Hamiltonian graphs, Chromatic Numbers. uation Pattern: It include both internal evaluation (30 marks) comprising two class gnments/ quiz/ seminar presentation etc. and external evaluation (70 marks) which
	nly end semeste	
Text B		
1 N	Aathematical Fo	undation of Computer Science – Shahnaz Bathul, PHI.
2 E	Elements of	Discrete Mathematics- A Computer Oriented Approach, C.L.Liu, D.P.
N	/Iohapatra,3edit	ion,TMH.
		natics for Computer Scientists & Mathematicians, second edition, J.L.Mott, A.
	Kandel, T.P. Bake	
		nbinatorial Mathematics- An Applied Introduction-5th Edition– Ralph. P.Grimaldi,
	Pearson Educati	on
Refere	ence Books:	
1 D	Discrete Mathen	natics and its applications, 6th edition, K.H. Rosen, TMH.
2 D	Discrete Mathen	natical Structures, Mallik and Sen, Cengage Learning
3 D	Discrete Mather	natical Structures, Bernand Kolman, Robert C. Busby, Sharon Cutler Ross, PHI/
Р	Pearson Educati	on
4 D	Discrete Mathen	natics with Applications, Thomas Koshy, Elsevier.
5 L	ogic and Discre	te Mathematics, Grass Man and Tremblay, Pearson Education

Course C					Course	Title			Lee	cture	Som	ester
BTCS451F	РСР						ems LAB		L	Т Р		V
Version: 1.2					·oval: 16	th BoS 1	7-11-2022		0	0 4	1	v
	Scheme	of Ins	truction				Sc	heme of	Exami	ination		
No. of	Periods	: 6	60 Hrs.					M	aximur	n Score	: 10	00
Periods	/ Week	: 4	Į					Inter	nal Eva	luation	: 5	0
	Credits	: 2	2						End Se	emester	: 5	0
Instructio	n Mode	: I	Practical					F	lxam D	uration	: 3	Hrs.
Prerequisite(ase M	anageme	ent Syst	ems							
Course Objec												
 To acquir To under with vary To handle controllir To write 	stand the ing skill l e differen ng concur programi	e conc evels. t user rrent u me by	ept of da views of updates s	ata plan the san so as to	ning an ne store mainta	id databa ed data, c	ase desigr ombining	for serv	ving dif			
Course Outco	omes (CO):										
COs No.					Statem	ent					ped Pro	
											comes	(POs)
CO ₁	relation includin	al alge ng the	ebra exp E-R met	ression: hod and	s for qu 1 norma	eries, log lization	r, and be gical desig approach	gn of dat	abases	,	PO ₃	
CO_2	Illustrat	e com	mercial	relatior	al datal	base syst	em by wr	iting SQ	L.		PO ₃ , PO	5
CO ₃			atabase s				organiza				D2, PO6, I PO3, PO	
			0	tree, ha	ashing,	query ev	aluation	techniqu	ies and	1		
investigations o sustainability, F	of complex PO 8- Ethics	/ledge, k probl	PO 2- P1 ems, PO 5-	- Moder	n tool us	sage, PO ₆ -	- The engi	neer and	society,	PO ₇ - Env	vironme	ent an
nvestigations o sustainability, F	ing Know of complex O 8- Ethics	vledge, k probl s, PO 9-	PO 2- P1 ems, PO 5 ⁻ Individua	- Moder l or tean	n tool us 1 work, P	sage, PO 6- O 10- Com	- The engin munication	neer and n, PO 11- P1	society, roject m	PO ₇ - Env	vironme	ent an
nvestigations o sustainability, F ? O 12- Life-long	ing Know of complex O 8- Ethics	vledge, k probl s, PO 9-	PO 2- P1 ems, PO 5 ⁻ Individua	- Moder l or tean f course	n tool us 1 work, P	sage, PO 6- O 10- Com	- The engi	neer and n, PO 11- P1	society, roject m	PO ₇ - Env	vironme	ent an inance
nvestigations of sustainability, F PO ₁₂ - Life-long Course	ing Know of complex O 8- Ethics	vledge, k probl s, PO 9-	PO 2- P1 ems, PO 5 ⁻ Individua	- Moder l or tean	n tool us 1 work, P	sage, PO 6- O 10- Com	- The engin munication	neer and n, PO 11- P1	society, roject m	PO ₇ - Env	vironme	ent an inance PC
nvestigations of sustainability, F 2012- Life-long Course Outcomes	ing Know of complex O ₈ - Ethics Learning	vledge, k probl s, PO 9- Ma	PO ₂ - Pi ems, PO ₅ Individua apping of PO ₃	- Moder l or tean f course	n tool us n work, P e outcor	sage, PO 6- O 10- Com nes with	- The engin munication program	neer and n, PO 11- P1 outcom	society, roject m es	PO7- Env anagemen	vironme nt and fi	ent an inance
nvestigations of sustainability, F PO ₁₂ - Life-long Course Outcomes CO ₁	ing Know of complex O ₈ - Ethics Learning	vledge, k probl s, PO 9- Ma	PO ₂ - P1 ems, PO ₅ . Individua apping of PO ₃ 2	- Moder l or tean f course	n tool us work, P e outcor PO ₅	sage, PO 6- O 10- Com nes with	- The engin munication program	neer and n, PO 11- P1 outcom	society, roject m es	PO7- Env anagemen	vironme nt and fi	ent an inance PC
nvestigations of sustainability, F PO ₁₂ - Life-long Course Outcomes CO ₁ CO ₂	ing Know of complex O ₈ - Ethics Learning	/ledge, k probl s, PO 9- Ma PO 2	PO ₂ - Pi ems, PO ₅ Individua apping of PO ₃	- Moder l or tean f course	n tool us n work, P e outcor	age, PO ₆ . O₁− Com nes with PO ₆	- The engin munication program	neer and n, PO 11- P1 outcom	society, roject m es PO ₉	PO7- Env anagemen	vironme nt and fi	ent an inance PC
nvestigations of sustainability, F PO12- Life-long Course Outcomes CO1 CO2 CO3	ing Know of complex O ₈ - Ethics Learning	vledge, k probl s, PO 9- Ma	PO ₂ - PI ems, PO ₅ . Individua apping of PO ₃ 2 2	- Moder l or tean f course	n tool us work, P outcor PO 5	sage, PO 6- O 10- Com nes with	- The engin munication program	neer and n, PO 11- P1 outcom	society, roject m es	PO7- Env anagemen	vironme nt and fi	ent an inance PC
nvestigations of sustainability, F PO ₁₂ - Life-long Course Outcomes CO ₁ CO ₂	ing Know of complex O ₈ - Ethics Learning	/ledge, k probl s, PO 9- Ma PO 2	PO ₂ - PI ems, PO ₅ : Individua apping of PO ₃ 2 2 3	- Moder l or tean f course PO 4	n tool us n work, P e outcor PO ₅ 2 2 2	PO ₆ - Com PO ₁₀ - Com PO ₆ 2	- The engin munication program PO ₇	outcom PO ₈	society, roject m es PO ₉	PO7- Env anagemen	vironme nt and fi	ent an inance PC
nvestigations of sustainability, F PO ₁₂ - Life-long Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Cont	PO1 PO1 PO1 PO1 PO1 PO1 PO1 PO1 PO1 PO1	/ledge, k probl s, PO 9- Ma PO 2 2	PO ₂ - Pr ems, PO ₅ : Individua apping of PO ₃ 2 2 2 3 1 - R	- Moder l or tean f course PO4 easonal	e outcor PO5 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	res with PO ₆ 2 Significa	- The engin munication program PO7 nt; 3 – Str	outcom PO ₈	society, roject m es PO ₉	PO7- Env anagemen	vironme nt and fi	ent an inance PC
Outcomes CO1 CO2 CO3	PO1 PO1 PO1 PO1 PO1 PO1 PO1 PO1 PO1 PO1	r Data sing lo sing schar sing schar sing schar or relat or sub o y the us	PO ₂ - PI ems, PO ₅ : Individua apping of PO ₃ 2 2 2 3 1 - R Definition gical oper QL operator racter, nui ional alge acting dat queries, n se of PL/S	- Moder l or tean f course PO4 easonal easonal ations (= ors mber, da bra a from n ested qu SQL	n tool us n work, P e outcor PO5 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	roup fund none tabl	- The engineration program PO7 nt; 3 – Sta anguage	outcom PO ₈	society, roject m es PO ₉	PO7- Env anagemen	vironme nt and fi	ent an inance PO
Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Cont Norite SQL Write SQL Concepts 1 Concepts 1	PO1 PO1 PO1 PO1 PO1 PO1 PO1 PO1 PO1 PO1	r Data sing lo sing SC ng cha or relat or sub o y the us 3ACK, 0 SORS a REPOR	PO2- PI ems, PO5- Individua apping of PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO5 PO5 PO5 PO5 PO5 PO5 PO5 PO5 PO5 PO5	- Moder l or tean f course PO4 easonal easonal ations (= ors mber, da bra a from n ested qu SQL & CHEC ERS & w	n tool us n work, P e outcor PO5 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	sage, PO ₆ - PO ₁₀ - Com nes with PO ₆ 2 Significa ulation La .) group fund n one tabl	- The engin munication program PO7 nt; 3 – Sta anguage ctions e	PO ₈	society, roject m es PO ₉	PO ₇ - Env anagement PO ₁₀	PO ₁₁	PRC 2
Course Outcomes CO ₁ CO ₂ CO ₂ CO ₃ CO ₄ Detailed Cont Write the C Write SQL Write SQL Concepts 1 Concepts 1 Concepts 1 Create FO Examination at exams/ assignt	PO1 PO1 PO1 PO1 PO1 PO1 PO1 PO1 PO1 PO1	PO2 Ma PO2 PO2 2 r Data sing lo sing SC ng cha or relat or extra or sub o y the us 3ACK, 0 SORS a REPOR tion P	PO2- PI ems, PO5- Individua apping of PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO5 PO5 PO5 PO5 PO5 PO5 PO5 PO5 PO5 PO5	- Moder l or tean f course PO4 PO4 easonal easonal ations (= ors mber, da bra a from n ested qu SQL & CHEC EERS & w	n tool us n work, P e outcor PO5 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	ronge, PO ₆ - PO ₁₀ - Com PO ₆ 2 Significa ulation La .) group function s ERTIONS	- The engin munication program PO7 nt; 3 – Sta anguage ctions e	PO ₁₁ - Pr outcom PO ₈ Fong	society, roject m es PO ₉	PO ₇ - Env anagement PO ₁₀	PO ₁₁	PO 2
Course Outcomes CO ₁ CO ₂ CO ₂ CO ₃ CO ₄ Detailed Cont Write the C Write SQL Write SQL Writ	PO1 PO1 PO1 PO1 PO1 PO1 PO1 PO1 PO1 PO1	PO2 Ma PO2 2 2 r Data sing lo sing SC ng cha or relat or relat or sub o y the u 3ACK, o SORS a REPOR tion P iz/ ser	PO2- PI ems, PO3- Individua apping of PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3	- Moder l or team f course PO4 PO4 easonal easonal ations (= ors mber, da bra a from n ested qu SQL & CHEC WERS & w include sentation	n tool us n work, P e outcor PO5 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	roup function Lability of the second	- The engin munication program PO7 nt; 3 – Sta nguage ctions e	PO ₁₁ - Pr outcom PO ₈ Fong	society, roject m es PO ₉	PO ₇ - Env anagement PO ₁₀	PO ₁₁	PRO PO 2
Novestigations of sustainability, F PO12- Life-long Course Outcomes CO1 CO2 CO3 CO4 Detailed Conf L. Write the 0 2. Write SQL 3. Write SQL 4. Write SQL 5. Write SQL 6. Write SQL 7. Write SQL 8. Write SQL 9. Concepts 1 10. Create VIE 11 Fundame	PO1 PO1 PO1 PO1 PO1 PO1 PO1 PO1 PO1 PO1	PO2 Ma PO2 2 2 2 7 Data sing lo sing SC ng cha or relat or extra or sub of y the us BACK, of SORS a REPOR tion P iz/ ser	PO ₂ - PI ems, PO ₅ - Individua apping of PO ₃ 2 2 2 3 1 - R Definition gical oper tracter, nu ional alge acting dat queries, n se of PL/S COMMIT nd TRIGG TS attern: It ninar pres	- Moder l or team f course PO4 easonal easonal ations (= ors mber, da bra a from n ested qu SQL & CHEC WERS & w include sentation	n tool us n work, P e outcor PO5 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	sage, PO ₆ - PO ₁₀ - Com nes with PO ₆ 2 Significa ulation La .) group fund n one tabl S ERTIONS ternal eva d external	- The engin munication program PO7 nt; 3 – Sta anguage ctions e	PO ₁₁ - Pr outcom PO ₈ Fong	society, roject m es PO ₉	PO ₇ - Env anagement PO ₁₀	PO ₁₁	PRO PO 2
nvestigations of sustainability, F Sustainability, F Out Life-long Outcomes Outcomes CO1 CO2 CO3 CO4 Detailed Cont 0. Write SQL 3. Write SQL 4. Write SQL 5. Write SQL 6. Write SQL 7. Write SQL 8. Write SQL 9. Concepts 10 10. Create VIE 11. Create FO2 Examination. Text Books: 11 Fundame 2	PO1 PO1 PO1 PO1 PO1 PO1 PO1 PO1 PO1 PO1	PO2 Ma PO2 2 2 2 7 Data sing lo sing SC ng cha or relat or extra or sub of y the us BACK, of SORS a REPOR tion P iz/ ser	PO ₂ - PI ems, PO ₅ - Individua apping of PO ₃ 2 2 2 3 1 - R Definition gical oper tracter, nu ional alge acting dat queries, n se of PL/S COMMIT nd TRIGG TS attern: It ninar pres	- Moder l or team f course PO4 easonal easonal ations (= ors mber, da bra a from n ested qu SQL & CHEC WERS & w include sentation	n tool us n work, P e outcor PO5 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	sage, PO ₆ - PO ₁₀ - Com nes with PO ₆ 2 Significa ulation La .) group fund n one tabl S ERTIONS ternal eva d external	- The engin munication program PO7 nt; 3 – Sta anguage ctions e	PO ₁₁ - Pr outcom PO ₈ Fong	society, roject m es PO ₉	PO ₇ - Env anagement PO ₁₀	PO ₁₁	PC 2
nvestigations of sustainability, F Sustainability, F Out Life-long Outcomes Outcomes CO1 CO2 CO3 CO4 Detailed Cond 2. Write SQL 3. Write SQL 4. Write SQL 5. Write SQL 5. Write SQL 6. Write SQL 7. Write SQL 8. Write SQL 9. Concepts 10. Create VIE 1. Create FO Examination are exams/ assignmentation. Fext Books: 1 Fundame 2 Introduct Reference Bo	PO1 PO1 PO1 PO1 PO1 PO1 PO1 PO1 PO1 PO1	r Data sing lo y the us atabase	PO ₂ - PI ems, PO ₅ - Individua apping of PO ₃ 2 2 2 3 1 - R Definition gical oper acting dat queries, n se of PL/S COMMIT nd TRIGC TS attern: It ninar pres	- Moder l or tean f course PO4 easonal easonal a and Dat ations (= ors mber, da bra a from n ested qu SQL & CHEC ERS & w include sentation , Elmasri C.J.Date	n tool us n work, P e outcor PO ₅ 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	sage, PO ₆ - PO ₁₀ - Com mes with PO ₆ 2 Significa ulation La ulation La c) group fund n one tabl S ERTIONS ternal eva d external e Pearson Educatio	- The engin munication program PO7 nt; 3 – Sta anguage ctions e	POs POs POs Omarks) (50 marks)	society, roject m es PO ₉ 1	PO ₇ - Envanagement PO ₁₀	vironment and fi	PC 2

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Course	Code			(Course	Title			L	ectu	re	0	
BTCS452	2PCP			Opera	ating Sy	stems LA	AB		L	Т	Р	Sei	nester:
Version: 1.2			Date	-	0 1		7-11-2022		0	0	4		IV
	Scheme	of Inst						heme of	Exar	ninat	ion		
No. o	f Periods		0 Hrs.							ım So		:	100
	s/Week	: 4						Inter					50
	Credits	: 2								Seme			50
Instructi	on Mode		ractical							Dura			3 Hrs.
Prerequisite								L	Aum	Duru	cion	• •	5 111 5.
Course Obje	() 1	iting b.	Stems										
J	e program	s in Lir	ux envir	ronmen	t using	system c	alls						
	ement the					system e	ano.						
						ems usin	g semaph	ores					
	rt the kno							0105.					
Course Outo		0		Jiguinze		ennquee							
COs No.		<i>.</i>			Statem	ent					Manr	ed Pi	rogran
005110.					Statem	CIIC							s (POs)
CO ₁	Under	stand th	e conce	pt of Li	nux env	vironmen	nt					PO ₁	()
CO ₂				1			alls in UN	IX			1	PO ₃ , P	05
CO ₃							ween two		es		-	PO ₅	
CO ₄	-		lve sync					process				PO ₃ , P	
PO ₁ - Enginee							agign (daw	lonmont	of	alutic		,	
investigations sustainability, PO 12- Life-lon	PO ₈ - Ethio	es, PO 9-											
	g Learning												
	g Learning		pping of	f course	outcor	nes with	program	outcom	es				
Course		Ma										ЪО	PO
	PO:		pping of PO ₃	f course	e outcor PO ₅	nes with PO ₆	program PO ₇	outcome PO ₈	es PO	9]	PO ₁₀	PO ₁	PO
Course	PO:	Ma								9]	P O 10	PO ₁	L
Course Outcomes	PO ₁	Ma								9]	PO ₁₀	PO	L
Course Outcomes CO ₁	PO ₁	Ma	PO ₃		PO ₅					9]	PO ₁₀	PO	L
Course Outcomes CO ₁ CO ₂	PO ₁	Ma	PO ₃		PO ₅					9]	PO ₁₀	PO	L
Course Outcomes CO ₁ CO ₂ CO ₃	PO ₁	Ma	PO ₃	PO ₄	PO ₅	PO ₆		PO ₈	PO	9]	PO ₁₀	POt	L
Course Outcomes CO1 CO2 CO3	PO ₁ 2	Ma	PO ₃	PO ₄	PO ₅	PO ₆	PO ₇	PO ₈	PO	9	PO ₁₀	PO	L
Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Con	PO ₁ 2	Ma PO ₂	PO ₃ 2 2 1 - R	PO ₄	PO ₅	PO ₆	PO ₇	PO ₈	PO	99]	PO ₁₀	POt	L
Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Con 1. Basics o	PO1 2 intents: f UNIX cc	Ma PO2	PO ₃ 2 2 1 - R	PO ₄	PO ₅	PO ₆	PO ₇	PO ₈	PO	9	PO ₁₀	POt	L
Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Con 1. Basics o 2. Shell pro	PO1 2 intents: f UNIX cc ogrammin	Ma PO2	PO3 2 2 1 - R ds	PO ₄	PO ₅	PO ₆	PO ₇	PO ₈	PO		PO ₁₀	PO	L
Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Con 1. Basics o 2. Shell pro 3. Implement	PO1 2 intents: f UNIX cc ogrammin	Ma PO2 mmana ng of CPU	PO3 2 2 1 - R is scheduli	PO4 easonab	PO ₅	PO ₆	PO ₇	PO ₈	PO		PO ₁₀	PO	L
Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Con 1. Basics o 2. Shell pro 3. Implemed 4. Implemed	PO1 2 ntents: f UNIX cc ogrammin entation o ent all file	Ma PO2 PO2 Mman ag of CPU allocat	PO3 2 2 1 - R is scheduli	PO4 easonab	PO ₅	PO ₆	PO ₇	PO ₈	PO		PO10	PO	L
Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Con 1. Basics o 2. Shell pro 3. Implemo 4. Implemo 5. Implemo	PO1 2 ntents: f UNIX cc ogrammin entation c ent all file ent Sema	Ma PO2 PO2 mman ng of CPU allocat	PO ₃ 2 2 1 - Ro ds scheduli ion strat	PO4 easonab	PO ₅ 2 2 ble; 2 - 5 ound Re	PO ₆	PO ₇	PO ₈	PO		PO ₁₀	PO	L
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- dynamic binding,
- differentiating method,
- overloading method and,
- overriding method.
- 8. Write a java program to perform the following inheritance:
 - I. Single
 - II. Multi-level
 - III. Hierarchical
- 9. Write the following java programs:
 - I. Write a java program to operate super keyword in java.
 - II. Write a java program to demonstrate the final method.

10. Write the following java programs:

- I. Write a java program to define and implement an interface
- II. Write a java program to implement Interface using extends keyword
- 11. Write a java program to demonstrate this keyword
- Write a java program to demonstrate this () method.
- 12. Write a java program to create user defined package.
- 13. Write a java program to demonstrate.
 - I. Constructor
 - II. Default constructor
 - III. Copy constructor
- Q 14. Write the following java programs:
 - i. Method overloading
 - ii. Constructor overloading
- 15 a.) Develop a Java application to generate Electricity bill. Create a class with the following members:
 - Consumer no.
 - consumer name
 - previous month reading
 - current month reading
 - type of EB connection (domestic or commercial).

b.) Compute the bill amount using the following tariff. If the type of the EB connection is domestic, calculate the amount to be paid as follows:

- First 100 units Rs. 1 per unit
- 101-200 units Rs. 2.50 per unit
- 201 -500 units Rs. 4 per unit
- >= 501 units Rs. 6 per unit

If the type of the EB connection is commercial, calculate the amount to be paid as follows:

- First 100 units Rs. 2 per unit
- 101-200 units Rs. 4.50 per unit
- 201 -500 units Rs. 6 per unit
- >= 501 units Rs. 7 per unit

16. I.) Develop a java application with a class Employee which consist:

- Emp Name
- Em Id
- Address
- E-Mail id
- Mobile no. as members.

ii.) Inherit the classes Programmer

- Assistant Professor,
- Associate Professor and
- Professor from employee class.
- iii.) Add Basic Pay (BP) as the member of all the inherited classes with
 - 97% of BP as DA,
 - 10 % of BP as HRA,
 - 12% of BP as PF,
 - 0.1% of BP for staff club fund.
- Generate pay slips for the employees with their gross and net salary.

17. Write a Java Program to create an abstract class named Shape that contains two integers and an empty method named print Area ().

- Provide three classes named Rectangle, Triangle and Circle such that each one of the classes extends the class Shape.
- Each one of the classes contains only the method print Area () that prints the area of the given shape.

18. Write the following java programs:

- I. Write a Java Program to describe about try and catch blocks for handling exceptions
- II. Write a Java Program to demonstrate about throw and throws keywords
- III. Write a Java program to implement user defined exception handling

19. Write a Java Program to demonstrate String Buffer Class and String Builder Class 20. Write a Java Program to perform the following operations:

- I. To create threads in java by extending Thread Class
- II. To create threads in java by implementing Runnable Interface
- 21. Write a java program that connects to a database using JDBC and perform the following:
 - i. add record.
 - ii. delete record.
 - iii. modify record.
 - iv. Retrieve record.

Examination and Evaluation Pattern: It include both internal evaluation (50 marks) comprising two class sessional exams/ assignments/ quiz/ seminar presentation etc. and external evaluation (50 marks) which is mainly end semester examination.

Text Books:

1 Java; the complete reference, 9th editon, Herbert schildt, TMH.

2 Understanding OOP with Java, updated edition, T. Budd, Pearson education.

Reference Books:

1 Programming with java , E Balagurusamy, McGraw-Hill; Sixth edition (25 March 2019);

2 Introduction to OOP, second edition, T. Budd, pearson education.

Course Co	ode				Course	Title			Le	cture	Som	ester:
BTCS511P	СТ			Comp	uter Or	ganizatio	on		L	Т Р		V
Version: 1.2			Date	of Appr	oval: 16	th BoS 17	7-11-2022		3	1 0		v
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CO ₃	^		nalyze	differe	nt inte	rrupts, l	/O tech	niques,	PLDs		PO ₃	
	and me	emory	organi	zation.								
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sustainability, P PO ₁₂ - Life-long Course	Learning	Maj	oping of	f course	e outcor	nes with	program	outcom	es			PO 1
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CO4			2	2								1
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Detailed Com			1 - K	eusonul	ne, 2 - 2	siynijicu	nı, 5 - Sı	ong				
Detailed Cont	151113.						re of con	puter F	unctio	nal com	onent	s of a
Unit: 1		Comp Comp	outer O	rganiza ⁄ith ins	tion an	d Archit	mponent ecture B Basic Cor	s, Perfo asic stru	ormano icture	ce of a of Gene	i comp eral pu	outer. rpose
Unit: 1 Unit: 2		Comp Comp Organ Regis Langu Micro Subtr	outer O outer w <u>nization</u> ters Mi nage, I ooperati actor, A	rganiza /ith ins croope Register ons, I rithmet	tion an struction rations Tran Logic	d Archit n set, E and Ari sfer, B Microop c Shift U	ecture B Basic Con thmetic us and erations, nit.	s, Perfo asic stru nputer Logic St Memon Shift	ormano icture and ructur ry Tr Micro	ce of a of Gene registers e: Regis ansfers, operatio	eral pu eral pu s, Harc ter Tra Arith ons, A	outer. rpose lware insfer metic dder-
		Comp Comp Organ Regis Langu Micro Subtr CPU Organ Manij	outer O outer w nization ters Mi nage, I ooperati actor, A Organ nization oulation	rganiza /ith ins crooper Register ons, I <u>rithmet</u> ization: , Instr , Progra	tion an atruction rations Tran Logic Logic Intro uction am Con	d Archit n set, F and Ari sfer, B Microop <u>c Shift Us</u> duction, Formats trol Orga	ecture B Basic Con thmetic us and erations,	s, Perfo asic stru nputer Logic St Memon Shift shift I Regis ssing M of a c	ormano acture and ructur ry Tr Micro ster (odes, ontrol	ce of a of Gene registers e: Regis ansfers, operatio Drganiza Data T unit-Op	ter Tra Arith ns, A tion, ransfer peration	buter. rpose lware unsfer metic dder- Stack and ns of

	Unit: 5	Memory Organization: Memory Hierarchy, Main Memory, Auxiliary Memory, Associative Memory, Cache Memory, Virtual Memory, Memory Management Hardware
		uation Pattern: It include both internal evaluation (30 marks) comprising two class
sess	ional exams/ assig	nments/ quiz/ seminar presentation etc. and external evaluation (70 marks) which
is m	ainly end semeste	r examination.
Text	Books:	
1	Computer Syster	ns Architecture – M.Moris Mano, IIIrd Edition, Pearson/PHI
2	Computer Organ	ization and Architecture–William Stallings Sixth Edition, Pearson/PHI
Refe	erence Books:	
1	Computer Orgar	ization - Carl Hamacher, Zvonks Vranesic, SafeaZaky, Vth Edition, McGraw Hill
2	Structured Comp	outer Organization – Andrew S. Tanenbaum, 4th Edition PHI/Pearson
3	Fundamentals of	Computer Organization and Design, -Sivaraama Dandamudi Springer Int.
	Edition.	
4	Computer Archi	tecture a quantitative approach, John L. Hennessy and David A. Patterson,
	Fourth Edition E	sevier
5	Computer Archit	ecture: Fundamentals and principles of Computer Design, Joseph D. Dumas II, BS
	Publication	

Course C					ourse T				Lect	ure		
BTCS5121	РСТ					utomata			L	T P	Sem	ester: V
Version: 1.2					val: 16t	h BoS 17-			3	1 0		
	Scheme								of Exan			
	Periods) Hrs.						laximum		:	100
Periods	/ Week	: 4						Inte	rnal Eva		:	30
.	Credits	: 4							End Se		:	70
Instructio			ecture						Exam Dı	iration	:	3 Hrs.
Prerequisite Course Object		ete Mat	hematic	es								
 To unde grammar machine. To explai science, To acquir 	, finite an n the bas e.g., comp re insight	utomat sic mod pilers, s s into t	on, regu els of co oftware he relat	ular exp omputa e engine ionship	tion incering, control	n, formal cluding t concurre formal l	langua he foun nt syste anguag	ge, pusl dation c ems, etc	hdown a of many i	utomat branche	on and	Turing
4. To impar	t the kno	wledge	of Chor	msky hi	erarchy	of langu	ages.					
Course Outco	omes (CO):										
COs No.				S	Stateme	nt						ogram
			1 .			1 .		C		Out	comes	<u>, </u>
CO ₁		ng dete	rministi	c (DFA)		abstract letermin					PO ₁ , PC) ₂
CO_2						of regu					PO ₂ , PO	D ₃
						d contex						
CO ₃		ng regu	ılar, coı	ntext-fi	ree, coi	s betwe ntext-se					PO ₃ , PC) 4
CO ₄						tools and	l formal	metho	ds		PO ₃ , PO) ₄
investigations sustainability, I PO ₁₂ - Life-long	O8- Ethics	s, PO 9- I	ndividua	l or team	n work, P	O ₁₀ - Com	municat	ion, PO11-	- Project r	nanagem	ent and	l finance,
Course Outcomes	PO ₁	PO ₂	PO ₃	PO ₄	PO ₅	PO ₆	PO ₇	PO ₈	PO ₉	PO ₁₀	PO ₁₁	PO ₁₂
<u>CO1</u>	2	2										
		2	2	0								
CO ₃			3	2								
CO ₄			2	-	10	1		14				
Detailed Car			I - K	easonal	ne; 2 – 3	Significa	nt; 5 - 2	strong				
Detailed Con		Deter transi Autor and D	ministic tion gr nata (NF PFA, Min	e finite aph, T FA), NFA imizatio	Automa ransitio with e on of Fir	ita (DFA) n table, psilon tra nite Auto	-Forma Langu ansition mata.	l Definit age of , Langua	s; Autor tion, Sim DFA, N age of NI	plified ondeter FA, Equi	notatio ministi valence	n: State c finite e of NFA
Unit: 2	2	prece expre Langu Closu	dence, ssion to lages, Po re propo ith outp	Algebra o FA, l umping erties of	aic laws DFA to Lemma f Regula	for Regular Regular for regu r Langua	gular e: • expre lar Lang ges, De	xpressio ssion, <i>A</i> guages. A cision p	regular ns, Klee Arden Tl Application roperties ivalence	n's The neorem, on of Pu s of Regu	orem, Non mping ılar Lar	Regular Regular Lemma nguages
		Conte					Conte		Langua	ges (CI	L): De	finition

	Unit: 4	Push Down Automata (PDA): Description and definition, Instantaneous Description, Language of PDA, Acceptance by Final state, Acceptance by empty stack, Deterministic PDA, Equivalence of PDA and CFG, CFG to PDA and PDA to CFG, Two stack PDA.
	Unit: 5	Turing machines (TM): Basic model, definition and representation, Instantaneous Description, Language acceptance by TM, Variants of Turing Machine, Universal TM, Church's Thesis, Chomsky hierarchy of languages, Recursive and recursively enumerable languages, Halting problem, Undecidable problems about TMs. Post correspondence problem (PCP).
Exa	mination and Eval	uation Pattern: It include both internal evaluation (30 marks) comprising two class
sess	ional exams/ assig	nments/ quiz/ seminar presentation etc. and external evaluation (70 marks) which
is m	ainly end semester	examination.
Tex	t Books:	
1		Automata Theory Languages and Computation". Hopcroft H.E. and Ullman J. D.
	Pearson Education	on
2		mputer Science: Automata, Languages and Computation, K.L.P.Mishra,
	N.Chandrasekara	n
Refe	erence Books:	
1	Introduction to C	Computer Theory, Daniel I.A. Cohen, John Wiley
2	Introduction to la	anguages and the Theory of Computation ,John C Martin, TMH
3	Elements of The	ory of Computation", Lewis H.P. & Papadimition C.H. Pearson /PHI.

Course Co					Course				Le	cture	Som	ester:
BTCS513P	СТ					s of Algoi			L	Т Р	Sell	V
Version: 1.2			Date	of Appr	oval: 16	th BoS 1	7-11-2022		3	1 0		v
1	Scheme	of Inst	ruction				Sc	heme of	Exami	nation		
No. of I	Periods	: 60) Hrs.					М	aximur	n Score	: 1	00
Periods	/ Week	: 4						Inter	nal Eva	luation	: 3	80
	Credits	: 4							End Se	emester	: 7	'0
Instruction		: Le	ecture							uration	: 3	B Hrs.
Prerequisite(s				orithm		I			-			
Course Object												
1. To unders	tand the					hm desi	gn, implei	nental so	ome w	ell-know	n algo	rithms
and analyz									0.1			
2. To define												
3. To impart											ole pro	blems.
4. To provide		0	e of pro	blem sc	olving su	ich as tr	avelling sa	ales pers	on prol	olem.		
Course Outco	mes (CO):										
COs No.					Statem	ent					oed Pr comes	ogram (POs)
CO ₁	Analyze	a giver	algorit	hm and	expres	s its tim	e and spa	ce comp	lexities		D1, PO2,	
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							nd Maste			,		
CO ₂							r Strateg				PO ₃ , PO)4
002							ier Strate		mpure		0,	
CO ₃		<u> </u>		0		<u> </u>	ly strate	0	Design		PO ₄ , PC) 0
CO3							g and				104,10	9
	Technic					TIACKIII	g anu	Dianch	Dound	L		
		jues ioi	SOIVIIIE		ins.							
CO						nto D		llord on	d ND		DO. DO	٦.
CO ₄	Classify	comp	utation	al prot	olems i		NP, NP-				PO ₂ , PO	04
CO ₄	Classify Comple	comp te and	utation to unde	al prot erstandi	olems i ng abou	ut writin	g algorith	ms and	step by		PO ₂ , PC) ₄
	Classify Comple step ap	comp te and proach	utation to unde in solvi	al prot erstandi ng prob	olems i ng abou lems w	ut writin ith the h	g algorith elp of dat	ims and a a structu	step by 1res.	T	,	
PO 1- Engineeri	Classify Comple step ap	comp te and proach rledge,	utation to unde in solvin PO 2- Pr	al prot erstandi ng prob roblem a	olems i ng abou lems wa analysis,	ut writin ith the h PO 3- D	g algorith elp of dat esign/dev	ms and a structue elopment	step by ires. of sol	utions, I	PO 4- C	Conduct
PO 1- Engineeri investigations o	Classify Comple step ap ng Know f complex	comp te and proach dedge, k proble	utation to unde in solvin PO 2- Pr ms, PO 5-	al prot erstandi ng prob roblem a - Moderi	olems i ng abou lems w analysis, n tool us	ut writin ith the h PO 3- D age, PO 6-	g algorith elp of dat esign/dev - The engii	ims and a a structu elopment neer and a	step by ires. of sol society,	utions, H PO 7- Env	PO 4- C	Conduct ent and
PO 1- Engineeri	Classify Comple step ap ng Know f complex D 8- Ethics	comp te and proach dedge, k proble	utation to unde in solvin PO 2- Pr ms, PO 5-	al prot erstandi ng prob roblem a - Moderi	olems i ng abou lems w analysis, n tool us	ut writin ith the h PO 3- D age, PO 6-	g algorith elp of dat esign/dev - The engii	ims and a a structu elopment neer and a	step by ires. of sol society,	utions, H PO 7- Env	PO 4- C	Conduct ent and
PO ₁ - Engineeri investigations o sustainability, P	Classify Comple step ap ng Know f complex D 8- Ethics	comp te and proach dedge, c proble s, PO 9- In	utation to unde in solvin PO ₂ - Pr ms, PO ₅ - ndividual	al prob erstandi ng prob oblem a Modern l or team	olems i ng abou lems wa analysis, n tool us work, P	it writin ith the h PO ₃ - D age, PO ₆ - O ₁₀ - Com	g algorith elp of dat esign/dev - The engii	ams and a a structu elopment neer and a n, PO 11- Pr	step by ires. of so society, roject m	utions, I PO 7- Env	PO 4- C	Conduct ent and
PO ₁ - Engineeri investigations o sustainability, P	Classify Comple step ap ng Know f complex D ₈ - Ethice Learning	comp te and proach dedge, c probles s, PO 9- In Map	utation to unde in solvin PO ₂ - Pr ms, PO ₅ - ndividual	al prot erstandi ng prob oblem a - Modern l or team	blems i ng abou lems w analysis, n tool us work, P outcon	it writin ith the h PO3- D age, PO6- O10- Com nes with	g algorith elp of dat esign/dev The engin munication program	ans and a a structu elopment neer and a n, PO 11- Pr outcome	step by ires. of sol society, roject m	utions, H PO 7- Env anagemen	PO ₄ - C vironment and f	Conduct ent and inance,
PO ₁ - Engineeri investigations o sustainability, P PO ₁₂ - Life-long	Classify Comple step ap ng Know f complex D 8- Ethics	comp te and proach dedge, c proble s, PO 9- In	utation to unde in solvin PO ₂ - Pr ms, PO ₅ - ndividual	al prob erstandi ng prob oblem a Modern l or team	olems i ng abou lems wa analysis, n tool us work, P	it writin ith the h PO ₃ - D age, PO ₆ - O ₁₀ - Com	g algorith elp of dat esign/dev - The engin munication	ams and a a structu elopment neer and a n, PO 11- Pr	step by ires. of so society, roject m	utions, I PO 7- Env	PO 4- C	Conduct ent and inance,
PO ₁ - Engineeri investigations o sustainability, P PO ₁₂ - Life-long	Classify Comple step ap ng Know f complex D ₈ - Ethice Learning	comp te and proach dedge, c probles s, PO 9- In Map	utation to unde in solvin PO ₂ - Pr ms, PO ₅ - ndividual	al prot erstandi ng prob oblem a - Modern l or team	blems i ng abou lems w analysis, n tool us work, P outcon	it writin ith the h PO3- D age, PO6- O10- Com nes with	g algorith elp of dat esign/dev The engin munication program	ans and a a structu elopment neer and a n, PO 11- Pr outcome	step by ires. of sol society, roject m	utions, H PO 7- Env anagemen	PO ₄ - C vironment and f	Conduct ent and inance, PO 1
PO ₁ - Engineeri investigations o sustainability, P PO ₁₂ - Life-long Course Outcomes CO ₁	Classify Comple step ap ng Know f complex D ₈ - Ethics Learning PO ₁	comp ite and proach dedge, probles s, PO ₉ - In Map PO ₂	utation to unde in solvin PO ₂ - Pr ms, PO ₅ - ndividual oping of PO ₃ 3	al prob erstandi ng prob oblem a Modern l or team Course PO4	blems i ng abou lems w analysis, n tool us work, P outcon	it writin ith the h PO3- D age, PO6- O10- Com nes with	g algorith elp of dat esign/dev The engin munication program	ans and a a structu elopment neer and a n, PO 11- Pr outcome	step by ires. of sol society, roject m	utions, H PO 7- Env anagemen	PO ₄ - C vironment and f	Conduct ent and inance, PO 1
PO ₁ - Engineeri investigations o sustainability, P PO ₁₂ - Life-long Course Outcomes CO ₁ CO ₂	Classify Comple step ap ng Know f complex D ₈ - Ethics Learning PO ₁	comp ite and proach dedge, probles s, PO ₉ - In Map PO ₂	utation to unde in solvin PO ₂ - Pr ms, PO ₅ - ndividual pping of PO ₃	al prob erstandi ng prob oblem a Modern l or team Course PO4 2	blems i ng abou lems w analysis, n tool us work, P outcon	it writin ith the h PO3- D age, PO6- O10- Com nes with	g algorith elp of dat esign/dev The engin munication program	ans and a a structu elopment neer and a n, PO 11- Pr outcome	step by ires. of sol society, oject m es PO ₉	utions, H PO 7- Env anagemen	PO ₄ - C vironment and f	Conduct ent and inance, PO 1
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PO ₁ - Engineeri investigations o sustainability, P PO ₁₂ - Life-long Course Outcomes CO ₁ CO ₂	Classify Comple step ap ng Know f complex D ₈ - Ethics Learning PO ₁	comp ite and proach dedge, probles s, PO ₉ - In Map PO ₂	utation to unde in solvin PO ₂ - Pr ms, PO ₅ - ndividual pping of PO ₃ 3 3	al prot erstandi ng prob oblem a Modern lor team course PO4 2 2 2 2	olems i ng abou lems w analysis, n tool us work, P outcom PO 5	at writin ith the h PO ₃ - D age, PO ₆ - O ₁₀ - Com nes with PO ₆	g algorith elp of dat esign/deve The engin munication program PO 7	ans and a structure elopment the er and a structure of the er and a structure outcome outcome PO ₈	step by ires. of sol society, oject m es PO ₉	utions, H PO 7- Env anagemen	PO ₄ - C vironment and f	Conduct ent and inance, PO 1
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PO ₁ - Engineeri investigations o sustainability, P4 PO ₁₂ - Life-long 1 Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄	Classify Comple step ap ng Know f comple: D ₈ - Ethic: Learning PO ₁ 2	r comp te and proach dedge, proble: s, PO ₉ - In Map PO ₂ 2 2 2 2	utation to unde in solvin PO ₂ - Pr ms, PO ₅ - ndividual oping of PO ₃ 3 3 3 1 - Re duction	al prob erstandi ng prob oblem a · Modern lor team PO4 2 2 2 2 easonab : Algori	olems i ng abou lems w analysis, n tool us work, P outcon PO 5	at writin ith the h PO_3 - D age, PO_6 - O_{10} - Commes with PO_6 Signification seudo commes	g algorith elp of dat esign/deve The engin munication program PO 7 PO 7 I I I I I I I I I I	a structu elopment heer and s h, PO ₁₁ - Pr outcome PO ₈ cong	step by ires. of sol society, oject m es PO ₉ 1 g algo	rithms, 1	PO4- C vironmont and f PO11	PO ₁ 2 mance
PO ₁ - Engineeri investigations o sustainability, P4 PO ₁₂ - Life-long 1 Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄	Classify Comple step ap ng Know f comple: D ₈ - Ethic: Learning PO ₁ 2	r comp te and proach dedge, proble: s, PO ₉ - In Map PO ₂ 2 2 2 2 Intro Analy	utation to unde in solvin PO ₂ - Pr ms, PO ₅ - ndividual oping of PO ₃ 3 3 3 1 - Ro duction sis-Space	al prob erstandi ng prob oblem a · Modern lor team PO4 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	lems i ng abou lems w analysis, n tool us work, P outcon PO 5 ile; 2 - S ithm, P plexity,	at writin ith the h PO ₃ - D age, PO ₆ - O ₁₀ - Common nes with PO ₆ Signification seudo contribution Time contribution	g algorith elp of dat esign/dev- The engin munication program PO 7 PO 7 I I I I I I I I I I	ans and a structure elopment the er and a structure elopment the er and a structure elopment the er and a structure elopment elop	step by ires. of so society, oject m es PO ₉ 1 1 g algo totic N	PO10 PO10 rithms, otation-	PO4- C vironment and f PO11 Perfor O no	PO ₁ 2 mance,
PO ₁ - Engineeri investigations o sustainability, P PO ₁₂ - Life-long] Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Cont	Classify Comple step ap ng Know f comple: D ₈ - Ethic: Learning PO ₁ 2	comp te and proach (ledge, probles, PO ₂ - In Map PO ₂ 2 2 2 Intro Analy Omeg	utation to unde in solvin PO ₂ - Pr ms, PO ₅ - ndividual pping of PO ₃ 3 3 3 1 - Re duction sis-Spac ga notat	al prot erstandi ng prob oblem a Modern lor team course PO4 2 2 2 2 2 easonab : Algori ce com ion, Th	elems i ng abou lems w analysis, n tool us work, P outcom PO5 le; 2 – S ithm, P plexity, eta not	at writin ith the h PO3- D age, PO6- O10- Commons nes with PO6 Signification Seudo contribution Time contribution	g algorith elp of dat esign/dev. The engin munication program PO7 PO7 nt; 3 – Sta ode for e complexity vide and	ams and a structure elopment the er and a structure elopment the er and a structure outcome elopment the er and a structure outcome elopment elopme	step by <u>ires.</u> of sol society, oject m es PO ₉ 1 1 ug algo totic N r : Stru	PO10 PO10 rithms, otation-	PO4- C vironment and f PO11 Perfor O no	PO ₁ 2 mance,
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	mination and Evaluation Pattern: It include both internal evaluation (30 marks) comprising two class ional exams/ assignments/ quiz/ seminar presentation etc. and external evaluation (70 marks) which
	ainly end semester examination.
Text	t Books:
1	Thomas H. Coreman, Charles E. Leiserson and Ronald L. Rivest, "Introduction to Algorithms", Printice
	Hall of India.
2	Anany Levitin, "Introduction to the Design & Analysis of Algorithms", Pearson Education, 2007.
Refe	erence Books:
1	RCT Lee, SS Tseng, RC Chang and YT Tsai, "Introduction to the Design and Analysis of Algorithms",
	Mc Graw Hill, 2005.
2	E. Horowitz & S Sahni, "Fundamentals of Computer Algorithms", Berman, Paul," Algorithms", Cengage
	Learning.
3	Aho, Hopcraft, Ullman, "The Design and Analysis of Computer Algorithms" Pearson Education, 2008.

Course Co	ode			(Course	Title			Lec	ture	a	
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	Elements and dimensions of organizational culture, Importance of organizational
	culture in shaping the behaviour of people.
Exa	mination and Evaluation Pattern: It include both internal evaluation (30 marks) comprising two class
sess	sional exams/ assignments/ quiz/ seminar presentation etc. and external evaluation (70 marks) which
is m	ainly end semester examination.
Text	t Books:
1	Robbins, S. P., & Judge, T. (2013). Organizational behavior (15th ed.). Boston: Pearson.
2	Newstrom J. W., & Davis, K. (2011). Human behavior at work (12th ed.). Tata McGraw Hill
3	Nelson, D , Quick, J.C., & Khandelwal, P., (2011). ORGB . Cengage Learning.
4	Udai Pareek, Understanding Organisational Behaviour, 2 nd Edition, Oxford Higher Education, 2004.
Refe	erence Books:
1	Pareek U (2010) Understanding Organizational Behavior (2nd ed.) Oxford University Press

1Pareek. U. (2010). Understanding Organizational Behavior (2nd ed.). Oxford University Press2Schermerhorn, J. R., Osborn, R.N., Hunt, M.U.J (2016). Organizational Behavior (12th ed.). Wiley

Course Co					Course				Lec	ture	Som	ester:
BTCS512H	IST	Hi					y in India		L	T P		ester: V
Version: 1.2				of Appr	oval: 16	th BoS 17	7-11-2022		2	0 0		v
	Scheme	of Insti	ruction				Sc	heme of	Exami	nation		
No. of	Periods	: 30	Hrs.					Ма	ximum	Score	: 50)
Periods	/ Week	: 2						Intern	al Eval	uation	: 15	
	Credits	: 2						E	End Sei	nester	: 35	,
Instructio	n Mode	: Le	cture					Ex	kam Du	iration	: 21	Hrs.
Prerequisite(s	s): Basic l	knowled	lge of s	cience							1 1	
Course Object			0									
1. To acquir		owledge	e the ori	igin and	l develo	pment o	fastrono	ny in an	cient Iı	ndia.		
2. To unders												
3. To identif									tal in a	incient	India.	
4. To know												
Course Outco	mes (CO):				0	0					
COs No.		<i>,</i>			Statem	ent				Мар	ped Pr	ogram
											comes	
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CO ₂			wth of e	nginee	ring in a	ncient I	ndia.			1	PO ₉	
CO ₃						ancient					PO ₇ , PC	9
CO4							ndia to m	odern In	dia	PC	D ₈ , PO ₁₀ ,	
PO ₁ - Engineeri												
investigations of												
sustainability, P												
PO12- Life-long										Ű		
		Мар	ping of	course	outcon	nes with	program	outcome	es			
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Outcomes	r O ₁	PO ₂	FO3	FO4	FO5	F U ₆	FO 7	F 08	r Og	FO 10	F O ₁₁	2
CO ₁						2	2					
CO_2									2			
CO ₃							2		2			
CO ₄								2		2		2
			1 – Re	easonab	le; 2 – S	ignificar	nt; 3 – Str	ong				
Detailed Cont	ents:											
		Scien	ce and	Techno	logy- T	he Begin	ning					
							s of Scie	nce in	Ancien	t India	: Astro	nomy,
Unit: 1		Math	ematics	, Engin	eering	and Me	dicine. D	evelopm	ents in	metal	urgy: 1	Jse of
							ndia. Dev					
					erature			•		0 1		
		Devel	opment	s in Sci	ence an	d Techn	ology in N	/ledieval	India			
							pments i			dia; Infl	uence	of the
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Unit: 2							matics, C					
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Unit: 3	1		-				ıl India- S			nists. D	octors.	under
			ompany					<i>j</i>	,,	-, -		
						entific Kr	nowledge	Science	and Te	echnolo	gy in N	lodern
Unit: 4	-						nizations					
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							eginning a					
			ematics			onomy:			ryabht		Brahm	aunto
				anu	ASU	niunity.	Dauuila	yan, A				
		Bhack	zaraoha	ruo Vo				Madiaal	Soion	$- \Delta of M$	noion+	India
Unit: 5	, 1				rahamil	hira, Na	garjuna.					
Unit: 5	ì	(Ayur	veda &	Yoga): S	rahamil Susruta,	hira, Na Charak,	garjuna. Yoga & P	atanjali.	Scient	ists of N	/lodern	India:
Unit: 5	;	(Ayur Sriniv	veda &	Yoga): S anujan,	rahamil Susruta, , C.V. Ra	hira, Na Charak,	garjuna.	atanjali.	Scient	ists of N	/lodern	India:

	mination and Evaluation Pattern: It include both internal evaluation (30 marks) comprising two class
	ional exams/ assignments/ quiz/ seminar presentation etc. and external evaluation (70 marks) which
is m	ainly end semester examination.
Tex	t Books:
1	George G Joseph, Crest of the Peacock, Non-European roots of mathematics, Third edition,
	Princeton University Press, Princeton, NJ, 2011.
2	Agrawal, D.P., Ancient Metal Technology and Archaeology of South Asia (A Pan-Asian Perspective),
	Aryan Books International, New Delhi, 2000
Refe	erence Books:
1	Cunningham , Alexander , The Ancient Geography of India. Indological Book House, Varanasi, 1963.
2	Dey, N. L., The Geographical Dictionary of Ancient and Medieval India. Luzac and Co., London, 1927.

Course Co BTCS560F			Decid		Course	f Algoritl	hmsIAR		L	ture	S	emes	ster:
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Prerequisite(s				Algorith	ms			112		iration	·	211	15.
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2. To develo													
3. To experi									gramn	ning teo	chni	ques	
4. To implen								-	0	U			
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		-) and a	algorith	ıms lik	e Greed	ly, Dynar	nic, Divi	ide &				
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CO ₃		-	1		0	rithms for	r the requ	ired pro	blems	P	U 2, P	D 3, PC	J 4
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Note: Students can implement more algorithms based on prescribed syllabus.

	mination and Evaluation Pattern: It include both internal evaluation (50 marks) comprising two class
sess	sional exams/assignments/quiz/seminar presentation etc. and external evaluation (50 marks) which
is m	nainly end semester examination.
Tex	t Books:
1	Data structures, Algorithms and Applications in java, 2nd Edition, S. Sahani, Universities Press.
2	Data structures and Algorithms in java, 3rd edition, A. Drozdek, Cengage Learning.
Ref	erence Books:
1	Data structures with Java J R Hubbard 2nd edition Schaum's Outlines TMH

2 Data Structures using Java, D. S. Malik and P.S. Nair, Cengage Learning

BTCS51INCTConstitution of IndiaLTPVersion: 1.2Date of Approval: 16th BoS 17-11-2022200Scheme of InstructionNo. of Periods:30 Hrs.Maximum Score:5Periods/Week:2Internal Evaluation:11Credits:-End Semester:3Instruction Mode:LectureEnd Semester:3Instruction Mode:LectureExam Duration:2Prerequisite(s): No specific pre-requisite.Course Objectives:1T0 understand the salient features of the Indian Constitution2To impart the knowledge of the fundamental rights and fundamental duties of Indian citizens3To impart the knowledge of the fundamental rights and fundamental duties of Indian citizens4TO describe the directive principles of state policy and their significanceCourse Outcomes (CO):StatementMapped Pr OutcomesCO1Practice the moral values that ought to guide the Engineering professionCO2Know the definitions of risk and safety also discover different factors that affect the perception of riskC03Appreciate the Ethical issues and know the code of ethics adopted in various professional bodies and industries		Sem	_	ture					Course					Course Cod
Scheme of Instruction Scheme of Examination No. of Periods 1 30 Preiods/Week 1 2 Internal Evaluation 1 Credits 1 Credits 1 Credits 1 Credits 1 Credits 1 Curse Objectives: End Semester 1. To understand the salient features of the Indian Constitution. 2. To learn different ways of acquiring Indian Citizenship. 3. To impart the knowledge of the fundamental rights and fundamental duties of Indian citizens. 4. TO describe the directive principles of state policy and their significance. Course Outcomes (CO): Cos No. COs No. Statement Mapped Pr Outcomes CO4 Practice the moral values that ought to guide the Engineering profession. CO5 Know the definitions of risk and safety also discover different factors P0e, P0, P0e, P0e, P0e CO4 Justify the need for protection of human rights and to know about pole, P0e, P0e, P0e, engineering knowledge, P0e, "Polem analysis, P0s- Design/development of solutions, P0e- (nivestigations of complex problems, P0e- Moder tool	V		_										Г	
No. of Periods : 30 Hrs. Maximum Score : 5 Periods/Week i 2 Internal Evaluation : 1 Instruction Mode : Lecture Exam Duration : 1 2 Prerequisite(s): No specific pre-requisite. Course Objectives: . . 2 2 . To understand the salient features of the Indian Constitution. . 2 . . 2 .								h BoS 17	oval: 16	of Appr				
Periods/Week : 2 Internal Evaluation : 1 Credits : - End Semester : 3 Instruction Mode : Lecture Exam Duration : 2 Prerequisite(s): No specific pre-requisite. Exam Duration : 2 Course Objectives: . To learn different ways of acquiring Indian Citizenship. 3. To impart the knowledge of the fundamental rights and fundamental duties of Indian citizens. 4. TO describe the directive principles of state policy and their significance. Course Outcomes (CO): Cos No. Statement Mapped Pr Outcomes CO2 Know the definitions of risk and safety also discover different factors various professional bodies and industries. POs. PO. CO4 Justify the need for protection of human rights and to know about various professional bodies and industries. POs. POs. PO- Engineering various problems, POs- Modern tool usage, POs- The engineer and society, POr- Environm sustainability. POs- Ethics, POs- Pos modern work, POse- Communication, POn- Project management and POs- POs POs POs POs Outcomes PO1 PO2							Scl							
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Prerequisite(s): No specific pre-requisite. Course Objectives: 1. To understand the salient features of the Indian Constitution. 2. To learn different ways of acquiring Indian Citizenship. 3. To impart the knowledge of the fundamental rights and fundamental duties of Indian citizens. TO describe the directive principles of state policy and their significance. Course Outcomes (CO): COs No. Statement Mapped Provide of the profession. CO2 Know the definitions of risk and safety also discover different factors that affect the perception of risk. CO3 Appreciate the Ethical issues and know the code of ethics adopted in various professional bodies and industries. CO4 Justify the need for protection of human rights and to know about concept of women empowerment. POr: Engineering Knowledge. PO2: Problem analysis. PO3: Design/development of solutions, PO4: 0 Mapping of course outcomes with program outcomes Co4 Life-long Learning Mapping of course outcomes with program outcomes CO4 2 2 CO5 2 2 CO6 2 2 2 CO4 2 2 2 Obr: Engineering Knowledge. PO2: Problem courswith program outcomes PO4: PO4:			_								-	•		
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Unit: 4 officials and their roles, CEO Zila Pachayat: Position and role, Block														Unit: 4
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1	'Indian Polity' by Laxmikanth
2	'Indian Administration' by Subhash Kashyap
Refe	erence Books:
1	'Indian Constitution' by D.D. Basu
2	'Indian Administration' by Avasti and Avasti

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Course Objec	tives:					-						
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2. To design	n top-dov	vn and	bottom-	up pars	sers.							
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PO12- Life-long	Learning											
		Map	ping of	course	outcom	nes with	progra	m outco	mes			
Course	PO ₁	PO ₂	PO ₃	PO ₄	PO ₅	PO ₆	PO ₇	PO ₈	PO ₉	PO ₁₀	PO ₁₁	PO
Outcomes	FO1	PO ₂	F U 3	F 04	F U 5	FO ₆	FO/	F 08	r Og	F O 10	rUn	2
CO ₁	2		2									
			0	0	0							
CO_2			2	2	2							
CO ₂ CO ₃			2	2	2							
					2							
CO ₃			2 2	2	2	ignifica	nt; 3 – 1	Strong				
CO ₃ CO ₄	tents:		2 2	2	2	ignifica	nt; 3 – 1	Strong				
CO ₃ CO ₄	tents:	Intro	2 2 1 - Re	2 asonabl	2 le; 2 - S				w. Lexic	al Analy	vsis (sca	anner
CO ₃ CO ₄ Detailed Con			2 2 1 – Re	2 asonabl a: Phase	2 le; 2 - S	ompilati	on and	overvie	w. Lexic			
CO ₃ CO ₄		Regu	2 2 1 – Re oduction	2 asonabl : Phase : ages, fi	2 le; 2 – S es of co	ompilati tomata,	on and regular	overvie express	w. Lexic			
CO ₃ CO ₄ Detailed Con		Regu to fir	2 1 – Re oduction lar langu	2 asonabl : Phase lages, fi mata, s	2 le; 2 – S es of co inite autoria	ompilati tomata, generat	on and regular or (lex,	overvie express flex).	ions, fro	m regula	ar expre	ession
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CO ₃ CO ₄ Detailed Con	1	Regu to fir Synta autor	2 1 – Re oduction lar langu nite auto ax Analy nata, LL	2 asonabl a: Phase ages, fi mata, s ysis (Pa (1) gran	2 le; 2 – S es of co inite aut canner arser): m-mars	ompilati tomata, generat Context and to	on and regular or (lex, -free 1 p-down	overvie express flex). anguage n parsin	ions, fro	m regul	ar expre	ession -dow
CO ₃ CO ₄ Detailed Con Unit:	1	Regu to fir Synta autor SLR(1	2 1 – Re oduction lar langu nite auto ax Analy nata, LL), LR(1), J	2 asonabl ages, fi mata, s ysis (Pa (1) grar LALR(1)	2 le; 2 – S es of co inite au canner arser): n-mars gramm	ompilati tomata, generat Context and to ars and	on and regular or (lex, -free l p-down bottom	overvie express flex). anguage n parsin	ions, fro s and gi g, opera	m regula rammar tor grai	ar expre s, push mmars,	-dow LR(O
CO ₃ CO ₄ Detailed Con Unit:	1	Regu to fir Synta autor SLR(1 up pa	2 1 – Re oduction lar langu- nite auto ax Analy- nata, LL), LR(1), L ursing, au	2 asonabl ages, fi mata, s ysis (Pa (1) grar LALR(1) nbiguit	2 le; 2 – S canner arser): m-mars gramm y and L	ompilati tomata, generat Context and to ars and R parsin	on and regular or (lex, -free 1 p-down bottom g, LALl	overvie express flex). anguage n parsin n- R(1) parso	ions, from s and gr g, opera	m regula rammar tor gran ator (yao	ar expre s, push mmars, cc, bisoi	-dow LR(O
CO ₃ CO ₄ Detailed Con Unit: Unit:	2	Regu to fir Synta autor SLR(1 up pa Sema	2 1 – Re oduction lar langu nite auto ax Analy nata, LI), LR(1), lar ursing, au ontic An	2 asonabl ages, fi mata, s ysis (Pa (1) gran LALR(1) mbiguit alysis:	le; 2 – S le; 2 – S es of cc inite aur canner arser): 6 m-mars gramm y and L Attribu	ompilati tomata, generat Context and to ars and R parsin te gram	on and regular or (lex, -free l p-down bottom ng, LALI mars,	overvie express flex). anguage n parsin n- R(1) parse syntax o	ions, fro s and gi g, opera er genera lirected	m regula rammar tor gran ator (yao definitio	ar expre s, push mmars, cc, bison on, eval	-dow LR(O n). uatio
CO ₃ CO ₄ Detailed Con Unit:	2	Regu to fir Synta autor SLR(1 up pa Sema and	2 1 – Re oduction lar langu nite auto ax Analy nata, LI), LR(1), I ursing, an ntic An flow of	2 asonabl ages, fi mata, s ysis (Pa .(1) gran LALR(1) mbiguit alysis: attribu	2 le; 2 – S es of cc inite aur canner arser): m m-mars gramm y and L Attribu te in a	ompilati tomata, generat Context and to ars and R parsin te gram syntax	on and regular or (lex, -free l p-down bottom ag, LALI imars, t tree.	overvie express flex). anguage n parsin r- R(1) parse syntax o Symbol	ions, fro s and gi g, opera er genera lirected Table: 1	m regula rammar tor gran ator (yao definitio	ar expre s, push mmars, <u>cc, bisor</u> on, eval cture, s	-dow LR(O n). uatio
CO ₃ CO ₄ Detailed Con Unit: Unit:	2	Regu to fir Synta autor SLR(1 up pa Sema and attrib	2 1 – Re oduction lar langu nite auto ax Analy nata, LI), LR(1), l ursing, an intic An flow of outes an	2 asonabl ages, fi mata, s ysis (Pa (1) grar LALR(1) mbiguit alysis: attribu nd mar	2 le; 2 – S es of co inite autoriate canner arser): m-mars gramm y and L Attribu tte in a hageme	ompilati tomata, generat Context and to ars and R parsin te gram syntax nt. Rur	on and regular or (lex, -free 1 p-down bottom g, LALI mars, t tree. n-time	overvie express flex). anguage n parsin r- R(1) parse syntax o Symbol environ	ions, fro s and g g, opera er genera lirected Table: 1 ment: F	m regula rammar tor gran ator (yao definitio its strue Procedu	ar expre s, push mmars, <u>cc, bisor</u> on, eval cture, s	-dow LR(O n). uatio
CO ₃ CO ₄ Detailed Con Unit: Unit:	2	Regu to fir Synta autor SLR(1 up pa Sema and attrib parar	2 1 – Re oduction lar langu nite auto ax Analy nata, LL), LR(1), l ursing, an intic An flow of putes an neter pa	2 asonabl a: Phase ages, fi mata, s ysis (Pa (1) grar LALR(1) mbiguit alysis: attribu attribu nd mar ssing, v	2 es of cc inite aut canner arser): n-mars gramm y and L Attribu te in a nageme value re	ompilation tomata, generat Context and to ars and R parsin te gram syntax nt. Rur turn, me	on and regular or (lex, -free 1 p-down bottom ag, LALI mars, tree. -time emory a	overvie express flex). anguage n parsin - R(1) parse syntax o Symbol environ illocatio	ions, fro s and g g, opera er genera lirected Table: 1 ment: F n, and sc	m regula rammar tor gran ator (yao definitio definitio rocedu ope.	ar expre s, push mmars, cc, bisor on, eval cture, s re activ	-dow LR(O 1). uation symbo vatior
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CO ₃ CO ₄ Detailed Con Unit: Unit:	1 2 3	Regu to fir Synta autor SLR(1 up pa Sema and attrib parar Inter differ	2 1 – Re duction lar langunite autor ax Analy nata, LL), LR(1), L ursing, and intic An flow of butes an inter particular cmediat rent typ	2 asonabl ac Phase iages, fi mata, s ysis (Pa (1) grar LALR(1) mbiguit alysis: attribu ad mar ssing, v e Code pes of	2 le; 2 – S canner arser): m-mars gramm y and L Attribu te in a mageme value re Gener interm	ompilati tomata, generat Context and to ars and R parsin te gram syntax nt. Rur turn, me ration: nediate	on and regular or (lex, -free 1 p-down bottom ag, LALI mars, t tree. tree. tree. tree. Transla forms.	overvie express flex). anguage n parsin - R(1) parse syntax o Symbol environ allocatio ttion of Code	ions, fro s and g g, opera lirected Table: 1 ment: F n, and sc differen Improve	m regula rammar tor gran ator (yao definitio ts struc Procedu ope. at langu ement (ar expre s, push mmars, cc, bison on, eval cture, s re activ iage fea (optimiz	-dow LR(O n). uatio ymbo vatior atures ation
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CO ₃ CO ₄ Detailed Con Unit: Unit:	1 2 3	Regu to fir Synta autor SLR(1 up pa Sema and attrib parar Inter diffe: Analy optir Arch	2 1 – Re duction lar langu- nite auto ax Analy nata, LI), LR(1), larsing, an ntic An flow of outes an neter pa rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rmediata rme	2 asonabl a: Phase iages, fi mata, s ysis (Pa (1) gran LALR(1) mbiguit alysis: attribu nd man ssing, v e Code pes of ntrol-fle , global e depe	2 le; 2 – S es of cc inite aur canner arser): o n-mars gramm y and L Attribu te in a hageme value rei e Gener interm ow, dat optimiz ndent	ompilati tomata, generat Context and to ars and R parsin te gram syntax nt. Rur turn, me ration: nediate ca-flow zation, le code	on and regular or (lex, -free 1 p-down bottom ig, LALI imars, tree. in-time emory a forms. depend oop opt	overvie express flex). anguage n parsin (1) parso syntax o Symbol environ allocation ttion of Code dence e imizatio ement :	ions, fro s and gi g, opera er genera lirected Table: 1 ment: F n, and sc differen Improve tc.; Code n, peep- instruct	m regula rammar tor gran ator (yaa definitio its strue Procedu ope. at langu ement (hole op tion sc	s, push mmars, cc, bisor on, eval cture, s re activ age fea coptimiz timizativ hedulin	-down LR(O) 1). uation ymbo vation atures ation) t loca on etc g (fo
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Text	t Books:
1	Principles of compiler design -A.V. Aho .J.D.Ullman; Pearson Education.
2	Modern Compiler Implementation in C- Andrew N. Appel, Cambridge University Press.
Refe	erence Books:
1	lex&yacc – John R. Levine, Tony Mason, Doug Brown, O'reilly
2	Modern Compiler Design- Dick Grune, Henry E. Bal, Cariel T. H. Jacobs, Wiley dreamtech. 3.
3	Engineering a Compiler-Cooper & Linda, Elsevier
4	Compiler Construction, Louden, Thomson.

	Code				C	ourse 7	Гitle			Lec	ture		~	
BTCS61	2PCT						etworks	5		L	Т	Р	Sen	nester:
Version: 1.2				Date of				-02-202	4	3	1	0		VI
	Scher	ne of		uction					Scheme o	-	ninat	ion		
No.	of Perio	ls :	: 60	Hrs.					Ма	ximum	Sco	re	: 1	100
Perio	ds/We	ek :	: 4						Intern	al Eval	uatic	n	: :	30
	Credi	ts :	: 4						E	End Sei	mest	er	: ′	70
Instruc	tion Mo	le :	: Leo	cture					Ех	kam Di	iratio	on	: :	3 Hrs.
Prerequisit		ratin	ng Sys	tem										
Course Obje														
									ns and co					
				ompone	ents/in	strume	nt/equi	pment a	and thei	r resp	ectiv	e i	oles	in data
commu							· 1·1	T.41	1				.11.	
									s adminis	trators	s, Net	two	rks de	signers
4. To prov			eptor	world v	wide we	ed and t	neir gei	ierations	5.					
COURSE OUL COs No.	onies (v	.0).				Statem	ont					Mon	mod D	rogram
COS NO.						Statem	ent							s (POs)
CO ₁	Dem	onst	rate 1	he dif	ferent	protoco	ols lave	rs of th	e OSI n	nodel		ou	PO ₁ , F	
	TCP		i dive			protoco	jib ilayo		0 001 1	louor			,	
CO ₂			nt ar	d con	figure	the d	ifferent	types	of Net	works		P	O _{2,} PO	3, PO8
				protoc				51						
CO ₃	Und	ersta	nd t	he in	nportan	ce of	netwo	ork see	curity in	n dat	a		PO	6
			icatioı											
CO_4						ng sub-	systems	s and the	eir functi	ons in	а	P	O 2, PO	3, PO 4
PO ₁ - Engine				ation sy										
Course	Р),	Mapj PO ₂	oing of PO 3	course PO ₄	outcom	nes with	progran PO 7	n outcom		РС		PO ₁₁	
Outcomes		-1	2	- 03	104	103				PUA	PU			PO ₁₂
							-	F U 7	PU ₈	PO ₉	PU	/10	PO ₁₁	PO ₁₂
<u>CO1</u>	2		4	0			2	F 07		PO ₉	PU	/10	PO ₁₁	PO ₁₂
CO_2			1	2			2	F07	2	PO ₉		/10	PO ₁₁	PO ₁₂
CO ₂ CO ₃			_		2		-					/10	PO ₁₁	PO ₁₂
CO_2			1 2	2	2 2 asonabl		2		2	PO ₉		/10	PO ₁₁	PO ₁₂
CO ₂ CO ₃ CO ₄	2		_	2		le; 2 – S	2	nt; 3 - S	2	PO ₉		/10		PO ₁₂
CO ₂ CO ₃	2		2	2 1 - Re	asonabl		2 2 ignifica	nt; 3 – S	2 trong					
CO ₂ CO ₃ CO ₄	2		2 Data	2 1 – Re Comm	asonabl nunicat	ion: I	2 2 ignifica	nt; 3 – S nd Inf	2 trong	; Con	mpor	nen	ts o	f Data
CO ₂ CO ₃ CO ₄	2		2 Data comm	2 1 – Re Communicati	asonabl nunicat	ion: I em, Dat	2 ignification Data and a flow:	nt; 3 – S nd Inf	2 trong ormation Half-Du	; Con	mpor	nent x; C	ts o ompo	f Data nents o
CO ₂ CO ₃ CO ₄	ntents:		2 Data comm Comp	2 1 – Re Communicati uter N	asonabl nunicat lon syst Networl	ion: I em, Dat k; Data	2 ignificat	nt; 3 – S nd Inf Simplex, municat	2 trong ormation Half-Du	; Con plex, D lium;	mpor	nent x; C tal	ts o ompo and	f Data nents o Analog
CO ₂ CO ₃ CO ₄ Detailed Co	ntents:		2 Data comm Comp Trans	2 1 – Re Comm unicati uter M missior	asonabl nunicat ion syst Networl n. Classi	ion: I em, Dat k; Data fication	2 ignification Data at a Flow: S a Common of Common	nt; 3 – S nd Inf Simplex, municat puter N	2 crong ormation Half-Du ion Med etworks:	; Con plex, D lium; Netwo	mpor uplez Digi orks,	nent x; C tal LAN	ts of ompo and J, MA1	f Data nents o Analog N, WAN
CO ₂ CO ₃ CO ₄ Detailed Co	ntents:		2 Data comm Comp Trans PAN;	2 1 – Re Communicati uter M mission Networ	asonabl nunicat on syst Networl n. Classi k and i	ion: I em, Dat k; Data fication ts Devi	2 ignification Data at a Flow: S a Common of Common ces; Net	nt; 3 – S nd Inf Simplex, municat puter N twork To	2 trong ormation Half-Du ion Med etworks: opology;	; Con plex, D lium; Netwo	mpor uplez Digi orks,	nent x; C tal LAN	ts of ompo and J, MA1	f Data nents o Analog N, WAN
CO ₂ CO ₃ CO ₄ Detailed Co	ntents:		2 Data comm Comp Trans PAN; Baud	2 1 – Re Comm unicati uter M mission Networ Rate; Ba	asonabl nunicat on syst Networl n. Classi k and i andwidt	ion: I em, Dat k; Data fication ts Devi th; Thrc	2 ignifica Data and a Flow: S a Common of Common ces; Net bughput	nt; 3 – S nd Inf Simplex, municat puter N twork To and Lat	2 ormation Half-Du ion Meo etworks: opology; ency	; Con plex, D lium; Netwo ARPAN	mpor uple: Digi orks, NET;	nen x; C tal LAN Inte	ts o ompo and N, MA1 ernet;	f Data nents or Analog N, WAN Bitrate
CO ₂ CO ₃ CO ₄ Detailed Co	ntents:		2 Data comm Comp Trans PAN; Baud	2 1 – Re Communicati uter M missior Networ Rate; Ba uter M	asonabl nunicat on syst Networl n. Classi k and i andwidt	ion: I em, Dat k; Dat fication ts Devi th; Thrc s: Netv	2 ignification Data at a Flow: S a Common of Common ces; Net oughput	nt; 3 – S nd Inf Simplex, municat puter N twork To and Lat rdware	2 brmation Half-Du ion Med etworks: ppology; ency (Machin	; Con plex, D lium; Netwo ARPAN e, Noo	mpor uplez Digi orks, NET; le, I	nent x; C tal LAN Inte	ts or ompo and J, MAN ernet; ce); N	f Data nents of Analog N, WAN Bitrate
CO ₂ CO ₃ CO ₄ Detailed Co	ntents:		2 Data comm Comp Trans PAN; Baud Comp softwa	2 1 – Re Communicati uter M mission Networ Rate; Ba uter M are; Ne	asonabl nunicat on syst Networl h. Classi k and i andwidt etwork	ion: I em, Dat k; Data fication ts Devi th; Thrc s: Netv Applica	2 ignification Data at a Flow: S a Composition ces; Net oughput vork has ation; Si	nt; 3 – S nd Inf Simplex, municat puter N twork To and Lat ardware ignal an	2 brong ormation Half-Du ion Med etworks: opology; ency (Machin d Type;	; Con plex, D lium; Netwo ARPAN e, Noo Layer	mpor uple: Digi orks, NET; de, I de, I	nent x; C tal LAN Inte	ts of ompo and J, MAN ernet; ce); N itectu	f Data nents o Analog N, WAN Bitrate Jetwork re, OS
CO ₂ CO ₃ CO ₄ Detailed Co	ntents:		2 Data comm Comp Trans PAN; Baud Comp softwa Refere	2 1 – Re Communicati uter M mission Networ Rate; Ba uter M are; Ne ence Me	asonabl nunicat on syst Networl N. Classi 'k and i andwidt etwork etwork odel; Ne	ion: I em, Dat k; Data fication ts Devi th; Thrc s: Netv Applica etwork	2 ignification Data at a Flow: S a Composition ces; Net bughput vork ha ation; Si port and	nt; 3 – S nd Inf Simplex, municat puter N twork Te and Lat ignal an I Adress	2 crong ormation Half-Du ion Mec etworks: opology; ency (Machin d Type; . Physica	; Con plex, D lium; Netwo ARPAN e, Noo Layer I Layer	mpor uplez Digi orks, NET; de, I ed A : Tra	nenn x; C tal LAN Inte	ts o ompo and J, MAI ernet; ce); N itectu	f Data nents or Analog N, WAN Bitrate Network re, OSi n media
CO ₂ CO ₃ CO ₄ Detailed Co	ntents:		2 Data comm Comp Trans PAN; Baud Comp softwa Refere	2 1 – Re Communicati uter M mission Networ Rate; Ba uter M are; Ne ence Me	asonabl nunicat on syst Networl N. Classi 'k and i andwidt etwork etwork odel; Ne	ion: I em, Dat k; Data fication ts Devi th; Thrc s: Netv Applica etwork	2 ignification Data at a Flow: S a Composition ces; Net bughput vork ha ation; Si port and	nt; 3 – S nd Inf Simplex, municat puter N twork Te and Lat ignal an I Adress	2 brong ormation Half-Du ion Med etworks: opology; ency (Machin d Type;	; Con plex, D lium; Netwo ARPAN e, Noo Layer I Layer	mpor uplez Digi orks, NET; de, I ed A : Tra	nenn x; C tal LAN Inte	ts o ompo and J, MAI ernet; ce); N itectu	f Data nents or Analog N, WAN Bitrate Network re, OSi n media
CO ₂ CO ₃ CO ₄ Detailed Co	ntents:		2 Data comm Comp Trans PAN; Baud Comp softwa Reference Nodes	2 1 – Re Communicati uter M mission Networ Rate; Ba uter M are; Ne ence M s: End, I	asonabl nunicat on syst Networl h. Classi ik and i andwidt etwork etwork odel; Ne interme	ion: I em, Dat k; Dat fication ts Devi ts; Thrc s: Netv Applica etwork ediate; S	2 ignification a Flow: S a Composition of Composition ces; Net oughput vork has ation; Si port and Switchin	nt; 3 – S nd Inf Simplex, municat puter N twork Te and Lat irdware ignal an l Adress g; Circu	2 crong ormation Half-Du ion Mec etworks: opology; ency (Machin d Type; . Physica	; Con plex, D lium; Netwo ARPAN e, Noo Layer I Layer I Layer d Netv	mpor uple: Digi orks, NET; de, I ed A : Tra vork,	nen x; C tal LAN Inte Devi arch nsm Pae	ts o ompo and J, MAI ernet; ce); N itectu nissior cket-S	f Data nents or Analog N, WAN Bitrate Network re, OSi n media Switch;
CO ₂ CO ₃ CO ₄ Detailed Co	ntents:		2 Data comm Trans PAN; Baud Comp softwa Refere Nodes Data I	2 1 – Re Comm unicati uter M mission Networ Rate; Ba uter N are; Ne ence M ence M s: End, I	asonabl nunicat on syst Networl n. Classi k and i andwidt etwork etwork odel; Ne nterme	ion: I em, Dat k; Data fication ts Devi th; Thrc s: Netv Applica etwork ediate; S k-layer	2 ignifica Data a: a Flow: S a Com of Com ces; Net oughput vork ha ation; Si port and Switchin address	nt; 3 – S nd Inf Simplex, municat puter N twork Te and Lat rdware ignal an d Adress g; Circu sing; Ser	2 crong ormation Half-Du ion Mec etworks: opology; ency (Machin d Type; . Physica itswitche	; Con plex, D lium; Netwo ARPAN e, Noo Layer I Layer d Netv b-layer	mpor uple: Digi orks, NET; de, I ed A : Tra vork, rs; Fr	nent x; C tal LAN Inte Devi urch nsm Pae	ts or ompo and N, MAI ernet; ce); N itectu nissior cket-S	f Data nents o Analog N, WAN Bitrate Network re, OS n media Switch; rror and
CO2 CO3 CO4 Detailed Co Unit	.: 1		2 Data comm Trans PAN; Baud Comp softwa Refere Nodes Data I Types	2 1 – Re Communicati uter M mission Networ Rate; Ba uter N are; Ne ence Me s: End, I Link Lay ; Error	asonabl nunicat on syst Networl n. Classi k and i andwidt etwork odel; Ne interme yer: Lin Detecti	ion: I em, Dat k; Data fication ts Devi ts; Thrc s: Netv Applica etwork ediate; S k-layer on and	2 ignification Data at a Flow: 3 a Composed oughput oughput vork has ation; Si port and Switchin address Correction	nt; 3 – S nd Inf Simplex, municat aputer N twork To and Lat ignal an 1 Adress g; Circu sing; Ser ion Tech	2 crong ormation Half-Du ion Med etworks: opology; ency (Machin d Type; . Physica itswitche	; Con plex, D lium; Netwo ARPAN e, Noo Layer I Layer d Netw b-layer ement.	mpor uple: Digi orks, NET; de, I ed A : Tra vork, rs; Fr ary D	nem x; C tal LAN Inte Devi urch nsm Pae	ts or ompo and J, MAI ernet; ce); N itectu hissior cket-S ing; Er link p	f Data nents of Analog N, WAN Bitrate: Jetwork re, OSI n media Switch; rror and rotocol
CO ₂ CO ₃ CO ₄ Detailed Co	.: 1		2 Data comm Comp Trans PAN; Baud Comp softwa Refere Nodes Data I Types Sliding	2 1 – Re Communicati uter M mission Networ Rate; Ba uter N are; Networ are; Status are; Status are; Networ are; Status are; Networ are; Status are; Status a	asonabl nunicat on syst Network n. Classi k and i andwidt etwork odel; Ne odel; Ne odel; Ne odel; Ne odel; Charles ver: Lin Detecti ow Pro	ion: I em, Dat k; Data fication ts Devi ts Devi ts, Thrc s: Netv Applica etwork ediate; S k-layer on and tocol; M	2 ignification Data at a Flow: S a Common ces; Net oughput vork has ation; Si port and Switchin address Correction fultiple	nt; 3 – S nd Inf Simplex, municat puter N twork To and Lat ignal an d Adress g; Circu sing; Ser ion Tech Access –	2 trong ormation Half-Du ion Med etworks: opology; ency (Machin d Type; . Physica itswitche vices; Sul nique; El	; Con plex, D lium; Netwo ARPAN e, Noo Layer I Layer d Netv b-layer ement CD, CS	mpor uple: Digi orks, NET; de, I ed A : Tra vork, rs; Fr ary D SMA/	nen x; C tal LAN Inte Devi arch nsm Pae ani Data /CA	ts or ompo and J, MAI ernet; ce); N itectun ission cket-S ing; En link p , Rese	f Data nents of Analog N, WAN Bitrate Network re, OSI n media Switch; rror and rotocol rvation
CO2 CO3 CO4 Detailed Co Unit	.: 1		2 Data comm Comp Trans PAN; Baud Comp softwa Refere Nodes Data I Types Slidin Pollin	2 Communicati uter M mission Networ Rate; Ba uter N are; Net ence Me s: End, I ink Lay ; Error g Winde g, Toke	asonabl nunicat on syst Networl n. Classi k and i andwidt etwork odel; Ne nterme yer: Lin Detecti ow Prot n Passii	ion: I em, Dat k; Data fication ts Devi ts Devi ts, Thrc s: Netv Applica etwork ediate; S k-layer on and tocol; M	2 ignification Data at a Flow: S a Comp of Comp ces; Net oughput vork has ation; Si port and Switchin address Correction fultiple	nt; 3 – S nd Inf Simplex, municat puter N twork To and Lat ignal an d Adress g; Circu sing; Ser ion Tech Access –	2 trong ormation Half-Du ion Med etworks: opology; ency (Machin d Type; Physical itswitche vices; Sul nique; El - CSMA/	; Con plex, D lium; Netwo ARPAN e, Noo Layer I Layer d Netv b-layer ement CD, CS	mpor uple: Digi orks, NET; de, I ed A : Tra vork, rs; Fr ary D SMA/	nen x; C tal LAN Inte Devi arch nsm Pae ani Data /CA	ts or ompo and J, MAI ernet; ce); N itectun ission cket-S ing; En link p , Rese	f Data nents of Analog N, WAN Bitrate Network re, OSI n media Switch; rror and rotocol rvation
CO2 CO3 CO4 Detailed Co Unit	.: 1		2 Data comm Comp Trans PAN; Baud Comp softwa Refere Nodes Data I Types Slidin Pollin LANs;	2 Communicati uuter M mission Networ Rate; Ba uter N are; Net ence Me s: End, I .ink Lay ; Error g Wind- g, Toke IEEE S	asonabl nunicat on syst Network n. Classi k and i andwidt etwork odel; Ne nterme yer: Lin Detecti ow Prot n Passii tandarc	ion: I em, Dat k; Data fication ts Devi ts Devi th; Thrc s: Netv Applica etwork ediate; S k-layer on and tocol; M ng, FDN ls 802.1	2 ignification Data at a Flow: 3 a Common of Common ces; Net bughput vork has ation; Si port and Switchin address Correction fultiple 1	nt; 3 – S nd Inf Simplex, municat aputer N twork To and Lat ignal an d Adress g; Circu sing; Ser ion Tech Access – A, TDM	2 ormation Half-Du ion Med etworks: opology; ency (Machin d Type; . Physica itswitche vices; Sul nique; El - CSMA/ A; Link la	; Con plex, D lium; Netwo ARPAN e, Noo Layer I Layer d Netv b-layer ement CD, CS yer Net	mpor uple: Digi orks, NET; de, E ed A : Traa vork, rs; Fr ary D SMA/ twor	neni x; C LAN Inte Devi urch nsm Pac ami Data /CA k Do	ts or ompo and J, MAI ernet; ce); N itectun ission cket-S ing; En link p , Rese evices	f Data nents of Analog N, WAN Bitrate; Network re, OSI n media; Switch; Tror and rotocol; rvation , Virtual
CO2 CO3 CO4 Detailed Co Unit	: 1 : 2 : 3		2 Data comm Comp Trans PAN; Baud Comp softwa Refere Nodes Data I Types Slidin Pollin LANs; Netwo	2 Communicati uter M mission Networ Rate; Ba uter N are; Net ence Me s: End, I ink Lay ; Error g Wind- g, Toke IEEE S	asonabl nunicat on syst Networl h. Classi k and i andwidt etwork odel; Ne nterme yer: Lin Detecti ow Prot n Passir tandarc er: Rou	ion: I em, Dat k; Dat fication ts Devi ts, Thrc s: Netv Applica etwork ediate; S k-layer on and tocol; M ng, FDM ls 802.1: ting alg	2 ignification Data at a Flow: S a Comp of Comp ces; Net oughput vork hat ation; Si port and Switchin address Correction fultiple flA, CDM flagorithms	nt; 3 – S nd Inf Simplex, municat puter N twork Te and Lat ignal an d Adress g; Circu sing; Ser ion Tech Access – A, TDM	2 trong ormation Half-Du ion Med etworks: opology; ency (Machin d Type; Physical itswitche vices; Sul nique; El - CSMA/	; Con plex, D lium; Netwo ARPAN e, Noo Layer I Layer d Netv b-layer ement CD, CS yer Net	mpor uple: Digi orks, UET; de, I ed A : Tra rs; Fr ary D SMA/ tworf Proto	Devi LAN Inter Devi arch nsm Pac ami Data /CA	ts or ompo and J, MAI ernet; ce); N itectun issior cket-S ing; Er link p , Rese evices s; Cor	f Data nents o Analog N, WAN Bitrate Vetworl re, OS n media Switch; Tor and rotocol rvation , Virtua

		internet (IPv4 and IPv6); IPv6 Packet Format, Mapping Logical to Physical Address (ARP); Flow Control, Error Control and Congestion Control in TCP and SCTP.
	Unit: 5	World Wide Web (WWW): Uniform Resource Locator (URL), Domain Name Service (DNS), Resolution - Mapping Names to Addresses and Addresses to Names; Electronic Mail Architecture, SMTP, POP and IMAP; TELNET and FTP. Network Security: Malwares, Cryptography and Steganography; Secret-Key Algorithms, Public-Key Algorithms, Digital Signature, Virtual Private Networks, Firewalls.
Exa	mination and Evalı	nation Pattern: It include both internal evaluation (30 marks) comprising two class
sess	ional exams/ assig	nments/ quiz/ seminar presentation etc. and external evaluation (70 marks) which
is m	ainly end semester	examination.
Text	t Books:	
1	Forouzen, "Data C	ommunication and Networks ing", TMH
2	A.S. Tanenbaum, "	Computer Networks s", 3rd Edition, Prentice Hall India, 1997.
Refe	erence Books:	
1	S. Keshav, "An En	gineering Approach on Computer Networks ing", Addison Wesley, 1997
2	W. Stallings, "Data	a and Computer Communication", Macmillan Press, 1989

Course	Code				(Course '	Title			Le	ctu	re		
BTCS66							sign LAF	ξ		L	Т	P	Ser	nester:
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Course Obje		pire		5''										
	tify toke	ns b	v lexic	al analy	vsis									
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Course Out	<u> </u>			, 			0							
COs No.	,	,			S	Stateme	ent]	Mapp	ed Pi	rogram
												Outc	omes	s (POs)
CO ₁	Appl	y giv	ven gra	ammar	specific	cation d	levelop t	he prog	ram for	lexical) 3, PO 4	· /
	anal	-	-		1			1 0						
CO ₂	Impl	eme	ent give	en parse	er specit	fication	develop	the prog	ram for	top-]	PO3, PO	D 4,
	dow	n an	d botte	om-up	parsers			_						
CO ₃	Deve	lop	progra	am for s	syntax d	lirected	translat	ion sche	me]	PO ₃ , P	04
CO ₄	Deve	lop	algorit	thms to	genera	te code	for a tai	get mac	hine			PC) _{3,} PO ₄	, PO 5
PO1- Engine														
investigation														
sustainability			PO ₉ - Inc	dividual	or team	work, PC) ₁₀ - Comn	nunicatior	n, PO 11- Pr	oject n	nana	geme	nt and	finance
PO ₁₂ - Life-lor	ig Learni	g	Mapr											
					oourgo	autoom	og with	nrogram	outcom	00				
Course			map	ping of	course	outcom	es with	program	outcom	es				DO.
Course	P)1	PO ₂	PO ₃	PO ₄	outcom PO5	PO ₆	program PO ₇	outcom PO ₈	es PO ₉	I	PO ₁₀	PO	
Outcome	s PO	01		PO ₃	PO ₄	PO ₅					I	PO ₁₀	PO	1 PO ₁ 2
Outcome CO ₁	s PO)1		PO ₃	PO ₄						J	PO ₁₀	PO	1
Outcome CO ₁ CO ₂	s PO)1		PO ₃ 2 2	PO ₄ 2 2	PO ₅					I	PO ₁₀	PO	1
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Outcome CO ₁ CO ₂ CO ₃ CO ₄ Detailed Co Section A L 1. Wr	ntents: ist of Ex ite a Lex	pro	PO ₂	PO ₃ 2 2 2 2 1 - Re using I o find H	PO ₄ 2 2 2 2 asonabl Lex and Keyword	PO ₅ 2 2 e; 2 - S i yACC	PO ₆ ignifican tools: ifier, Con	PO 7 t; 3 - St 1	PO ₈	PO9				
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Outcome CO₁ CO₂ CO3 CO4 Detailed Co Section A L 1. Wr 2. Wr 3. Wr	ntents: ist of Ex ite a Lex ite a Lex ite a Lex	pro	PO ₂	PO ₃ 2 2 2 1 – Re using I to find F to find a to find a	PO ₄ 2 2 2 2 asonabl Lex and Ceyword and cound cound cound	PO ₅ 2 2 2 e; 2 - S i vACC d, Ident nt Vowe nt Uppe	PO ₆ ignifican tools: ifier, Cor els and C er Case a	PO7 PO7 Lt; 3 – Str Instant, Sj Consonan nd Lowe	PO ₈	PO ₉				
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20. Write a C program to check whether a given string belongs to grammar or not by using predictive parse

Examination and Evaluation Pattern: It include both internal evaluation (50 marks) comprising two class sessional exams/ assignments/ quiz/ seminar presentation etc. and external evaluation (50 marks) which is mainly end semester examination.

Text Books:

1 Principles of compiler design -A.V. Aho J.D.Ullman; Pearson Education.

2 Modern Compiler Implementation in C- Andrew N. Appel, Cambridge University Press.

Reference Books:

1 lex&yacc – John R. Levine, Tony Mason, Doug Brown, O'reilly

2 Modern Compiler Design- Dick Grune, Henry E. Bal, Cariel T. H. Jacobs, Wiley dreamtech. 3.

- 3 Engineering a Compiler-Cooper & Linda, Elsevier
- 4 Compiler Construction, Louden, Thomson.

Course C	ode			C	ourse T	itle			Lec	ture		
BTCS661			(works LA	B		L	T P	Sem	ester:
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Course Object	/ 1											
1. To under		functio	nalities	s of vari	ous lave	ers of OS	SI model.					
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	ment Dijk						test path	throug	h a grar	oh.		
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Course Outco												
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CO ₁	Apply th	ne encr	yption a	and dec	ryption	concep	ts in Linu	IX			D2, PO3, P	
	environ				51	1						
CO ₂	Ability t	o apply	approp	oriate al	lgorithn	n for the	finding of	of short	est	PC	D3, PO4, P	O 5
	route.	•			-		-					
CO ₃	Ability t	o confi	gure the	e routir	ng table.						PO ₄ , PO	5
CO ₄	Able to	o appl	y esse	ential	protoco	ols in	network	desig	n and	PC	D ₃ , PO ₅ , P	O 9
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investigations o sustainability, P	of complex O 8- Ethics,	problem PO9- Inc	ns, PO 5- dividual	Modern or team	tool usa work, PC	nge, PO 6- D10- Comm		neer and n, PO 11- P	society, Project m	PO ₇ - En	vironme	ent an
investigations o sustainability, P PO 12- Life-long	of complex Os- Ethics, Learning	problem PO ₉ - Ind Mapj	ns, PO ₅- dividual oing of o	Modern or team course	outcom	nge, PO 6- D10- Comr nes with	The engineration	neer and n, PO 11- P outcom	society, Project m	PO ₇ - En	vironme	ent an inanc
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	Scheme	of Instr	uction					Schem	e of Ex	ami	natio	n	
No. o	f Periods	: 30	Hrs.					Ν	Лахіти	ım S	core	:	200
Lab Hou	s/Week	: 6						Inte	ernal Ev	valua	tion	:	100
	Credits	: 6							End S	Seme	ester	:	100
Instruct	on Mode	: Pra	octical						Exam	Dura	tion	:	-
Prerequisite	s): Project	-I											
Course Objec	tives:												
1. To under	stand Soft	ware re	equirem	nent spe	ecificati	on and	designi	ing metł	nodolo	gy.			
2. Familiari	zation of	the syr	ntax, se	emantic	s, data	-types	and lil	orary fu	nction	s of	any	prog	ramming
language	s.	·						ĩ			·		C
3. To apply	ER Diagra	m, DFD	, UML f	or desig	gning th	e softw	are ap	plicatior	ı.				
4. To imple	ment the s	specifie	d proble	ems.				-					
Course Outco	omes (CO)	:	_										
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CO_2	Apply D		nethods	s for giv	en SRS						PO		PO ₉ , PO ₁₁
a 0		1 1		ana	1 1 .								POr
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CO ₃ CO ₄								rk e solutio	on		PO	3, PO5,	PO ₉ , PO ₁₁ ,
CO4 PO1- Engineer investigations sustainability, I	Able to ing Knowl of complex PO 8- Ethics,	implem edge, P problem	ent rea O2- Pro 18, PO 5-	l world blem a Modern	probler nalysis, tool usa	n into s PO 3- D ge, PO 6-	oftwar esign/d - The er	e solutio levelopm ngineer a	ent of nd soci	ety, I	tions, 20 7- E	03, PO5, PO PO4- Inviror	PO ₉ , PO ₁₁ , D ₁₂ Conduc iment and
CO ₄ PO ₁ - Engineer investigations sustainability, I PO ₁₂ - Life-long	Able to ing Knowl of complex PO 8- Ethics,	implem edge, P problem PO 9- Inc	oent rea O₂- Pro as, PO₅- dividual	l world blem an Modern or team	probler nalysis, tool usa work, PO	n into s PO 3- D ge, PO 6- 010- Com	softwar esign/d - The er municat	e solutio levelopm ngineer a	ent of nd soci - Projec	ety, I	tions, 20 7- E	03, PO5, PO PO4- Inviror	PO ₉ , PO ₁₁ , D ₁₂ Conduct ment and
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CO4 PO1- Engineer investigations sustainability, I PO12- Life-long Course Outcomes CO1 CO2 CO3 CO4 Detailed Con Base Examination sessional exa which is mair	Able to ing Knowl of complex PO ₈ - Ethics, Learning PO ₁ tents: d on real- and Evalu ms/ assig	implem edge, P problem PO ₉ - Inc Mapp PO ₂ 2 2 2 	ent rea O ₂ - Pro s, PO ₅ - dividual ping of o PO ₃ 2 2 2 2 1 - Re attern: s/ quiz	I world blem an Modern or team PO4 PO4 asonabl e/ prob	probler nalysis, tool usa work, PO outcom PO ₅ 2 2 2 2 2 e; 2 - Si lem spe	n into s PO3- D ge, PO6- boo-Com es with PO6 gnifica ccific interna	oftwar esign/d - The er municat progra PO ₇ nt; 3 –	e solutio levelopm ngineer a cion, PO ₁₁ m outco PO ₈ 2 Strong ation (10	ent of nd socie- Projec PO9 2 2 2 2 2	P ks) c	Dio ompr	P3, PO5, P04- nviror ient ar PO2 2 2 2 2 2 2 2 2 2	PO9, PO11, D12 Conduction international 1 PO12 2 2 two class
CO4 PO1- Engineer investigations sustainability, I PO12- Life-long Course Outcomes CO1 CO2 CO3 CO4 Detailed Con Base Examination sessional exa which is mair	Able to ing Knowl of complex PO ₈ - Ethics, Learning PO ₁ tents: d on real- and Evalu ms/ assig	implem edge, P problem PO ₉ - Inc Mapp PO ₂ 2 2 2 	ent rea O ₂ - Pro s, PO ₅ - dividual ping of o PO ₃ 2 2 2 2 1 - Re attern: s/ quiz	I world blem an Modern or team PO4 PO4 asonabl e/ prob	probler nalysis, tool usa work, PO outcom PO ₅ 2 2 2 2 2 e; 2 - Si lem spe	n into s PO3- D ge, PO6- boo-Com es with PO6 gnifica ccific interna	oftwar esign/d - The er municat progra PO ₇ nt; 3 –	e solutio levelopm ngineer a cion, PO ₁₁ m outco PO ₈ 2 Strong ation (10	ent of nd socie- Projec PO9 2 2 2 2 2	P ks) c	Dio ompr	P3, PO5, P04- nviror ient ar PO2 2 2 2 2 2 2 2 2 2	PO ₉ , PO ₁₁ , D ₁₂ Conduction international conduction international inte
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				C	ourse T	'itle			L	ectu	re	Som	octor.
	PCP]	Project-	·III			L	Т	Р		nester: VII
			Date o	f Appro	val: 16tl	h BoS 17-	-11-2022		0	0	6		V 11
No. of	Scheme of	of Instr	uction				S	cheme o	of Exa	amin	ation		
	Periods	: 30) Hrs.					М	axim	um S	Score	:	200
Lab Hours	/ Week	: 6						Inter	mal E	valua	ation	:	100
	Credits	: 6							End	Sem	ester	:	100
Instructio	on Mode	: Pr	actical					I	Exam	Dura	ation	:	-
Prerequisite(s	s): Project	-I & Pro	oject-II										
Course Object	ives:												
l. To unders													
2. Familiariz		the syr	ntax, se	emantic	s, data-	-types a	nd libra	ary func	tions	s of	any p	orogra	mming
languages													
3. To apply E					gning th	e softwa	re appli	cation.					
4. To implen			d proble	ems.									
Course Outco	mes (CO):				~ .								
COs No.				5	Stateme	ent							ogram
		0.00											(POs)
CO ₁	Applyin	g SRS, t	echniq	ues							PO ₂ ,	PO ₃ , PO PO ₁₁	D 8, PO 9,
CO ₂	Apply D	esion n	nethods	for giv	en SRS						PO ₃		D 9, PO 11
CO ₃						ned Frai	nework					PO ₃ , P	
CO4						n into so							D 9, PO 11,
004	11010 00				P100101		i on ai o c				,	PO ₁₂	, ,
PO12- Life-long l		Марр	oing of o	course (outcom	es with p	orogram	outcom	nes				
Course	PO ₁	PO ₂	PO ₃	PO ₄	PO ₅	PO_6	PO ₇	PO ₈	PO	9	PO ₁₀	PO 11	PO
Outcomes	PO ₁	PO ₂		PO ₄	PO ₅	PO ₆	PO ₇			9	PO ₁₀	PO ₁₁	2 PO
Outcomes CO ₁	PO ₁	PO ₂	2	PO ₄		PO ₆	PO ₇	PO ₈	2	9	PO ₁₀	2	
Outcomes CO ₁ CO ₂	PO ₁		2 2 2	PO ₄	2	PO ₆	PO ₇			9	PO ₁₀		
OutcomesCO1CO2CO3	PO1		2 2 2	PO ₄	2 2 2	PO ₆	PO ₇		2 2	9	PO ₁₀	2 2	2
Outcomes CO ₁ CO ₂	PO1		2 2 2 2 2		2 2 2 2			2	2	9	PO ₁₀	2	
OutcomesCO1CO2CO3			2 2 2 2 2		2 2 2 2	PO ₆		2	2 2	9	PO ₁₀	2 2	2

<mark>LIST OF</mark> PROFESSIONAL ELECTIVES

Course Co					ourse T				Lec	ture	Sem	ester:
BTCS511P	ET					ming La			L	T P		V
Version: 1.2				f Appro	val: 16tl	h BoS 17			3	1 0		
	Scheme	1 1					S	cheme o			1 1	
	Periods		Hrs.						aximun			00
Periods		: 4						Inter	nal Eva			0
	Credits	: 4							End Se		: 7	0
Instructio			cture					I	Exam Di	uration	: 3	Hrs.
Prerequisite(s		mming	for Pro	blem Sc	olving							
Course Object												
1. To study a								derlying	mather	natical t	heories	5.
2. To introdu												
3. To provide												
4. To provid					d sema	ntics, c	oncurre	ncy, fun	ctional,	logic I	orograf	nming
languages			nguage	s.								
Course Outco	mes (CO)	:										
COs No.				5	Stateme	nt					oed Pro	
										Outo	comes ((POs)
CO ₁	Unders	tand to	express	s syntax	and set	mantics	in form	al notatio	on.		PO2, PO3	3
CO ₂			_			n for the				PC	D 3, PO 4, P	06
CO ₃								mplemer	ntation.		PO ₄ , PO	5
CO ₄								progra			PO ₃ , PO ₄	4
-	languag	-	5	1				1 0	0			
PO ₁ - Engineerin investigations of sustainability, P (f complex 0 8- Ethics	problem	ns, PO 5-	Modern	tool usa	ige, PO 6-	The eng	ineer and	society,	PO ₇ - En	vironme	ent and
PO12- Life-long l	Learning											
		Мар	ping of	course	outcom	es with	progran	n outcon	nes			
Course Outcomes	PO ₁	PO ₂	PO ₃	PO ₄	PO ₅	PO ₆	PO ₇	PO ₈	PO ₉	PO ₁₀	PO ₁₁	PO ₁
CO ₁		2	2									
CO ₂			3	2	1							
CO ₃				2	1							
CO ₄			2		1							
	1		1 – Re	asonabl	le: 2 - Si	ignificar	it: 3 - Si	rona				1
Detailed Cont	ents:		-		,	J		5				
		Introd	uction: (Overview	v of dif	ferent p	rogramm	ing para	digms e	.g. impe	rative,	object
Unit: 1						oncurrer			0	0 1	,	5
Unit: I		Syntax										
							ning lar	nguages: A				syntax
			cation ai	nd semif	ormal se	mantic s _l	ning lar pecificati	nguages: A on using a	attribute	gramma	r.	
TT 1/2 O		Impera	cation ai ative and	nd semif l OO Lar	ormal se iguages:	mantic sj Names, t	ning lar becificati heir scop	nguages: A on using a oe, life and	attribute 1 binding	gramma g. Control	r. -flow, c	ontrol
Unit: 2		Impera abstrac	cation an ative and ction; in	nd semif l OO Lar subprog	ormal se iguages: ram and	mantic sj Names, t exceptio	ning lar Decificati heir scor n handlir	nguages: A on using a oe, life and ng. Primiti	attribute l binding ive and c	gramma g. Control	r. -flow, c	ontrol
Unit: 2		Impera abstrac data ab	cation an ative and ction; in ostractio	nd semif 1 OO Lar subprog n, inheri	ormal se nguages: ram and tance, ty	mantic sj Names, t exceptio pe check	ning lar pecificati heir scop n handlir ing and J	nguages: A on using a oe, life and ng. Primit polymorpl	attribute l binding ive and c hism.	gramma g. Control constructo	r. -flow, co ed data	ontrol types,
		Impera abstrac data ab Functi	cation an ative and etion; in ostractio onal La	nd semif I OO Lar subprog n, inheri nguages	ormal se nguages: ram and tance, ty : Typed-	mantic sp Names, t exceptio pe check calculus,	ning lar becificati heir scop n handlir ing and p higher	nguages: A on using a oe, life and ng. Primiti oolymorpl order fu	attribute l binding ive and c hism.	gramma g. Control constructo	r. -flow, co ed data	ontrol types,
Unit: 2 Unit: 3		Impera abstrac data ab Functi strateg	cation an ative and ction; in ostractio onal La gies, type	nd semif I OO Lar subprog n, inheri nguages e checkir	ormal se nguages: ram and tance, ty : Typed- ng, imple	mantic sj Names, t exceptio pe check calculus, mentatio	ning lar becificati heir scop n handlir ing and p higher n, case s	nguages: A on using a oe, life and ng. Primiti oolymorpl order fu	attribute I binding ive and c hism. nctions	gramman c. Control constructo and type	r. -flow, co ed data es, evalu	ontrol types, uation
		Impera abstrac data ab Functi strateg Logic resolut	cation an ative and ction; in ostractio onal La gies, type Programi cion, unit	nd semif 1 OO Lar subprog n, inheri nguages e checkir mming fication,	ormal se nguages: ram and itance, ty : Typed- ng, imple Languag sequenc	mantic sp Names, t exceptio pe check calculus, mentatio ges: Comp ing of com	ning lar becificati heir scop n handlin ing and p higher n, case st buting v htrol, neg	nguages: A on using a oe, life and ng. Primiti polymorpl order fur tudy. vith rela- gation, im	attribute I binding ive and c hism. nctions tion, fir plement:	gramman c. Control construct and type st-order ation, cas	r. -flow, co ed data es, evalu logic, e study.	ontrol types, uation SLD-
Unit: 3		Impera abstrac data ab Functi strateg Logic resolut Concu	cation and ative and ction; in ostractio onal La gies, type Program cion, unit rrency: (nd semif 1 OO Lar subprog n, inheri nguages e checkir nming fication, Commur	ormal se nguages: ram and tance, ty : Typed- ng, imple Languag sequenc nication a	mantic sp Names, t exceptio pe check calculus, mentatio ges: Comp ing of con and synch	ning lar pecificati heir scop n handlin ing and p higher n, case s puting v ntrol, neg pronizatio	nguages: A on using a oe, life and ng. Primiti oolymorph order fui tudy. vith rela gation, im- on, shared	attribute I binding ive and c hism. nctions tion, fir plement:	gramman c. Control construct and type st-order ation, cas	r. -flow, co ed data es, evalu logic, e study.	ontrol types, uation SLD-
		Impera abstrac data ab Functi strateg Logic resolut Concu safety	cation and ative and ection; in ostractio onal La gies, type Program cion, unif rrency: (and liver	nd semif I OO Lar subprog n, inheri nguages e checkir mming fication, Commun	ormal se nguages: ram and itance, ty : Typed- ng, imple Languag sequenc nication a perties, r	mantic sp Names, t exceptio <u>pe check</u> calculus, mentatio ges: Comp ing of con and synch nultithrea	ning lar pecificati heir scop n handlin ing and p higher n, case s puting v ntrol, neg nronizatio aded pro	nguages: A on using a oe, life and ng. Primiti oolymorph order fui tudy. vith rela gation, im on, shareo gram.	attribute I binding ive and c hism. nctions tion, fir plementa I memor	grammai constructo and type st-order ation, cas y and mes	r. -flow, co ed data es, evalu logic, e study. ssage pa	ontrol types, uation SLD- ssing,
Unit: 3 Unit: 4		Impera abstrac data at Functi strateg Logic resolut Concu safety a Forma	cation an ative and ction; in ostractio onal La gies, type Progran cion, unif rrency: (and liver l Seman	nd semif I OO Lar subprog n, inheri nguages e checkir mming fication, Commun ness proj tics: Op	ormal se nguages: ram and itance, ty : Typed- ng, imple Languag sequenc nication a perties, r erational	mantic sp Names, t exceptio ype check calculus, mentatio ges: Comp ing of con and synch nultithres	ning lar pecificati heir scop n handlir ing and p higher n, case st puting v ntrol, neg nronizatio aded pro- tional and	nguages: A on using a oe, life and ng. Primiti oolymorph order fut tudy. vith rela gation, im on, shared gram. d axiomat	attribute l binding ive and c hism. nctions tion, fir plement l memor	grammai constructor and type st-order ation, cas y and mes	r. -flow, c ed data es, evalu logic, <u>e study.</u> ssage pa oy lang	ontrol types, uation SLD- ussing, uages,
Unit: 3		Impera abstrac data at Functi strateg Logic resolut Concu safety Forma langua	cation an ative and ction; in ostractio onal La gies, type Progran tion, unif rrency; (and liver I Seman ges with	nd semiff I OO Lar subprog n, inheri nguages e checkir mming fication, Commun ness proj tics: Op higher	ormal se nguages: ram and tance, ty : Typed- ng, imple Languag sequenc nication a perties, r erational order co	mantic sp Names, t exceptio ype check calculus, mentatio ges: Comp ing of con and synch nultithres d, denotat	ning lar pecificati heir scop n handlir ing and p higher n, case st puting v ntrol, neg nronizatio aded pro- tional and	nguages: A on using a oe, life and ng. Primiti oolymorph order fui tudy. vith rela gation, im on, shareo gram.	attribute l binding ive and c hism. nctions tion, fir plement l memor	grammai constructor and type st-order ation, cas y and mes	r. -flow, c ed data es, evalu logic, <u>e study.</u> ssage pa oy lang	ontrol types, uation SLD- ussing, uages,
Unit: 3 Unit: 4 Unit: 5	d Evaluat	Impera abstrac data ab Functi strateg Logic resolut Concu safety Informa langua nondet	cation an ative and ction; in ostractio onal La gies, type Progran cion, unit rrency: (and liver l Seman ges with cerminis	nd semif d OO Lar subprog n, inheri nguages e checkir nming fication, Commun hess proj tics: Op higher m and co	ormal se nguages: ram and tance, ty : Typed- ng, imple Languag sequenc nication a perties, r erational order co oncurren	mantic sp Names, t exceptio pe check calculus, mentatio ges: Comp ing of con and synch nultithrea d, denotation onstructs acy.	ning lar pecificati heir scop n handlir ing and J higher n, case si puting v ntrol, neg aronizatio aded pro cional and and type	nguages: A on using a pe, life and ng. Primiti oolymorph order fui tudy. vith relai gation, im on, sharec gram. d axiomat	attribute l binding ive and c hism. nctions tion, fir plementa l memor cic semai ive type,	grammal g. Control constructo and type st-order ation, cas y and mes ntics of t subtype,	r. -flow, cc ed data es, evalu logic, e study. ssage pa oy lang semant	ontrol types, Lation SLD- issing, uages, tics of
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Course C	ode									ture Semester		
BTCS5121	PET								L	T P		V
Version: 1.2				f Appro	val: 16t	h BoS 17	-11-2022		3	1 0		v
	Scheme	of Instr	uction				Se	cheme o	of Exam	ination		
No. of	Periods	: 60	Hrs.					Μ	laximum	n Score	: 1	00
Periods	s/Week	: 4						Inter	rnal Eval	luation	: 3	30
	Credits	: 4							End Ser	mester	: 7	'0
Instructio	on Mode	: Le	cture]	Exam Dı	iration	: 3	8 Hrs.
Prerequisite(s	s): Design	& Anal	ysis of A	lgorith	m	•						
Course Object	tives:		0	0								
 To learn p passing m To unders 	odels.			U		-	techniq	ues for	shared r	nemory	and m	essage
3. To study							allel algo	rithms.				
4. To provid												
Course Outco		<u> </u>										
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201							time co				, - 0	
CO ₂	Apply th			<u> </u>			unite ees		<i>.</i>		PO _{3.} PO	4
CO ₃	Explore		<u> </u>	<u> </u>							PO ₂ , PO	
<u>CO4</u>						ory techi	niques				D ₂ , PO ₃ , I	
PO ₁ - Engineeri								elonmen	t of sol			
investigations o sustainability, P PO 12 ⁻ Life-long	O ₈ - Ethics	, PO 9- In	dividual	or team	work, PC	D ₁₀ - Comn	nunication	n, PO 11- F	Project m			
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C ~~~~~~					1		or ogram		100	1		
Course Outcomes	PO ₁	PO ₂	PO ₃	PO ₄	PO ₅	PO ₆	PO ₇	PO ₈	PO ₉	PO ₁₀	PO ₁₁	PO ₁
	PO ₁	PO ₂	PO ₃							PO ₁₀	PO ₁₁	
Outcomes			PO ₃							PO ₁₀	PO ₁₁	
Outcomes CO ₁ CO ₂		2		PO ₄						PO ₁₀	PO ₁₁	
Outcomes CO1 CO2 CO3			2	PO ₄						PO ₁₀	PO ₁₁	
Outcomes CO ₁ CO ₂		2	2 2 2	PO ₄	PO ₅	PO ₆	PO ₇	PO ₈		PO ₁₀	PO ₁₁	
Outcomes CO1 CO2 CO3 CO4	2	2	2 2 2	PO ₄	PO ₅	PO ₆		PO ₈		PO ₁₀	PO ₁₁	
Outcomes CO1 CO2 CO3	2	2 2 2 2	2 2 2 1 - Re	PO ₄ 2 2 asonabl	PO ₅	PO ₆	PO ₇	PO ₈	PO ₉			2
Outcomes CO1 CO2 CO3 CO4	2 ents:	2 2 2 Basic	2 2 2 1 - Re	PO ₄ 2 2 asonabl	PO ₅ e ; 2 – S i ed for p	PO ₆	PO ₇	PO ₈	PO ₉	mputati	on, Ana	alyzing
Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Cont	2 ents:	2 2 2 Basic paral	2 2 2 1 - Re	PO ₄ 2 2 asonabl	PO ₅ e ; 2 – S i ed for p	PO ₆	PO ₇ t; 3 – Str	PO ₈	PO ₉	mputati	on, Ana	alyzing
Outcomes CO1 CO2 CO3 CO4 Detailed Cont	2 eents:	2 2 2 Basic paral Com	2 2 1 – Re Technidel algorization	PO ₄ 2 asonabl que, Ne rithms,	PO ₅	PO ₆ ignificant parallel c sing par	PO ₇ t; 3 – Str	PO ₈	PO ₉	mputati el, Paral	on, Ana lel & C	2 alyzing
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Prerequisite(s):				S					-		-		
Course Objectiv		,											
1. To make the		s to kno	ow abo	ut under	standing	g of the c	lata oper	ations.					
2. To make the									ne basic	s of	mac	hine le	earning
techniques o				1	1								U
3. To analyze t			regress	sion, cla	ssificati	on prob	lem.						
4. To apply alg								rning.					
Course Outcom													
COs No.				S	tateme	nt]	Map	ped Pr	ogram
											Out	comes	(POs)
CO ₁	Unders	tand th	e conc	epts of	data s	cience j	process,	data s	cience			PO ₁ , PO	\mathbf{D}_2
	toolkit,	Types o	of data,	Data co	llection	and ma	nagemei	nt					
CO_2	Demons	strate tl	he conc	ept of s	imple st	tatistical	models	and the	basics			PO_2	
	of mach	ine lea	rning te	echniqu	es of re	gression							
CO ₃	Apply th	ne regre	ession a	nd clas	sificatio	on proble	em and c	reate th	ie			PO ₃	
	Databas	ses											
CO ₄	Analyze	the da	ata, Apj	olication	ns of Da	ata Scie	nce, Tec	hnologi	es for			PO ₃	
	data vis	ualizati	on										
sustainability, POs	- Ethics, I	₽ O 9- Ind	s, PO 5- 1 ividual c	Modern t or team v	tool usag vork, PO	ge, PO 6- ' 10- Comm	nunication	neer and 1, PO 11- P	society roject n				nent and
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1	Introduction to Data Science a Python approach to concepts, Techniques and Applications, Igual, L;Seghi', S. Springer, ISBN:978-3-319-50016-4
Refer	rence Books:
1	Python Data Analysis, Second Ed., Armando Fandango, Packt Publishing, ISBN: 9781787127487
2	Data Analysis with Python A Modern Approach, David Taieb, Packt Publishing, ISBN-9781789950069

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	Unit: 5	Cluster Analysis: Basic Clustering methods, Partitioning methods, Density – Based Methods, Grid- based methods, and Evaluation of Clustering, Outlier
	Unit. 5	Analysis and Detection methods. Data Mining Trends and Research Frontiers:
		Mining Complex Data Types, Data Mining Applications, Data Mining Trends
Exar	nination and Evalu	ation Pattern: It include both internal evaluation (30 marks) comprising two class
sess	ional exams/assigr	ments/ quiz/ seminar presentation etc. and external evaluation (70 marks) which
	ainly end semester	
	Books:	
1	Han J & Kamber M	, "Data Mining: Concepts and Techniques", Harcourt India, Elsevier India, Second
	Edition.	
2	Pang-NingTan. M	ichaelSteinback,VipinKumar, "Introduction to Data Mining", Pearson Education,
	2008.	-
Refe	rence Books:	
1	Margaret H Dunha	m,S.Sridhar, "Data mining: Introductory and Advanced Topics", Pearson Education,
	2008.	
2	Humphires,hawkii	ns,Dy, "Data Warehousing: Architecture and Implementation", Pearson Education,
	2009.	
3	Anahory, Murray,	"Data Warehousing in the Real World", PearsonEçiucation, 2008.
4	Kargupta,Joshi,etc	c., "Data Mining: Next Generation Challenges and Future Directions" Prentice Hall
	of IndiaPvtLtd, 200	07.

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	Unit: 5	Networking: Socket, Socket Module, Methods, Client and server, Internet modules Multithreading: Thread, Starting a thread, Threading module, Synchronizing
	Unit. 5	threads, Multithreaded Priority Queue
		GUI Programming: Introduction, Tkinter programming, Tkinter widgets,
		Sending email
Exar	mination and Evalu	ation Pattern: It include both internal evaluation (30 marks) comprising two class
sess	ional exams/ assigr	nments/ quiz/ seminar presentation etc. and external evaluation (70 marks) which
is m	ainly end semester	examination.
Text	t Books:	
1	Sheetal Taneja a	nd Naveen Kumar, "Python Programming - A Modular Approach", Pearson
	education.	
2	Cay S. Horstmann	and Rance D. Necaise, "Python for Everyone", Wiley.
Refe	erence Books:	
1	Allen Downe, "Lea	arning With Python", Wiley.
2	Jake VanderPlas, '	'Python Data Science Handbook", O'Reilly' Publisher

Course (ourse 7				Lec	ture	Som	ester:
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Version: 1.2				of Appro	oval: 16t	h BoS 17			3	1 0		• 1
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Perioc	ls/Week	: 4							nal Eval			30
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	Unit: 5	Inter Connection and Networks: Introduction, Interconnection network media, Practical issues in interconnecting networks, Examples of inter connection, Cluster, Designing of clusters.
Exai	mination and Evalu	ation Pattern: It include both internal evaluation (30 marks) comprising two class
sess	ional exams/ assign	ments/ quiz/ seminar presentation etc. and external evaluation (70 marks) which
is m	ainly end semester	examination.
Text	t Books:	
1	John L. Hennessy,	David A. Patterson – Computer Architecture: A Quantitative Approach, 3rd
	Edition, An Imprin	t of Elsevier.
2	John P. Shen and M	Miikko H. Lipasti – Modern Processor Design : Fundamentals of Super Scalar
	Processors	
Refe	erence Books:	
1	Computer Archite	cture and Parallel Processing – Kai Hwang, Faye A.Brigs., MC Graw Hill.
2	Advanced Comput	er Architecture – A Design Space Approach – Dezso Sima, Terence Fountain,
	Peter Kacsuk , Pea	rson Ed.

Course Co	de			С	ourse T	'itle			Leo	ture		~	
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		File System.
		OPERATING SYSTEM ISSUES
		Name Services - Domain Name System - Directory and Discovery Services -
	Unit: 4	Global Name Service - X.500 Directory Service - Clocks - Events and Process
	Ollite. 1	States - Synchronizing Physical Clocks - Logical Time And Logical Clocks -
		Global States – Distributed Debugging – Distributed Mutual Exclusion – Elections
		– Multicast Communication Related Problems.
		DISTRIBUTED TRANSACTION PROCESSING
		Transactions - Nested Transactions - Locks - Optimistic Concurrency Control -
	Unit: 5	Timestamp Ordering – Comparison – Flat and Nested Distributed Transactions –
	Onit. 5	Atomic Commit Protocols - Concurrency Control in Distributed Transactions -
		Distributed Deadlocks - Transaction Recovery - Overview of Replication And
		Distributed Multimedia Systems.
Exa	mination and Evalu	ation Pattern: It include both internal evaluation (30 marks) comprising two class
		nments/ quiz/ seminar presentation etc. and external evaluation (70 marks) which
is m	ainly end semester	examination.
Tex	t Books:	
1	George Coulouris,	Jean Dollimore and Tim Kindberg, "Distributed Systems Concepts and Design", 3rd
	Edition, Pearson E	Education, 2002.
2	Andrew S. Tanent	baum, Maartenvan Steen, Distibuted Systems, "Principles and Pardigms", Pearson
	Education, 2002	
3		use and James F.Ransome, "Cloud Computing: Implementation, Management, and
	Security", CRC Pre	ess, 2010.
Refe	erence Books:	
1	Sape Mullender, "	Distributed Systems", 2nd Edition, Addison Wesley, 1993.
2		Distributes Systems, "Software Design and Implementation", Springer, Verlag, 1994.
3	M. L. Liu, "Distribu	ited Computing Principles and Applications", Pearson Education, 2004
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PO ₁ - Engineeri investigations of sustainability, P PO ₁₂ - Life-long Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Cont	Gain surfac ng Knov f comple O ₈ - Ethic Learning PO 2 2 ents:	he l li e alg vledge s, PO	know goritl e, Pe blem 9- Inc Mapp PO2 2 2 2 1 rof vster raph vutpu	<pre>/ledge of hm, sha O₂- Pro s, PO₅- lividual of ping of of PO₃</pre> 2 2 2 2 2 1 - Rea luction ns, vide ics moint and of thm, b	of 3D o ding an blem ar Modern or team v course o PO4 2 2 2 asonable , Applic eo-disp nitors a nitives: ellipse a oundar	bject m d mapp halysis, tool usa work, PO butcom PO 5 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	models a podels a podels a podel b podel b	and appl esign/de - The eng munication program PO7 mt; 3 – S f Compu- aster-sca ons and lines, line ed area d-fill alg	y variou velopmen jineer and on, PO ₁₁ - I n outcom PO ₈ trong tren Grap in syste input de ne draw primitiv orithms	nt of sol l society, Project ma nes PO ₉ phics, ov ms, ran- evices. ring algo res: Sca	PO10 PO10 PO10 PO10 PO10 PO10 PO10 PO10	PO ₄ - (vironm nt and PO ₁₁ of gr. an sy , mid polyg	PO ₁ 2 aphics stems, -point
PO ₁ - Engineeri investigations of sustainability, P PO ₁₂ - Life-long Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Cont	Gain surfac ng Knov f comple O ₈ - Ethic Learning PO 2 2 ents:	he l li e alg vledge s, PO I I I I S g g C C C a	know goritl e, Pe blem 9- Inc Mapp PO2 2 2 2 1 rof vster raph vutpu	<pre>/ledge of hm, sha O₂- Pro s, PO₅- lividual of ping of of PO₃</pre> 2 2 2 2 2 1 - Rea luction ns, vide ics moint and of thm, b	of 3D o ding an blem ar Modern or team v course o PO4 2 2 asonable eo-dispi nitors a nitives: ellipse a	bject m d mapp halysis, tool usa work, PO butcom PO 5 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	reas of ices, ra <i>g</i> , <i>PO</i> ₆ <i>p</i> ₀ -Com <i>p</i>	and appl esign/de - The eng munication program PO7 mt; 3 – S f Compu- aster-sca ons and lines, line ed area d-fill alg Trans	y variou velopmen jineer and on, PO ₁₁ - F n outcom PO ₈ trong tter Grap an syste input de ne draw primitiv jorithms lation,	nt of sol l society, Project ma nes PO ₉ phics, ov ms, ran- evices. ving algo ves: Sca scaling	PO10 PO10 PO10 PO10 PO10 PO10 PO10 PO10	PO ₄ - (vironm nt and PO ₁₁ of gr. an sy , mid polyge	PO ₁ 2 aphics stems, -point other
PO ₁ - Engineeri investigations of sustainability, P PO ₁₂ - Life-long Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Cont	Gain surfac ng Knov f comple O ₈ - Ethic Learning PO 2 2 ents:	he l le alg he alg he alg he alg k pro- l l l l s g C C a 2	know goritl e, Pe blem 9- Inc PO2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	<pre>/ledge of hm, sha O₂- Pro s, PO₅- lividual of ping of of PO₃</pre> 2 2 2 2 2 1 - Rea luction ns, vide ics moint and of thm, b	of 3D o ding an blem ar Modern or team v course o PO4 2 2 asonable , Applic eo-disp nitors a nitives: ellipse a oundary etrical	bject m d mapp halysis, tool usa work, PO butcom PO 5 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	reas of ices, ra <i>g</i> , <i>PO</i> ₆ <i>p</i> ₀ -Com <i>p</i>	and appl esign/de - The eng munication program PO7 mt; 3 – S f Compu- aster-sca ons and lines, line ed area d-fill alg Trans	y variou velopmen jineer and on, PO ₁₁ - I n outcom PO ₈ trong tren Grap in syste input de ne draw primitiv orithms	nt of sol l society, Project ma nes PO ₉ phics, ov ms, ran- evices. ving algo ves: Sca scaling	PO10 PO10 PO10 PO10 PO10 PO10 PO10 PO10	PO ₄ - (vironm nt and PO ₁₁ of gr. an sy , mid polyge	PO ₁ 2 aphics stems, -point other
PO ₁ - Engineeri investigations of sustainability, P PO ₁₂ - Life-long Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Cont	Gain surfac ng Knov f comple O ₈ - Ethic Learning PO 2 2 ents:	he l li e alg vledge s, PO I I I I I S g C C C C a 2 t t t	know goritl e, Pe blem 9- Inc PO2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	ledge of hm, sha O ₂ - Pro s, PO ₅ - lividual of PO ₃ 2 2 2 2 1 - Ree luction ns, vide ics mot at prin and of thm, b geome ormatic	of 3D o dding an blem ar Modern or team v course o PO4 2 2 2 asonable 2 2 asonable course a nitives: ellipse a oundary etrical ons, ons betw	bject m d mapp halysis, tool usa work, PO butcom PO 5 2 2 2 2 2 2 2 2 2 2	models a sing etc poge, pog- D ge, poge, Poge es with POge grand poge gnifica gnifica reas of ices, ra k stati and ms. Fillo forms: repre- pordina	and appl esign/de - The eng munication program PO7 PO7 nt; 3 – S f Computaster-sca ons and lines, lite ed area id-fill alg Trans esentatio te system	y variou velopmer ineer and on, PO ₁₁ - F n outcom PO ₈ trong ter Grap an syste input de ne draw primitiv corithms lation, ns and ns.	nt of sol l society, Project ma nes PO9 phics, ov ms, ran- evices. ving algo ves: Sca scaling homoge	PO10 PO10 PO10 rerview dom sc prithms n line , rota eneous	PO ₄ - (vironm nt and PO ₁₁ of gr an sy , mid polyge tion, coord	PO1 2 aphics stems, -point on fill other
PO ₁ - Engineeri investigations of sustainability, P PO ₁₂ - Life-long Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Cont	Gain surfac ng Knov f comple O ₈ - Ethic Learning PO 2 2 ents:	he l li e alg vledge s, PO I I I I I S g C C C C a 2 t t t	know goritl e, Pe blem 9- Inc PO2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	ledge of hm, sha O ₂ - Pro s, PO ₅ - lividual of PO ₃ 2 2 2 2 1 - Ree luction ns, vide ics mot at prin and of thm, b geome ormatic	of 3D o dding an blem ar Modern or team v course o PO4 2 2 2 asonable 2 2 2 asonable course a nitives: ellipse a oundary etrical ons, ons betw	bject m d mapp halysis, tool usa work, PO butcom PO 5 2 2 2 2 2 2 2 2 2 2	models a sing etc poge, pog- D ge, poge, Poge es with POge grand poge gnifica gnifica reas of ices, ra k stati and ms. Fillo forms: repre- pordina	and appl esign/de - The eng munication program PO7 PO7 nt; 3 – S f Computaster-sca ons and lines, lite ed area id-fill alg Trans esentatio te system	y variou velopmer ineer and on, PO ₁₁ - F n outcom PO ₈ trong ter Grap an syste input de ne draw primitiv corithms lation, ns and ns.	nt of sol l society, Project ma nes PO9 phics, ov ms, ran- evices. ving algo ves: Sca scaling homoge	PO10 PO10 PO10 rerview dom sc prithms n line , rota eneous	PO ₄ - (vironm nt and PO ₁₁ of gr an sy , mid polyge tion, coord	PO1 2 aphics stems, -point on fill other
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PO1- Engineeri investigations c sustainability, P PO12- Life-long Course Outcomes CO1 CO2 CO3 CO4 Detailed Cont	Gain surfac ng Knov f comple O ₈ - Ethic Learning PO 2 2 ents:	he l la e alg dedge x proc N H H S S S C C C C C C C C C C C C C C C	know goritl e, P 4 blem ⁹⁻ Inc 2 2 2 2 2 2 2 2 2 2	ledge of hm, sha O ₂ - Pro s, PO ₅ - lividual of PO ₃ 2 2 2 2 1- Rea luction ns, vide ics motion thm, b geome formation formation formation wiewing ww to v	of 3D o ding an blem ar Modern or team v course o PO4 2 2 2 asonable course a course	bject m d mapp halysis, tool usa work, PO DUCOM PO 5 2 2 2 2 2 2 2 2 2 2	reas of ingerse poge, PO ₆ ho-Com post with PO ₆ gnifica reas of ices, ra k stati and floo forms: repre- pordina g pipe dinate	and appl esign/de - The eng munication program PO7 PO7 mt; 3 – S f Compute aster-sca ons and lines, line ed area ud-fill alg Trans esentatio te system cline, vie transfor	y variou velopmen jineer and on, PO ₁₁ - I n outcom PO ₈ trong ter Grap in syste input de ne draw primitiv orithms lation, ns and ns. ewing c	nt of sol l society, Project ma nes PO ₉ phics, ov ms, ran- evices. ring algo ves: Sca scaling homoge oordinat	PO10 PO10 PO10 PO10 PO10 PO10 PO10 PO10	PO ₄ - (vironm nt and PO ₁₁ of gran sy , mid polyge tion, coord rence ons, f	PO1 2 aphics stems, -point other linates, frame, Cohen-

		3-D object representation: Polygon surfaces, quadric surfaces, spline
	Unit: 3	representation, Hermite curve, Bezier curve and B-Spline curves, Bezier and B-
		Spline surfaces. Basic illumination models, polygon rendering methods.
		3-D Geometric transformations : Translation, rotation, scaling, reflection and
	T.T., 14	shear transformations, composite transformations.
	Unit: 4	3-D viewing: Viewing pipeline, viewing coordinates, view volume and general projection transforms and clipping.
		Visible surface detection methods: Classification, back-face detection, depth-
		buffer, scan-line, depth sorting, BSP-tree methods, area sub-division and octree
	Unit: 5	methods
	Unit. 5	Computer animation: Design of animation sequence, general computer
		animation functions, raster animation, computer animation languages, key frame
		systems, motion specifications.
		ation Pattern: It include both internal evaluation (30 marks) comprising two class
	, 0	ments/ quiz/ seminar presentation etc. and external evaluation (70 marks) which
is m	ainly end semester	examination.
Text	t Books:	
1	Computer Graphic	es C version", Donald Hearn and M.Pauline Baker, Pearson Education.
2	Computer Graphic	cs Principles & practice", second edition in C, Foley, VanDam, Feiner and Hughes,
	Pearson Education	l.
Refe	erence Books:	
1	Principles of Com	outer Graphics, Shalini Govil, Pai, 2005, Springer
2	Computer Graphic	es, Steven Harrington, TMH

Course C	ode				Co	ourse T	itle			Leo	cture	Sam	100to
BTCS616I	PET			Ad	vanced	Operat	ing Syste	ems		L	T P		nester: VI
Version: 1.2				Date of			n BoS 17-			3	1 0		۷ ۱
	Scheme o	of In	stru	uction				S	cheme	of Exan	nination		
No. of	Periods	:	60	Hrs.					N	laximur	n Score	: :	100
Period	s/Week	:	4						Inte	rnal Eva	aluation	: :	30
	Credits	:	4							End Se	emester	: '	70
Instructio	on Mode	:	Lee	cture]	Exam D	uration	: :	3 Hrs.
Prerequisite(s): Operati	ng S	Syste	ems									
Course Object			i i										
1. To define,	explain, a	and	app	ly intro	ductory	y opera	ting syst	ems coi	ncepts:	process	s manage	ement.	inter-
process co											-		
2. To utilize	the UNIX	ope	rati	ng syste	em inte	rface to	implem	ent a us	er-leve	l shell i	n the C l	angua	ge.
3. To design	and imple	eme	nt a	correc	t concu	rrent p	rogram i	requirin	g synch	ronizat	ion.		
4. To impart	the conce	ept (of re	eal time	operat	ing syst	tem and	their cla	assificat	ions.			
Course Outco	mes (CO):												
COs No.					St	tateme	nt				Марр	ed Pro	ogram
											Outo	omes	(POs)
CO ₁							ile mana	0				PO ₁ , PO	2
CO_2	Gain th	e kn	owl	edge of	distrib	uted op	erating	systems				PO_2	
CO ₃	Evaluat	e th	e de	esign iss	sues of 1	multipr	ocessor	operatii	ng syste	m		PO ₆	
CO ₄	Compar	re va	ario	us opera	ating sy	stems s	uch as re	eal time,	batch (OS etc.		PO_2	
PO1- Engineeri													
investigations of													
sustainability, PO		PO ₉ -	- Ind	ividual c	or team w	vork, PO	10- Comm	unicatio	n, PO 11- I	Project n	nanageme	ent and	finance
PO ₁₂ - Life-long l	Learning	м	onn	ingofo	011700.0	utcom	og with r	rodrom	outoon	200			
Course		IVI	app	ing of c	ourse o	butcome	es with p	rogram	outcon	lies	1		DO
Course Outcomes	PO ₁	P	O ₂	PO ₃	PO_4	PO ₅	PO ₆	PO ₇	PO ₈	PO ₉	PO ₁₀	PO ₁₁	
CO ₁	2		2										2
CO							2						
			2				2						
CO ₃		2	2				2						
		2		1 - Dee	sonable	· 2 - Si		+ 3 - Sta	rong				
CO ₃ CO ₄		2	2	1 – Rea	sonable	e; 2 – Si	2 gnifican	t; 3 – Str	rong				
CO ₃			2				gnifican	•	Ŭ	Design	approac	hes: la	avered
CO ₃ CO ₄		2 2 In	2 2 troc	luction	: Funct	tions of	gnifican f operat	ing sys	tems, I		approac		
CO ₃ CO ₄		22 22 In ke	2 2 troc	luction based	: Funct and virt	tions of tual mac	gnifican f operat	ing sys proach, t	tems, I types of	advanc	ed operation		
CO ₃ CO ₄ Detailed Cont	ents:	In ke (N	2 2 troc rnel OS,	luction based a DOS, N	: Funct and virt Iultipro	tions of tual mac cessor	gnifican f operat chine app OS, Mob	ing sys proach, 1 ile OS, 1	tems, I types of RTOS, C	advano Cloud O	eed opera S)	ating s	ystems
CO ₃ CO ₄	ents:	In ke (N Ur	2 2 troc rnel OS, nix	luction l based a DOS, N Kernel	: Funct and virt Iultipro and I	tions of tual mac cessor File Ma	gnificant f operat chine app OS, Mob anageme	ing sys proach, † pile OS, I ent: Sys	tems, I types of RTOS, C stem S	advano Cloud O tructur	ed operation	ating s Persp	ystems bective
CO ₃ CO ₄ Detailed Cont	ents:	In ke (N Ur Ar	2 trođ rnel OS, nix chit	luction l based a DOS, M Kernel ecture	: Funct and virt Iultipro and I of Uni	ions of ual mac cessor F ile Ma x Oper	gnificant f operat chine app OS, Mob anageme rating Sy	ing sys proach, t bile OS, l ent: Sys ystem, 1	tems, I types of RTOS, C stem S Buffer o	advanc cloud O tructur cache:	ced opera S) e, User	ating s Persp Buffe	ystems bective r Pool
CO ₃ CO ₄ Detailed Cont	ents:	In ke (N Ur Ar Re file	trođ rnel OS, ix chit trie D	luction l based a DOS, M Kernel ecture ving, Re irector	: Funct and virt Iultipro and I of Uni eading a ies, Pat	tions of ual mac cessor F ile Ma x Oper and Wri th con	gnificant f operat chine app OS, Mob anageme rating Sy ting Buff	ing sys proach, f ile OS, I ent: Sys ystem, I fer. File	tems, I types of RTOS, C stem S Buffer of Represe	advanc Cloud O tructur cache: entatior	eed opera S) e, User Header,	eting s Persp Buffe Struc	ystems bective r Pool cture of
CO ₃ CO ₄ Detailed Cont	ents:	In ke (N Ur Ar Re file all	2 2 troc 7 nix chit trie e D ocat	luction l based a DOS, M Kernel ecture ving, Re irector tion of	: Funct and virt Iultipro and I of Uni eading a ies, Pat disk blo	tions of ual mac cessor File Ma x Oper and Wri th con cks	gnificant f operat chine app OS, Mob anageme rating Sy ting Buff version	ing sys proach, t ile OS, I ent: Sys ystem, 1 fer. File to inoc	tems, I types of RTOS, C stem S Buffer o Represe le, sup	advance advance advance cache: cache: entation erblock	ced opera S) e, User Header, n: inodes c, inode	Persp Persp Buffe Struc assig	ystems bective r Pool ture of nment
CO ₃ CO ₄ Detailed Cont	ents:	In ke (N Ur Ar Re fild all Ur	2 trod rnel OS, nix chit trie e D ocat	luction l based a DOS, M Kernel ecture ving, Re irector tion of o Process	: Funct and virt fultipro and I of Uni eading a ies, Pat disk blo and M	ions of ual mac cessor File Ma x Oper and Wri th con cks emory	gnificant f operat chine app OS, Mob anageme rating Sy ting Buff version manage	ing sys proach, i ile OS, I ent: Sys ystem, I fer. File i to inoc ment: D	tems, I types of RTOS, C stem S Buffer o Represe de, sup	advance advance cloud O tructur cache: entation erblock design	ced opera S) e, User Header, h: inodes c, inode	Persp Buffe Struc assig	ystems pective r Pool ture of nment ucture
CO ₃ CO ₄ Detailed Cont	ents:	In ke (N Ur Ar Re file all Ur Ke	2 troc rnel OS, nix chit trie e D ocat nix I erne	luction l based a DOS, M Kernel ecture ving, Re irector tion of e Process l Data s	: Funct and virt fultipro and I of Uni eading a ies, Pat disk blo and M tructure	ions of ual mac cessor File Ma x Oper and Wri th con cks emory es for p	gnificant f operat chine app OS, Mob anageme rating Sy ting Buff version manage rocess, S	ing sys proach, i ile OS, I ent: Sys ystem, I fer. File to inoc ment: D	tems, I types of RTOS, C stem S Buffer of Represe Ie, sup retailed e of Uar	advance cloud O tructur cache: entation erblock design ea and 1	ed opera S) e, User Header, h: inodes c, inode of Proce	Persp Buffe Struc assig	ystems pective r Pool ture of nment ucture Process
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	Mobile OS: Architecture, Android OS, iOS, Virtual OS, Cloud OS and their design											
	issues											
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sess	ional exams/ assignments/ quiz/ seminar presentation etc. and external evaluation (70 marks) which											
is m	ainly end semester examination.											
Text	t Books:											
1	Charles Crowley, "Operating Systems: A Design-Oriented Aproach", Tata McGraw Hill Education".											
2	Stuart E. Madnick & John J. Donovan. Operating Systems. McGraw Hill											
Refe	erence Books:											
1	Harvey M Dietel, " An Introduction to Operating System", Pearson Education											
2	D M Dhamdhere, "Operating Systems :A Concept basedAproach", McGraw Hill											

Course C					ourse Ti					ture	Sem	ester:
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Course Object												
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		Debugging with benchmarking Real-time system software – basics of contemporary RTOS – VXWorks, UC/OS-II
		Interfacing with Embedded Controller
		Programmable interface with A/D & D/A interface; Digital voltmeter, control-
		Robot system; - PWM motor speed controller, serial communication
	Unit: 5	interface. Standard single purpose processor's peripherals: timers, counters, watchdog timers, UART, LCD controllers, keypad controllers.
		Applications: Digital camera-washing machine-cell phones-home security
		systems-finger print identifiers-cruise control-printers Automated teller
		machine
		ation Pattern: It include both internal evaluation (30 marks) comprising two class
		ments/ quiz/ seminar presentation etc. and external evaluation (70 marks) which
is m	ainly end semester o	examination.
Tex	t Books:	
1	Steven F. Barrett, D	Daniel J. Pack, "Embedded Systems – Design and Applications with the 68HC
	12 and HCS12", Pea	rson Education, 2008.
2	Raj Kamal, "Embe	dded Systems- Architecture, Programming and Design" Tata McGraw
	Hill,2006.	
Refe	erence Books:	
1	Daniel W. Lewis, "I	Fundamentals of Embedded Software", Prentice Hall India, 2004.
2	Jack R Smith "Prog	ramming the PIC microcontroller with MBasic" Elsevier, 2007.

Course Code		Course Tit	le	Lec	ture		Som	oator
BTCS711PET		Artificial Intelligence			Т	Р		ester:
Version: 1.2		Date of Approval: 16th	BoS 17-11-2022	3	1	0		V 11
Scheme of	f In	struction	Sche	me of Ex	amina	ntior	1	
No. of Periods	:	60 Hrs.		Maximu	m Sco	re	:	100
Periods/ Week	:	4	Int	ernal Ev	aluatio	on	:	30
Credits	:	4		End S	emest	er	:	70
Instruction Mode	:	Lecture		Exam I	Duratio	on	:	3 Hrs.
Prerequisite(s): Comput	er /	Architecture & Organizati	ion					

Course Objectives:

1. To understand the concept of intelligent human behaviors on a computer.

2. To learn the concept of Artificial intelligence, include: problem solving, reasoning, planning, natural language understanding, computer vision, automatic programming, and machine learning.

3. To learn and possess a firm grounding in the existing techniques and component areas of Artificial Intelligence.

4. To apply this knowledge to the development of Artificial Intelligent Systems and to the exploration of research problems.

Course Outcon	nes (CO):	
COs No.	Statement	Mapped Program Outcomes (POs)
CO ₁	Understand the concept of intelligent human behaviors on a computer	PO ₁ , PO ₂
CO ₂	Be familiar with techniques for computer-based representation and manipulation of complex information, knowledge, and uncertainty.	PO ₂ , PO ₄
CO ₃	Gain awareness of several advanced AI applications and concepts	PO ₂ , PO ₉
CO ₄	Apply various machine learning algorithms to solve real-life problem.	PO ₃ , PO ₅ , PO ₉
DO Engineerin	v Knowledge DO Droblem englygig DO Degign (development of gelyt	tiona DO Conduct

 PO_1 - Engineering Knowledge, PO_2 - Problem analysis, PO_3 - Design/development of solutions, PO_4 - Conduct investigations of complex problems, PO_5 - Modern tool usage, PO_6 - The engineer and society, PO_7 - Environment and sustainability, PO_8 - Ethics, PO_9 - Individual or team work, PO_{10} - Communication, PO_{11} - Project management and finance, PO_{12} - Life-long Learning

		Mappi	ing of c	ourse o	utcom	es wit	h prog	ram ou	tcomes			
Course Outcomes	PO ₁	PO ₂	PO ₃	PO ₄	PO ₅	PO 6	PO ₇	PO ₈	PO ₉	PO ₁₀	PO ₁₁	PO ₁₂
CO ₁	2	2										
CO ₂		2		2								
CO ₃		2							1			
CO ₄			2		2				1			
			1 – Rea	sonable	; 2 – Si	gnific	ant; 3 ·	- Stron	9			
Detailed Conten	ts:											

Unit: 1	Introduction : Introduction to Artificial Intelligence, Foundations and History of Artificial Intelligence, Applications of Artificial Intelligence, Intelligent Agents, Structure of Intelligent Agents. Computer vision, Natural Language Possessing.
Unit: 2	Introduction to Search : Searching for solutions, Uniformed search strategies, Informed search strategies, Local search algorithms and optimistic problems, Adversarial Search, Search for games, Alpha – Beta pruning.
Unit: 3	Knowledge Representation & Reasoning: Propositional logic, Theory of first order logic, Inference in First order logic, Forward & Backward chaining, Resolution, Probabilistic reasoning, Utility theory, Hidden Markov Models (HMM), Bayesian Networks.
Unit: 4	Machine Learning : Supervised and unsupervised learning, Decision trees, Statistical learning models, Learning with complete data - Naive Bayes models, Learning with hidden data - EM algorithm, Reinforcement learning.
Unit: 5	Pattern Recognition : Introduction, Design principles of pattern recognition system, Statistical Pattern recognition, Parameter estimation methods – Principle Component Analysis (PCA) and Linear Discriminant Analysis (LDA), Classification Techniques – Nearest Neighbor (NN) Rule, Bayes Classifier, Support Vector Machine (SVM), K – means clustering.

sess	mination and Evaluation Pattern: It include both internal evaluation (30 marks) comprising two class ional exams/ assignments/ quiz/ seminar presentation etc. and external evaluation (70 marks) which ainly end semester examination.
	t Books:
1	Stuart Russell, Peter Norvig, "Artificial Intelligence – A Modern Approach", Pearson Education.
2	Elaine Rich and Kevin Knight, "Artificial Intelligence", McGraw-Hill.
Refe	erence Books:

E Charniak and D McDermott, "Introduction to Artificial Intelligence", Pearson Education. 1

Dan W. Patterson, "Artificial Intelligence and Expert Systems", Prentice Hall of India. 2

	e Cod	e			(Course '	Title			Le	cture	Sem	nester:
BTCS7	12PE	Г			Block	Chain T	echnolog	gy		L	Т Р	· ·	VII
Version: 1.2	2			Date o				-11-2022		3	1 0		
	Sc	heme o	f Instr	uction				Scl	neme of	Exam	ination		
No	o. of P	eriods	:	60 Hrs.					Max	kimun	n Score	:	100
Peri		Week	-	4							luation	:	30
		redits	:	4							mester	:	70
Instru	ction	Mode	:	Lecture	9				Ex	am Di	uration	:	3 Hrs.
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Course Obj													
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CO1 CO2 CO3 CO4 Detailed Co Un Uni	onten it: 1	2	PO ₂ 2 2 2 Intro Tech Block Digit Cons its an Naka Abstr (PoV treat Chain Block Lifec Actor regul Block	PO ₃ 1 – Rea duction nology, s, Blocl al Signa ensus H nalysis – moto C ract Moo V) as rar ment of ns – Hyt cchain ycle of I rs of Bla ator, B cchain A duction	PO ₄ 2 sonable n to I Types kchain, ture, Di Problem Consens dels for ndom or f consis prid moo Workin Blockcha ilockcha ilockcha ilockcha ilockcha	PO ₅ ; 2 - Si Blockch of netv PKI and gital Tc a - Asym us on p BLOCK acle - f tency, dels (Pc ng: Blo ain, Sm n, Bloc in user ion tcoin: F	PO ₆ gnificant ain: Ba work, Co d Crypto oken, Cry ochronou ccHAIN - formal liveness oW + Pos ock, Has art Cont kchain co c, Memb Bitcoin, T	PO ₇ ;; 3 – Stro sics of omponent graphy: F ptocurre is Byzanti on-less, r - GARAY r and fairm	PO ₈ ng Blockcl s of Bl Private I ncy. ne Agree ameless nodel - ess - P ture of sensus A , Blockcc ervice p locks, N	PO 9 1 1 cemen s, pee RLA M roof c Bloc Algorit chain o rovide	Distribu ain or D Public K t - AAP r-to-pee lodel - F of Stake kchain, thm, Fau operator er, Build	uted DLT, I eys, H protoc er net Proof o (PoS) Distr ilt Tole r, Bloc ling A hardr	Ledge Ledge Ledge Ledge Iashin col an work of Wor base ibute erance kchai

	Unit: 5	Ethereum - Ethereum network, Ethereum Virtual Machine (EVM), Wallets for Ethereum, Solidity - Smart Contracts, some attacks on smart contracts, Design and issue Cryptocurrency.
Exar	mination and Evalua	ation Pattern: It include both internal evaluation (30 marks) comprising two class
sess	ional exams/ assign	ments/ quiz/ seminar presentation etc. and external evaluation (70 marks) which
is m	ainly end semester e	examination.
Text	t Books:	
1		, Joseph Bonneau, Edward Felten, Andrew Miller, and Steven Goldfeder, "Bitcoin cy Technologies: A Comprehensive Introduction", Princeton University Press,
2	Arshdeep Bahga a	nd Vijay Madisetti, "Blockchain Application: A Hnads-on Approach".
Refe	erence Books:	
1	Xiwei (Sherry) Xu,	Ingo Weber and Mark Staples "Architecture for Blockchain Applications", Springer.
2	Andreas Antonopo	oulos, "Mastering Bitcoin", O'Reilly' Publisher.

Course Co					urse Ti					ture		
BTCS713P	ET				Time Sy					Т Р	Seme	ster: VII
Version: 1.2				Approv	7 al: 16th	BoS 17-			3	1 0		
	Scheme o						S			minati	on	•
	Periods		Hrs.						aximum		:	100
Periods	/ Week	: 4							nal Eval		:	30
	Credits	: 4							End Sei	nester	:	70
Instructio	on Mode	: Lee	cture					Е	xam Dı	iration	:	3 Hrs.
Prerequisite(s)		led Syst	em									
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CO ₂						al-time s				_	PO	-
CO ₃				gn docu	iment o	on an ar	chitect	ıral de	esign of	fa	PO _{3,} 1	PO_6
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Course	PO ₁	PO ₂	PO ₃	PO ₄	PO ₅	PO ₆	PO ₇	РО	PO ₉	PO ₁₀	PO ₁₁	PO ₁₂
Outcomes								8		10		12
<u>CO1</u>	2	-										
		2										
CO ₃			2			2						
CO ₄			2	11					1			
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Detailed Conte		Level Const Mode of Rea	Contro traints, els for Re	ols, Sigr Hard R eal Time Worklo	nal Proc eal Tim e Syster	ypical Re cessing e ne System ns: Proce iodic Ta	etc., Rel ms and essors a	lease 7 Soft F nd Res	Fimes, Real Tin sources	Deadlin ne Syste , Tempo	es, and ems, Re oral Par	Timing ference ameters
Unit: 2 Unit: 3		Driver Dynar and Lo Versu Driver Resou (RAC). Priori Priori	n Appro nic Ver east-Sla s Onlin <u>n and C</u> urces Sh , Non- ty-Ceili ty-Ceili	ach, W sus Sta ick-Tim e Scheo lock Dr aaring: I preemp ng Pro ng Pro	eighted atic Sys ae-First duling, s iven Sys Effect o otive C tocols, tocol in	f Resour critical Stack n Dynai	Robin A ptimalit gorithm ing Ape ce Cont Section Based nic Pri	Approa y of E s, Rate riodic centior s, Bas Priorit	ch, Prie Effective Monot and Sp and Re sic Pri y- Cei System	ority Dr e-Deadl conic Alg ooradic esource ority-In ling Pre-	iven Ap ine-Fir gorithm jobs in Access heritan otocol, mption	oproach st (EDF , Offling Priority Contro ce and Use o Ceiling
Unit: 4		Acces	ses to E	oata Ob	jects. lication	Multiple	Concept	s in R	eal time	e Comm	unicati	on, Sof

		Switched Networks, Medium Access Control Protocols for Broadcast Networks,
		Internet and Resource Reservation Protocols.
	Unit: 5	Real Time Operating Systems and Databases: Features of RTOS, Time Services, UNIX as RTOS, POSIX Issues, Characteristic of Temporal data, Temporal Consistency, Concurrency Control, Overview of Commercial Real Time databases.
sessi		Ation Pattern: It include both internal evaluation (30 marks) comprising two class ments/ quiz/ seminar presentation etc. and external evaluation (70 marks) which examination.
Text	Books:	
1	Real Time Systems	by Jane W. S. Liu, Pearson Education Publication
Refe	rence Books:	
1	Mall Rajib, "Real 7	Time Systems", Pearson Education
2	Albert M. K. Cheng	, "Real-Time Systems: Scheduling, Analysis, and Verification", Wiley.

Course Co			Course TitleLecturAd-Hoc and Sensor NetworkLTDate of Approval: 16th BoS 17-11-202231								:	Sen	nester:
BTCS714P	ET									Т	Р		VII
Version: 1.2				Approval	l: 16th	BoS 17-	11-202		3	1	0		VII
		of Instr	uction					Schem	ne of Ex	amin	atio	ı	
No. of	Periods	: 6	0 Hrs.					1	Maximu	m Sc	ore	:	100
Periods	/ Week	: 4						Inte	ernal Ev	aluat	ion	:	30
	Credits	: 4							End S	lemes	ster	:	70
Instructio	n Mode	: L	ecture						Exam I	Durat	ion	:	3 Hrs.
Prerequisite(s)	Python	Program	mming										
Course Objecti	ves:												
1. To learn Ad	l-hoc w	ireless I	nternet,	, MAC pro	otocol	s for Ad	hoc W	/ireless	Netwo	rks Is	sues	in De	signing
a MAC Pro	tocol for	· Ad hoc	Wireles	ss Netwo	orks.								
2. To underst	and the	Basics	of W	/ireless, S	Sensor	s and	Арр	lication	s: The	Mic	a N	Aote, S	Sensing
and Comm													
Data Retrie					C		•		U				
3. To provide	the con	ncept of	classifi	cation of	f WSN:	s, MAC	layer,	Routing	g layer,	Trans	spor	t layer	, High-
level applic												5	, 0
4. To acquire							5						
Course Outcon		-		0 ;									
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0001101													s (POs)
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				antine a	f MICN		C 1		+im or 1 ==			PO ₃ , P	0
CO ₃				cation o								PO3, P	010
										c + o			
				-level ap			er sup	port, A	dapting	g to			
	the inl	erent d	ynamic	nature o	of WSN	ls.						0 00	DO
CO ₄	the inl Design	erent d and in	ynamic		of WSN	ls.					I	PO3, PO	4, PO 9
	the inl Design sensor	erent d and in s.	ynamic mpleme	nature o nt the a	of WSN applica	ls. ation o	f oper	ating	system	in		,	
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PO ₁ - Engineerin investigations of	the inl Desigr sensor g Knowl complex	erent d and in s. edge, P problem	ynamic mpleme O ₂ - Prot s, PO 5- M	nature of nt the a olem anal Modern to	of WSN applica lysis, P ool usag	Is. ation o PO 3- De ge, PO 6-	f oper sign/d The en	ating evelopm gineer a	system ent of nd socie	in soluti ety, PC	ions, D 7- E1	PO ₄ -	Conduct nent and
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	Challenges in Security Provisioning, Networks Security Attacks, Key Management, Secure Routing in Ad hoc Wireless Networks.
Unit: 4	Basics of Wireless, Sensors and Applications: The Mica Mote, Sensing and Communication Range, Design Issues, Energy consumption, Clustering of Sensors, Applications Data Retrieval in Sensor Networks s: Classification of WSNs, MAC layer, Routing layer, Transport layer, High-level application layer support, Adapting to the inherent dynamic nature of WSNs.
Unit: 5	 Sensor Networks Hardware: Components of Sensor Mote, Operating System in Sensors- TinyOS, LA-TinyOS, SOS, RETOS Imperative Language: nesC, Dataflow style language: TinyGALS, Node-Level Simulators, ns-2 and its sensor Networks extension, TOSSIM.
	aluation Pattern: It include both internal evaluation (30 marks) comprising two class
is mainly end semes	signments/ quiz/ seminar presentation etc. and external evaluation (70 marks) which ter examination.
Text Books:	
	is Cordeiro and Dharma Prakash Agrawal, "Ad Hoc and Sensor Networks: Theory and Second Edition, World Scientific Publishers, 2011.
Reference Books:	
1 Kazem Sohraby Publication, 20	y, Daniel Minoli, Taieb Znati, "Wireless Sensor Networks s', A John Wiley & Sons Inc. 07.
	patra and Sriramamurtyhy, "Ad Hoc Networks s: Technologies and Protocols", national Edition, 2009.

Course Co				-	ourse T				Lec	ture	Sen	nester:
BTCS715P1	ET				net-of-				L	ΤP		VII
Version: 1.2			Date o	f Appro	val: 16t	h BoS 17	-11-2022		3	1 0		V II
5	Scheme o	f Instru	iction				Sch			ination	1	
No. of	Periods	: 60) Hrs.					Ма	ximum	Score	:	100
Periods	/ Week	: 4						Interr	nal Eval	uation	:	30
	Credits	: 4						I	End Ser	nester		70
Instructio	on Mode	: Le	ecture					E	xam Du	ration	:	3 Hrs.
Prerequisite(s):	It is expe	ected th	at the s	student	s have c	lone BTC	CS711ET at	nd BTC	CS714PE	ET cours	ses.	
Course Objectiv	ves:											
1. To understa	and the co	oncepts	s of Inte	ernet of	Things	and can	able to b	uild Io'	T applie	cations		
2. To learn the	e architec	ture an	d appli	cations	of IoT.							
3. To learn the	e importa	nce of j	python	for the	implem	entation	n of IoT.					
4. To impart t	he knowle	edge of	challer	nges in I	oT and	their po	ssible sol	utions.				
Course Outcom	es (CO):	Ŭ		0		-						
COs No.				S	tateme	nt				Map	ped Pr	ogran
											- comes	
CO ₁	Underst	and th	e impa	ict and	challer	nges po	sed by Ic	oT net	works		PO ₁ , PO	D_2
	leading					-	-					
CO ₂	Analyze	the	role o	of IoT	proto	ocols fo	or efficie	ent ne	etwork		PO ₂ , PO	D 5
	commu	nicatior	l									
CO ₃	Elaborat	te the n	leed for	· Data A	nalytics	and Sec	curity in I	Τо			PO ₃ , PO	
CO ₄							nsing rea		l	PO	O ₃ , PO _{9,}	PO ₁₀
	entities	and ide	entify th	ne applie	cations	of IoT in	ı Industry	•				
PO1- Engineering												
investigations of	complex p	roblems	, PO 5- N	íodern t	ool usag	е, РО 6- Т	he engine	er and s	society,	PO ₇ - En	vironm	ent an
sustainability, PO	s- Ethics, P	∙O 9- Indi	vidual or	r team w	ork PO	o- Commi	unication. I		oioot m		ent and	finance
POw- Life-long L	· · · · · · · · · · · · · · · · · · ·				0110, - 010		annouron, .	PU11- PI	OJECT III	inageme		
r Ol2- Life-long Le	earning				0111, 2 01	-		P U 11- P1	oject ma	anageme		
	arning	Маррі					rogram ou		•	inageme		
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	PO ₁	Mappi PO2						utcome	•	PO ₁₀	1	PO
Course			ng of c	ourse o	utcome	s with p	rogram oi	utcome PO	es		PO ₁	PO
Course Outcomes	PO ₁	PO ₂	ng of c	ourse o	utcome	s with p	rogram oi	utcome PO	es		PO ₁	PO
Course Outcomes CO ₁	PO ₁	PO ₂	ng of c	ourse o	utcome PO5	s with p	rogram oi	utcome PO	es		PO ₁	PO
Course Outcomes CO ₁ CO ₂	PO ₁	PO ₂	ng of co PO ₃	ourse o	PO ₅	s with p	rogram oi	utcome PO	es		PO ₁	PO
Course Outcomes CO1 CO2 CO3	PO ₁	PO ₂ 2 2	ng of co PO ₃ 2 2	PO4	PO ₅	s with p PO ₆	PO7	PO 8	PO ₉	PO ₁₀	PO ₁	PO
$\begin{array}{c} Course \\ \hline Outcomes \\ \hline CO_1 \\ \hline CO_2 \\ \hline CO_3 \\ \hline CO_4 \end{array}$	PO1 2	PO ₂ 2 2	ng of co PO ₃ 2 2	PO4	PO ₅	s with p PO ₆	rogram oi	PO 8	PO ₉	PO ₁₀	PO ₁	PO
$\begin{array}{c} Course \\ \hline Outcomes \\ \hline CO_1 \\ \hline CO_2 \\ \hline CO_3 \\ \hline CO_4 \end{array}$	PO1 2	PO ₂ 2 2	ng of co PO ₃ 2 2 1 - Rea	PO4	utcome PO₅ 1 2 ; 2 - Sig	s with p PO ₆ nificant	PO7 PO7 ; 3 – Stron	PO 8	es PO 9	PO ₁₀	PO ₁	
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$\begin{array}{c} Course\\ \hline Outcomes\\ \hline CO_1\\ \hline CO_2\\ \hline CO_3\\ \hline CO_4\\ \end{array}$	PO1 2	PO ₂ 2 2 Introd design	ng of co PO ₃ 2 2 1 - Rea luction to o f IoT, J	PO4 PO4 sonable to IoT: E	PO5 PO5 1 2 ; 2 - Sig Defining balblocks	s with pr PO ₆ nificant	PO7 PO7 ; 3 – Stron acteristics Communica	atcome PO 8 ng of IoT,	PO9 1 Physica odels &	PO ₁₀	PO ₁ 1	Logica
Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conter	PO1 2	PO ₂ 2 2 Introd design	ng of co PO ₃ 2 2 1 - Rea luction to of loT, 1 M2M: N	PO4 PO4 sonable to IoT: E	PO5 PO5 1 2 ; 2 - Sig Defining balblocks	s with pr PO ₆ nificant	PO7 PO7 ; 3 – Stron	atcome PO 8 ng of IoT,	PO9 1 Physica odels &	PO ₁₀	PO ₁ 1	Logica
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Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conter	PO1 2	PO2 2 2 Introd design IoT & Netwo survey	ng of co PO ₃ 2 2 1 - Rea luction to of loT, 1 M2M: Nork rk & Co , Survey	PO4 PO4 sonable to IoT: D Function Machine routing	PO5 1 2 ; 2 - Sig pefining blocks to Mach	s with pr PO ₆ mificant IoT, Char s of IoT, Char s of IoT, Char s of IoT, Char	rogram ou PO7 ; 3 – Stron acteristics Communica erence bet	atcome PO 8 1 1 1 1 1 1 1 1 1 1 1 1 1	PO ₉ PO ₉ 1 Physica odels & oT and access	PO ₁₀ 2 l design APIs M2M, S issues,	PO ₁ 1 of IoT, oftward	Logica e defin
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Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conter Unit: 1 Unit: 2	PO1 2	PO2 2 2 Introd design IoT & Netwo survey & disse Challer Challer Domai	ng of co PO ₃ 2 2 1 - Rea luction to of IoT, 7 M2M: M rk rk & Co survey eminatio enges in nges in spec	ourse of PO4 sonable sonable to IoT: D Function Machine n IoT: Desi ific app	PO5 1 2 ; 2 - Sig pefining 1 al block to Mach cation a protocol ign challe	s with pr PO6 mificant IoT, Char s of IoT, IoT, Char s of IoT, IoT, IoT, IoT, IoT, IoT, IoT, IoT,	rogram or PO7 ; 3 – Stron acteristics Communica erence bet Wireless n deployme velopment T: Home	of IoT, ation m ween I nedium nt & No	PO9 PO9 1 Physica odels & oT and access de disco	PO ₁₀ 2 1 design APIs M2M, S issues, overy, Da curity ch	PO ₁ 1 of IoT, oftward MAC µ ata aggn	Logica e defin protoco regatio s, Othe
Outcomes CO1 CO2 CO3 CO4 Detailed Conter Unit: 1 Unit: 2 Unit: 3	PO1 2	PO2 2 2 Introd design IoT & Netwo survey & disse Challer Challer Domai Survei	ng of co PO ₃ 2 2 1 - Rea luction to of IoT, 7 M2M: M ork rk & Co , Survey eminatio enges in inges in spec llance aj	PO4 PO4 sonable to IoT: D Function Machine ommuni routing n IoT: Desi ific app	PO5 1 2 3 3 4 5 5 7 5 7 5 7 5 7 5 7 7 7 7 7 7 7 7 7	s with pr PO ₆ mificant loT, Char s of IoT, C hine, Diffe Is, Sensor enges, De enges, De r IoT app	rogram or PO7 ; 3 – Stron acteristics Communica erence bet Wireless n deployme velopment T: Home lications	atcome PO 8 of IoT, ation m ween I nedium nt & No challer autom	PO9 PO9 1 Physica odels & oT and access de disco ages, Sec nation,	PO ₁₀ 2 l design APIs M2M, S issues, overy, Da curity ch. Industry	PO ₁ 1 of IoT, oftware MAC µ ata aggi allenge 7 appli	Logica e define protoco regation s, Othe cations
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	Finger print classification, signature verification, text recognition, map understanding, bio-logical cell classification.
Exa	mination and Evaluation Pattern: It include both internal evaluation (30 marks) comprising two class
	ional exams/assignments/quiz/seminar presentation etc. and external evaluation (70 marks) which
is m	ainly end semester examination.
Text	t Books:
1	Gonzalez and Wood, "Digital Image Processing", Addison Wesley, 1993.
2	Anil K.Jain, "Fundamental of Image Processing", Prentice Hall of India.
Refe	erence Books:
1	Rosenfeld and Kak, "Digital Picture Processing" vol.I&vol.II, Academic,1982
2	Ballard and Brown, "Computer Vision", Prentice Hall, 1982

Course Co	de			Co	ourse Ti	itle			Leo	cture	0	
BTCS832P	ET			Dat	ta Analy	rtics			L	Т Р		ester:
Version: 1.2			Date of	Approv	7al: 16th	BoS 17-	-11-2022	2	3	1 0	1	ΊΠ
S	cheme o			••					of Exa	minatio	1	
	Periods		Hrs.					М	aximur	n Score	: 1	00
	/ Week	: 4						Inter	rnal Eva	aluation	: :	30
	Credits	: 4								emester	: 7	70
Instructio	ion Mode : Lecture Exam										: :	3 Hrs.
Prerequisite(s):	Engineer	ring Ma	themati	sing								
Course Objectiv	ves:											
1. To learn the	e fundam	ental co	oncepts	of data	analyti	cs.						
2. To provide	the princ	iples ar	nd meth	ods of s	statistic	al analy	sis.					
3. To discover			erns, ar	alyze s	upervis	ed and ı	unsuper	vised m	nodels a	and estir	nate th	e
accuracy of												
4. To understa		arious s	earch n	nethods	s and vis	sualizati	on tech	niques.				
Course Outcom	es (CO):											
COs No.				S	tateme	nt					ped Pr	
										Out	comes	
CO ₁	Explain						ysis				PO ₁ , PO) ₂
CO ₂	Interpre	et the p	robabili	stic mo	dels for	· data					PO ₂	
CO ₃	Illustrat					inciple					PO ₃	
CO ₄	Demons										PO ₃ , PO	
PO1- Engineering												
investigations of o sustainability, PO 8 PO 12- Life-long Le	- Ethics, P											
		Mappi	ng of co	ourse ou	itcome	s with p	rogram	outcon	nes			
Course	DO									ЪО	DO	PO ₁
Outcomes	PO ₁	PO ₂	PO ₃	PO ₄	PO ₅	PO ₆	PO ₇	PO ₈	PO ₉	PO ₁₀	PO ₁₁	2
CO ₁	2	2										
CO ₂		2										
CO ₃			2									
CO ₄			2		2							
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Detailed Conter	nts:											
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					Probabi	lity D	istribu	tions:	Introd	uction.	Proba	ability
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		Proba Essen	bility tials, Ru	and I ule of C	Compler	nents, A	Addition	Rule, O	Conditi		babilit	y and
Unit: 2		Proba Essen the M	bility tials, Ru Iultiplic	and I ile of C ation R	Compler Rule, Pr	nents, A obabilis	Addition tic Inde	Rule, Cepender	Conditi nce, Eq	onal Pro	babilit kely Ev	y and vents,
Unit: 2		Proba Essen the M Subje	bility tials, Ru Iultiplic ctive Ve	and I ale of C ation R ersus Ol	Compler Rule, Pr bjective	nents, A obabilis Probab	Addition tic Inde oilities, I	Rule, G epender Probabi	Conditi nce, Eq lity Dis	onal Pro Jually Li	babilit kely Ev n of a S	y and vents, Single
Unit: 2		Proba Essen the M Subjec Rando Mean	bility tials, Ru fultiplic ctive Ve om Varia and Va	and ule of C ation R ersus Ol able, Sun riance, 1	Compler Rule, Pr bjective mmary Introdu	nents, A obabilis Probab Measure ction to	Addition tic Inde bilities, I es of a P	Rule, (epender Probabi robabili	Conditi nce, Eq lity Dis	onal Pro Jually Li tributio	babilit kely Ev n of a S	y and vents, Single
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Unit: 2 Unit: 3		Proba Essen the M Subjee Rando Mean Norm Decis Analy (EMY)	bility tials, Ru fultiplic ctive Ve om Varia and Var al Rande ion Ma sis, Paye , Sensit	and 1 ule of C ation R ersus Ol able, Sun riance, 1 om Dist king u off Tabl	Compler Rule, Pr bjective mmary Introdu cribution nder U les, Pos nalysis,	nents, A obabilis Probab Measure ction to n. Incertai sible De Decisio	Addition tic Inde pilities, I es of a P Simula nty: In ecision (n Trees	Rule, G epender Probabili robabili tion troduct Criteria	Condition nce, Eq lity Dist ity Distr ity Distr cion, El , Expec Profiles,	onal Pro jually Li tribution ribution ements eted Mon , The Pro	babilit kely Ev of a S Condi of Dee netary ecision	y and vents, Single tional cision Value Tree
		Proba Essen the M Subjec Rando Mean Norm Decis Analy (EMY) Add-I	bility tials, Ru fultiplic ctive Ve om Varia and Var al Rande ion Ma sis, Payo), Sensit n, Bayo	and 1 alle of C ation R ersus Ol able, Sun riance, 1 om Dist king u off Tabl civity Ar es' Rul	Compler Rule, Pr bjective mmary Introdu <u>cribution</u> nder U les, Pos nalysis, e, Mul	nents, A obabilis Probab Measure ction to n. Incertai sible De Decisio tistage	Addition tic Inde oilities, 1 es of a P o Simula nty: In ecision (n Trees Decisio	Rule, (epender Probabili robabili tion troduct Criteria , Risk P on Pro	Condition nce, Eq lity Distrity Distri ity District ion, El , Expect Profiles, blems	onal Pro jually Li tribution ribution ements cted Mon	babilit kely Ev n of a S Condi of Dec netary ecision e Valu	y and vents, Single tional cision Value Tree ie of

		utility Functions, Exponential Utility, Certainty Equivalents, Is Expected
		Utility Maximization Used?
	Unit: 4	Hypothesis Testing using R programming : Introduction, Concepts in Hypothesis Testing, Null and Alternative Hypothesis, One-Tailed Versus Two- Tailed Tests, Types of Errors, Significance Level and Rejection Region, Significance from p-values, Type II Errors and Power, Hypothesis Tests and Confidence Intervals, Practical versus Statistical Significance, Hypothesis Tests for a Population Mean.
	Unit: 5	Regression Analysis : Estimating Relationships: Introduction, Scatterplots : Graphing Relationships, Linear versus Nonlinear Relationships, Outliers, Unequal Variance, No Relationship, Correlations: Indications of Linear Relationships, Simple Linear Regression, Least Squares Estimation, Standard Error of Estimate, The Percentage of Variation Explained: R-Square, Multiple Regression, Interpretation of Regression Coefficients, Interpretation of Standard Error of Estimate and R-Square, Modeling Possibilities, Dummy Variables, Interaction Variables, Nonlinear Transformations, Validation of the Fit., Statistical Inference: Introduction, Assumptions, Nonconstant Error Variance, Nonnormality of Residuals, Autocorrelated Residuals, Prediction.
Exa	mination and Evalua	tion Pattern: It include both internal evaluation (30 marks) comprising two class
		nents/ quiz/ seminar presentation etc. and external evaluation (70 marks) which
	ainly end semester e	xamination.
	t Books:	
1		David J. Hand, "Intelligent Data Analysis", Springer, 2007.
2		p: The Definitive Guide" Third Edition, O'reilly Media, 2012
Refe	erence Books:	
1		tics in a Big Data World: The Essential Guide to Data Science and its/
		Y Big Data Series)", John Wiley & Sons,2014
2	-	rkde Roos, Krishnan Parasuraman, Thomas Deutsch, James Giles , David Corrigan,
	"Harness the Power	r of Big Data The IBM Big Data Platform", Tata McGraw Hill Publications, 2012

	Course Coo		urse Ti					cture	Set	mester:			
	BTCS833PE	ЕТ			Networ					L	Т	Р	VIII
Versi	on: 1.2				Approv	al: 16th	BoS 17			3	1	0	VIII
		cheme o								e of Exa		ion	0
		Periods		Hrs.						iximum		:	100
	Periods		: 4							nal Eval		:	30
		Credits	: 4							End Ser		:	70
Instruction Mode : Lecture Exam Di Prerequisite(s): Artificial Intelligence and Machine Learning									xam Du	ration	:	3 Hrs	
			Intellig	ence ar	nd Mach	nine Lea	arning						
	se Objectiv			1						14	1		
	o understa olve real wo			ep leari	ning alg	oriunins	s, the p	roblem	setting	s, and t	neir ap	plication	is to
	To learn the			ortificio	l nouro	lnetwo	rke one	thoir s	arious	tunos			
	o acquire t							i then v	arious	types.			
	o gain knov												
	se Outcome		o uppiy	optimiz	Jacion 5	<i>in avegie</i>							
	Os No.	(S	tateme	nt				М	apped P	rogran
												utcome	
	CO ₁	Identify	the de	ep leari	ning alg	orithm	s which	n are m	ore app	oropriat		PO ₁ , P	<u> </u>
		for vari	ous type	es of lea	arning t	asks in	various	s domai	ns.	-			
	CO ₂	Implem		-						oroblem	ns.	PO3	3
	CO ₃	Ability t	o use a	n efficie	ent algo	rithm fo	or Deej	o model	S			PO ₂ , P	O ₃
	CO ₄	Apply o										PO ₃ , P	
	Engineering												
	igations of c												
	nability, PO 8- Life-long Lea		'O ₉ - Indiv	vidual or	team wo	ork, PO 10	- Comn	nunicatio	on, PO 11-	Project	manage	ment and	finance
r O ₁₂	LITE IONG LEA												
			Mappi	ng of co	ourse of	itcome	s with 1	orogran	1 outco	mes			
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	Course utcomes	PO ₁	Mappin PO ₂	ng of co PO ₃	PO4	PO ₅	s with p PO ₆	orogran PO7	n outco PO ₈	mes PO ₉	PO ₁₀	PO ₁₁	PO ₁₂
											PO ₁₀	PO ₁₁	PO ₁₂
	utcomes	PO ₁	PO ₂								PO ₁₀	PO ₁₁	PO ₁₂
	utcomes CO ₁	PO ₁	PO ₂	PO ₃							PO ₁₀	PO ₁₁	PO ₁₂
	CO ₁ CO ₂	PO ₁	PO ₂	PO ₃							PO ₁₀	PO ₁₁	PO ₁₂
	atcomes CO1 CO2 CO3	PO ₁	PO ₂ 2 2	PO ₃		PO ₅	PO ₆	PO ₇	PO ₈	PO ₉	PO ₁₀	PO ₁₁	PO ₁₂
01	atcomes CO1 CO2 CO3	PO ₁ 2	PO ₂ 2 2 1 1	PO ₃ 2 2 2 1 - Reas	PO ₄	PO5 2 - Sig	PO ₆	PO ₇	PO ₈	PO ₉			
01	CO ₁ CO ₂ CO ₃ CO ₄	PO ₁ 2	PO ₂ 2 2 Introdu	PO ₃ 2 2 1 - Reas	PO ₄	PO5 2 – Sig	PO ₆ nifican	PO ₇ t; 3 – St	PO ₈	PO ₉	ctives an	PO ₁₁	
01	itcomes CO ₁ CO ₂ CO ₃ CO ₄ iled Conten	PO ₁ 2	PO ₂ 2 2 Introdu learnin	PO ₃ 2 2 1 - Reas uction: V	PO4 sonable; /arious p	PO ₅ 2 – Sig	PO ₆ nifican	PO ₇ t; 3 – St rning pr ental lear	PO ₈	PO ₉	ctives an	nd Issues	in deep
01	itcomes CO1 CO2 CO3 CO4 iled Conten Unit: 1	PO ₁ 2	PO ₂ 2 2 Introdu learnin Feedfo	PO ₃ 2 2 2 1 - Reas uction: V g frame rward n	PO4 sonable; /arious p work, re ieural ne	PO ₅ 2 – Sig	PO ₆ nifican	PO ₇ t; 3 – St rning pr ental lear	PO ₈	PO ₉	ctives an		in deep
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Unit: 1		Cloud Computing Fundamentals: Cloud Computing defini cloud, Cloud services: Benefits and challenges of cloud comput Cloud Computing, Applications cloud computing, Business Cloud – Major Players in Cloud Computing – Issues in Cloud Nimbus – Open Nebula, CloudSim							omputin siness n	ıg, Evolı nodels	ition of around	
Unit: 2	Nimbus - Open Nebula, CloudSim. Cloud Services and File System Types of Cloud services: Software as a Service - Platform as a Service - Infrastructure as a Service - Database as a Service- Monitoring as a Service - Communication as services. Service providers- Google App Engin Amazon EC2, Microsoft Azure, Sales force. Introduction to MapReduc GFS, HDFS, Hadoop Framework Collaborating With Cloud								Service Engine, Reduce,			
Unit: 3		on Coll Coll	aborating Event M aborating aborating rices – C is.	anagen g on W g via V	nent, C /ord Pr Veb-Bas	ontact °ocessi sed Co	Manag ng ,Dat mmunic	ement, abases ation T	Proje Storing 'ools –	ect Ma g and Evaluat	nagem Sharing ting We	ent – g Files- eb Mail

		Virtualization Basics of Virtualization - Types of Virtualization - Implementation Levels of
		Virtualization Virtualization Structures - Tools and Mechanisms -
		Virtualization of CPU, Memory, I/O Devices - Virtual Clusters and Resource
	Unit: 4	
	Unit: 4	management – Virtualization for Data-center Automation. Hardware and Infrastructure
		Clients, Security, Networks, Services. Accessing the Cloud – Platforms, Web
		Applications, Web APIs, Web Browsers. Cloud Storage - Overview, Cloud
		Storage Providers, Standards – Application, Client, Infrastructure, Service.
		Security in the Cloud
		Security Overview - Cloud Security Challenges and Risks - Software-as-a-
	Unit: 5	Service Security – Security Governance – Risk Management – Security
		Monitoring - Security Architecture Design - Data Security - Application
		Security – Virtual Machine Security – Identity Management and Access
		Control – Autonomic Security.
		tion Pattern: It include both internal evaluation (30 marks) comprising two class
	, 0	nents/ quiz/ seminar presentation etc. and external evaluation (70 marks) which
	ainly end semester e	xamination.
Tex	t Books:	
1	Toby Velte, Anthor	ny Velte, Robert Elsenpeter, "Cloud Computing, A Practical Approach", TMH,
	2009. Kumar Saura	bh, "Cloud Computing – insights into New -Era Infrastructure", Wiley
	India,2011.	
2	Cloud Computing "A	A Practical Approach" Anthony T. Velte, Toby J. Velte, Robert Elsenpeter.
	McGraw-Hill.	
Refe	erence Books:	
1	Kai Hwang, Geoffre	ey C Fox, Jack G Dongarra, "Distributed and Cloud Computing, From Parallel
	Processing to the In	ternet of Things", Morgan Kaufmann Publishers, 2012.
2	John W.Rittinghous	e and James F.Ransome, "Cloud Computing: Implementation, Management, and
	Security", CRC Pres	s, 2010.
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Course Cod	le			Co	urse Ti	tle			Le	cture	0	
BTCS835PE	ЕТ		Hun	nan Con	nputer	Interac	tion		L	Т	P Sei	mester:
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S	cheme of	f Instru	iction					Schem	e of Exa	minati	on	
No. of	Periods	:	60 Hrs.					Ma	aximum	Score	:	100
Periods	/ Week	:	4					Inter	nal Eval	uation	:	30
	Credits										:	70
Instruction	n Mode	:	Lecture)				Ε	xam Du	ration	:	3
	7			1 7	D							Hrs.
Prerequisite(s): (Course Objective		r Grapi	nics and	i image	Proces	sing						
1. To learn the		ions of	human	compu	ter inte	ractior).					
2. To understa								ls and r	persons	with di	sabilitie	s.
3. To provide t								I				
4. To impart th						ces.						
Course Outcome	es (CO):											
COs No.				S	tateme	nt					apped P	
CO ₁	Underst	and the	00000	nt offor	tivo dia	log for	UCI				utcome PO ₁ , P	<u> </u>
				-		0					PO1, P	02
CO ₂	Analyze disabilit		effective	e HCI	for in	dividu	als and	l pers	ons wi	th	PO ₂ , P	O 3
CO ₃	Assess t	he imp	ortance	ofuser	feedba	ick.					PO	3
CO ₄	Able to	-					ion desi	gn			PO ₃ , P	O 9
sustainability, PO 8- PO 12- Life-long Lea					itcomes				Ū			
Course	PO ₁	PO ₂	PO ₃	PO ₄	PO ₅	PO ₆	PO ₇	PO ₈	PO ₉	PO ₁₀	PO ₁₁	PO ₁₂
Outcomes	PO ₁	PO ₂	PO ₃	PO4	PO5	PU6	P U 7	PU ₈	PO9	PO10	PO11	PO12
CO ₁	2	2										
CO ₂		2	2									
CO ₃			2									_
CO ₄			2									
					a a'				1			
Detailed Contem	4	1	l – Reas	onable;	2 – Sigi	nifican	t; 3 – St	rong	1			
Detailed Conten	ts:					nifican	t; 3 – St	rong	1			
Detailed Conten	ts:	FOUN	DATIO	NS OF I	HCI	•		*		coblem	solving	The
Detailed Conten Unit: 1	ts:	FOUN The H	DATIO	NS OF H I/O cha	HCI annels -	Memo	ory – Re	asonin	g and pi		solving;	
	ts:	FOUN The H comp	DATIO	NS OF H I/O cha	HCI annels - Memor	· Memo ry – pro	ory – Re ocessin	asonin g and n	g and pi	s; Inter	action: I	Models
	ts:	FOUN The H comp – fran	DATIO Iuman: I uter: De neworks	NS OF H I/O cha evices – s – Ergo	HCI annels - Memor	• Memo ry – pro s – style	ory – Re ocessin	asonin g and n	g and pi	s; Inter		Models
	ts:	FOUN The H comp – fran DESI	IDATIO Iuman: I uter: De neworks GN & SO	NS OF H I/O cha evices – s – Ergc OFTWA	HCI annels – Memor onomics RE PRO	Memo ry – pro s – style CESS	ory – Re ocessin es – ele	asoning g and n ments	g and pi etwork: - intera	s; Inter ctivity-	action: I	Models gms.
Unit: 1	ts:	FOUN The H comp – fran DESI0 Intera Iterat	DATIO (uman:) uter: De neworks GN & So (ctive D ion and	NS OF H I/O cha evices – s – Ergo OFTWA esign ba prototy	HCI Annels – Memor Donomics RE PRO asics – J yping, H	Memo ry – pro – style CESS process ICI in s	ory – Re ocessin es – ele s – scer oftware	asonin g and n ments narios - e proce	g and pr etworks - intera · naviga ss – sof	s; Inter ctivity- tion – s tware li	action: I Paradig creen d ife cycle	Models gms. esign –
	ts:	FOUN The H comp – fran DESI Intera Iterat usabil	DATIO (uman: 1 uter: De neworks GN & SO (ctive D ion and ity engi	NS OF H I/O cha evices – s – Ergc OFTWA esign ba prototy neering	HCI Annels – Memonomics RE PRO asics – J yping. H g – Prot	Memo ry – pro s – style CESS process ICI in s otyping	ory – Re ocessin es – ele s – scer oftware g in pra	asoning g and n ments harios – e proce ctice –	g and pi etworka - intera • naviga ss – sof design	s; Inter <u>ctivity-</u> tion – s tware li rationa	action: I Paradig creen d ife cycle le. Desig	Models gms. esign – gn rules
Unit: 1	ts:	FOUN The H comp – fran DESI Intera Iterat usabil – prin	DATIO uman: 1 uter: De neworks GN & SO active D ion and ity engi ciples, s	NS OF H I/O cha evices – s – Ergc OFTWA esign ba prototy neering	HCI Annels – Memonomics RE PRO asics – J yping. H g – Prot	Memo ry – pro s – style CESS process ICI in s otyping	ory – Re ocessin es – ele s – scer oftware g in pra	asoning g and n ments harios – e proce ctice –	g and pi etworka - intera • naviga ss – sof design	s; Inter <u>ctivity-</u> tion – s tware li rationa	action: I Paradig creen d ife cycle	Models gms. esign – gn rules
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Unit: 1	ts:	FOUN The H comp – fran DESI Interat usabil – prin Desig MODI	DATIO (uman:) uter: De neworks GN & SO (ctive D ion and ity engi ciples, s n. ELS ANI	NS OF F I/O cha evices – S – Ergc DFTWA esign ba prototy neering standar	HCI annels – Memo onomics RE PRO asics – Jyping. H g – Prot ds, guic DRIES	Memo ry – pro s – style CESS process ICI in s otyping lelines,	ory – Re ocessin es – ele s – scer oftware g in pra rules. I	asonin g and n ments aarios – e proce ctice – Evaluat	g and pr etwork - intera - naviga - sof design ion Tec	s; Inter ctivity- tion – s tware li rationa hniques	action: 1 Paradig creen d ife cycle le. Desig s – Univ	Models gms. esign – gn rules ersal
Unit: 1	ts:	FOUN The H comp – fran DESI Interat Iterat usabil – prin Desig MODI Cogni	DATIO iuman: 1 uter: De neworks GN & SC active D ion and ity engi ity engi ciples, s n. ELS ANI tive mo	NS OF F I/O cha evices – S – Ergo DFTWA esign ba prototy neering standar D THEC dels –S	HCI annels – Memoro onomics RE PRO asics – pyping. H g – Prot ds, guid DRIES ocio-Or	Memo ry – pro s – style CESS process ICI in s otyping lelines,	ory – Re ocessin es – ele s – scer oftware g in pra rules. I rules. I	asonin g and n ments aarios – e proce ctice – Evaluat ssues a	g and pu etworka - intera ss – sof design ion Tec: nd stak	s; Inter ctivity- tion – s tware li rationa hniques e holde	action: 1 Paradig creen d ife cycle le. Desig s – Univ r requir	Vodels gms. esign – gn rules ersal ements
Unit: 1 Unit: 2	ts:	FOUN The H comp – fran DESI4 Interat Iterat usabil – prin Desig MODI Cogni –Com	DATIO iuman: l uter: De neworks GN & SC active D ion and ity engi ciples, s n. ELS ANI tive mo munica	NS OF F I/O cha evices – S – Ergo DFTWA esign ba prototy neering standar D THEC dels –S	HCI annels – Memoro onomics RE PRO asics – pyping. H g – Prot ds, guid DRIES ocio-Or	Memo ry – pro s – style CESS process ICI in s otyping lelines,	ory – Re ocessin es – ele s – scer oftware g in pra rules. I rules. I	asonin g and n ments aarios – e proce ctice – Evaluat ssues a	g and pu etworka - intera ss – sof design ion Tec: nd stak	s; Inter ctivity- tion – s tware li rationa hniques e holde	action: 1 Paradig creen d ife cycle le. Desig s – Univ	Models gms. esign – gn rules ersal ements
Unit: 1 Unit: 2	ts:	FOUN The H comp – fran DESI4 Interat Iterat usabil – prin Desig MODI Cogni –Com WWW	DATIO iuman: l uter: De neworks GN & SC ictive D ion and ity engi ciples, s n. ELS ANI tive mo munica 7.	NS OF F I/O cha evices – S – Ergo DFTWA esign ba prototy neering standar D THEC dels –S	HCI annels – Memoro onomics RE PRO asics – pyping. H g – Prot ds, guid DRIES ocio-Or	Memo ry – pro s – style CESS process ICI in s otyping lelines,	ory – Re ocessin es – ele s – scer oftware g in pra rules. I rules. I	asonin g and n ments aarios – e proce ctice – Evaluat ssues a	g and pu etworka - intera ss – sof design ion Tec: nd stak	s; Inter ctivity- tion – s tware li rationa hniques e holde	action: 1 Paradig creen d ife cycle le. Desig s – Univ r requir	Models gms. esign – gn rules ersal ements
Unit: 1 Unit: 2 Unit: 3	ts:	FOUN The H comp – fran DESI Intera Iterat usabil – prin Desig MODI Cogni –Com WWW MOBI	DATIO: (uman:) uter: Deneworks GN & SC (ctive D ion and ity engi ciples, s n. ELS ANI tive mo munica 7. LE HCI	NS OF H I/O cha evices – s – Ergc DFTWA esign ba prototy neering standar D THEC dels –S tion an	HCI annels – Memoro momics RE PRO asics – p yping. H g – Prot ds, guid DRIES ocio-Or d collab	Memo cy – pro s – style CESS process ICI in s otypiną lelines, rganiz <i>a</i> oration	ory – Re ocessin es – ele s – scer oftware g in pra rules. I rules. I n mode	asonin g and n ments aarios – e proce ctice – Evaluat ssues a ls–Hype	g and pr etwork: - intera - naviga ss – sof design ion Teci nd stak ertext, N	s; Inters ctivity- tion – s tware l rationa hniques e holde Multime	action: 1 Paradig creen d ife cycle le. Desig s – Univ r requir edia and	Models gms. esign – gn rules ersal ements
Unit: 1 Unit: 2	ts:	FOUN The H comp – fran DESI Iterat usabil – prin Desig MODI Cogni –Com WWW MOBI MOBI	DATIO: fuman: 1 uter: De neworks GN & SC active D ion and ity engi ciples, s n. ELS ANI tive mo munica 7. LE HCI e Ecosy	NS OF H I/O cha evices – s – Ergc DFTWA esign ba prototy neering standar D THEC dels –S tion an stem: P	HCI annels – Memoro momics RE PRO asics – J yping. H g – Prot ds, guid DRIES ocio-Or d collab	Memo cy – pro s – style CESS process ICI in s otypiną lelines, rganiza ooration	ory – Re ocessin es – ele s – scer oftware g in pra rules. I ational i n mode	asonin g and n ments e proce ctice – Evaluat ssues a ls–Hype framev	g and privetworks - intera - naviga ss – sof design ion Teci nd stak ertext, N	s; Inters ctivity- tion – s tware l rationa hniques e holde Multime Fypes o	action: I Paradig creen d ife cycle le. Desig s – Univ r requir edia and	Models gms. esign – gn rules ersal ements
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Unit: 1 Unit: 2 Unit: 3	ts:	FOUN The H comp – fran DESI Interat usabil – prin Desig MODI Cogni –Com WWW MOBI MOBI Mobil Applic Mobil	IDATIO: fuman: 1 uter: De neworks GN & SO active D ion and ity engi ciples, s n. ELS ANI tive mo munica 7. LE HCI e Ecosy cations:	NS OF H I/O cha evices – S – Ergo DFTWA esign ba prototy neering standar D THEC dels –S tion an stem: P Widget lobile D	HCI annels – Memoro momics RE PRO asics – J yping. H g – Prot ds, guic DRIES ocio-Or d collab d collab	Memo ry – pro- s – style CESS process ICI in s otyping lelines, rganiza ooration s, Appl cations	ory – Re ocessin es – ele s – scer oftware g in pra rules. I ntional i n mode ication s, Game	asonin g and n ments e proce ctice – Evaluat ssues a ls-Hype framev s- Mot	g and privetworks - intera - naviga ss – sof design ion Teci nd stak ertext, N	s; Inters ctivity- tion – s tware l rationa hniques e holde Multime Types o rmation	action: I Paradig creen d ife cycle le. Desig s – Univ r requir edia and	Models gms. esign – gn rules ersal ements
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Exa	mination and Evaluation Pattern: It include both internal evaluation (30 marks) comprising two class						
sess	sessional exams/ assignments/ quiz/ seminar presentation etc. and external evaluation (70 marks) which						
is m	ainly end semester examination.						
Text	t Books:						
1	Alan Dix, Janet Finlay, Gregory Abowd, Russell Beale, "Human Computer Interaction", 3rd Edition,						
	Pearson Education, 2004						
Refe	erence Books:						
1	Bill Scott and Theresa Neil, "Designing Web Interfaces", First Edition, O"Reilly, 2009.						

2 Brian Fling, "Mobile Design and Development", First Edition, O"Reilly Media Inc., 2009

Cours	Course CodeCourse TitleBTCS836PETWeb and Internet Technology									Leo	ture	Semeste		
		[L	T P		III	
Version: 1.2					Approv	7 al: 16th	BoS 17			3	1 0		111	
		heme o						5			minatio	1		
	No. of P			Hrs.							n Score		100	
Pe	eriods/		: 4						Inte		luation		30	
Ingta	ruction	redits	: 4	cture							emester	-	70 3 Hrs.	
Prerequisi										Exam D	uration	•	S HIS.	
Course Ob			I Netw	01 K5										
	5		concept	tual and	l techno	ological	develor	ments	in the f	ield of I	nternet	and we	b	
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	-		-		0		n PHP so		-		9.			
Course Ou	<u> </u>		neuget	JI DUBIC	commu	ind with	11111 50	- ipting	langua	50.				
COs No		()			S	tateme	nt				Mar	ped Pr	ogram	
												tcomes		
CO ₁	1	Demons	strate t	he abilit	y to cre	eate we	b pages	using H	ITML, I	DHTML	,	PO ₁ , PO	2	
			<u> </u>	d XML.										
CO_2	1	Review	the cur	rent top	pics in V	Veb & I	nternet	techno	logies			PO_2		
CO ₃	1	Apply se	erver-s	ide scrij	pting wi	ith PHP	langua	ge			I	PO 3, PO 5, 1	PO ₉	
<u> </u>				-				0	+		Т	PO 3, PO 4, 1	DO-	
CO ₄ PO ₁ - Engine		-				0	g with Ja	-						
PO12- Life-lo	-			viuuai oi	teamwo	ЛК, РО 10	Comm	unication	1, PO 11 ⁻¹	Project n	lanagein			
		ning					s with p			-	Ianagem		-	
Course	se	ning PO ₁								-	PO ₁₀	PO ₁₁	PO ₁	
Cours Outcom	se nes	ning PO ₁	Mappi PO ₂	ng of co	ourse ou	itcomes	s with p	rogram	outcor	nes	-		•	
Cours Outcom CO ₁	se nes	ning	Mappi PO ₂ 2	ng of co	ourse ou	itcomes	s with p	rogram	outcor	nes	-		PO ₁	
Course Outcom CO ₁ CO ₂	se nes	ning PO ₁	Mappi PO ₂	ng of co PO ₃	ourse ou	PO5	s with p	rogram	outcor	PO ₉	-		PO ₁	
Course Outcom CO ₁ CO ₂ CO ₃	se nes	ning PO ₁	Mappi PO ₂ 2	ng of co	ourse ou	itcomes	s with p	rogram	outcor	nes	-		PO ₁	
Course Outcom CO ₁ CO ₂	se nes	ning PO ₁	Mappi PO2 2 2	ng of cc PO ₃ 2 2	PO ₄	PO5 2 2	s with p PO6	rogram PO7	outcor PO ₈	PO ₉	-		PO ₁	
Course Outcom CO ₁ CO ₂ CO ₃	se nes	PO ₁	Mappi PO2 2 2	ng of cc PO ₃ 2 2	PO ₄	PO5 2 2	s with p	rogram PO7	outcor PO ₈	PO ₉	-		PO ₁	
Course Outcom CO ₁ CO ₂ CO ₃ CO ₄	se nes	PO ₁	Mappi PO2 2 2	ng of co PO ₃ 2 2 1 - Reas	PO4 PO4 2 conable;	PO5 PO5 2 2 2 - Sign	s with p PO6	rogram PO ₇ ; 3 – Str	outcor PO ₈	PO ₉	-	PO ₁₁	PO1 2	
Course Outcom CO ₁ CO ₂ CO ₃ CO ₄	se nes	PO ₁	Mappi PO2 2 2 Introd	ng of co PO ₃ 2 2 1 - Reas	PO4 PO4 2 conable;	PO5 PO5 2 2 2 - Sign	s with p PO6	rogram PO ₇ ; 3 – Str	outcor PO ₈	PO ₉	PO ₁₀	PO ₁₁	PO1 2	
Course Outcom CO ₁ CO ₂ CO ₃ CO ₄ Detailed Co	se nes	PO ₁	Mappi PO2 2 2 Intro and A Interr	ng of cc PO ₃ 2 2 1 - Reas duction RPANE' net Appl	PO4 PO4 2 conable; to Inte F, lications	PO5 2 2 2 2 - Sign	s with p PO ₆ nificant nternet,	rogram PO7 ; 3 – Str Interne	outcor PO ₈ rong et histor	PO ₉ 1 1 ry of the	PO ₁₀	PO ₁₁	PO1 2 /eb	
Course Outcom CO ₁ CO ₂ CO ₃ CO ₄ Detailed Co	se nes	PO ₁	Mappi PO2 2 2 Introd and A Interr Interr	ng of cc PO ₃ 2 2 1 - Reas duction RPANE ^T net Appl net, Imp	PO ₄ PO ₄ 2 conable; το Inte Γ, lications act of In	PO5 PO5 2 2 - Sign prnet: Ir s - Com	s with p PO ₆ nificant nternet, nmerce	rogram PO7 ; 3 – Sta Interne on the I iety – C	outcor PO ₈ rong et histor	nes PO ₉ 1 ry of the t, Goven	PO ₁₀	PO ₁₁	PO1 2 /eb	
Course Outcom CO ₁ CO ₂ CO ₃ CO ₄ Detailed Co	se nes	PO ₁	Mappi PO2 2 2 Introd and A Interr Interr	ng of cc PO ₃ 2 2 1 - Reas duction RPANE ^r net Appl net, Imp net Net	PO4 PO4 2 conable; to Inte F, lications act of It twork:	PO5 PO5 2 2 - Sign rrnet: Ir s - Com nternet Networ	s with p PO6 nificant nternet, merce on Soc k defin	rogram PO7 ; 3 – Sti Interne on the I iety – C ition, C	outcor PO ₈ Fong et histor interne rime or	nes PO ₉ 1 t, Goven h/throu	PO ₁₀	PO ₁₁ Wide W on the internet s: LAN,	PO1 2 Veb	
Course Outcom CO ₁ CO ₂ CO ₃ CO ₄ Detailed Co	se nes	PO ₁	Mappi PO2 2 2 Introd and A Interr Interr Node,	ng of cc PO ₃ 2 2 1 - Reas duction RPANE ^T net Appl net, Imp net, Imp net Net Host, V	PO ₄ PO ₄ 2 conable; to Inte Γ, lications bact of In twork: Worksta	PO5 PO5 2 2 - Sign rrnet: Ir s - Com nternet Networ	s with p PO6 nificant nternet, merce on Soc k defin	rogram PO7 ; 3 – Sti Interne on the I iety – C ition, C	outcor PO ₈ Fong et histor interne rime or	nes PO ₉ 1 t, Goven h/throu	PO ₁₀	PO ₁₁ Wide W on the internet s: LAN,	PO1 2 Veb	
Course Outcom CO ₁ CO ₂ CO ₃ CO ₄ Detailed Co	se nes	PO ₁	Mappi PO2 2 2 Introd and A Interr Interr Node, netwo	ng of cc PO ₃ 2 2 1 – Reas duction RPANE ⁷ net Appl net, Imp net Net , Host, V ork secu	PO ₄ PO ₄ 2 conable; to Inte Γ, lications act of In twork: Workstaurity.	PO5 2 2 2 - Sign rnet: Ir s - Com nternet Networ ttion, ba	nificant nificant nternet, on Soc k defin andwidt	rogram PO7 ; 3 – Sta Interne on the I iety – C ition, C ch, Inter	outcor PO ₈ rong et histor interne rime or common coperation	PO9 1 1 t, Goven h/throu h termi ility, No	PO ₁₀	PO ₁₁ Wide W on the internet s: LAN, adminis	PO1 2 Veb	
Course Outcom CO ₁ CO ₂ CO ₃ CO ₄ Detailed Co	se nes	PO ₁	Mappi PO2 2 2 Introd and A Interr Interr Node, netwo Netwo	ng of cc PO ₃ 2 2 duction RPANE net Appl net, Imp net Net Host, V ork secu ork Cor	PO4 PO4 2 conable; to Inte Γ, lications act of In twork: Worksta urity. nponen	PO5 PO5 2 2 2 - Sign rnet: Ir s - Com nternet Networ ation, ba	s with p PO6 nificant nternet, merce on Soc k defin andwidt	rogram PO7 ; 3 – Stu Interne on the I iety – C ition, C ch, Inter er, Com	outcor PO ₈ rong et histor interne rime or common coperation	PO9 1 1 t, Goven h/throu h termi ility, No	PO ₁₀	PO ₁₁ Wide W on the internet s: LAN, adminis	PO1 2 Veb	
Course Outcom CO ₁ CO ₂ CO ₃ CO ₄ Detailed Co	se nes	PO ₁	Mappi PO2 2 2 Introd and A Interr Interr Interr Node, netwo	ng of cc PO ₃ 2 2 1 - Reas duction RPANE' net Appl net, Imp net Net , Host, V ork secu ork Con ork: Pee	PO4 PO4 2 conable; to Inte F, lications act of In twork: Worksta irity. nponen r-Peer,	PO5 PO5 2 2 - Sign rnet: Ir s - Com nternet Networ ation, ba ts:Clier Clients	s with p PO6 nificant nternet, nmerce on Soc k defin andwidt nt, Serve	rogram PO7 ; 3 – Str Interne on the I iety – C ition, C ch, Inter	outcor PO ₈ rong et histor interne common coperab	nes PO ₉ 1 ry of the t, Goven h/through termi ility, Ne tion Me	PO ₁₀ PO ₁₀ e World cnance o igh the I nologies etwork a	PO ₁₁ Wide W on the internet s: LAN, adminis	PO1 2 Veb	
Course Outcom CO ₁ CO ₂ CO ₃ CO ₄ Detailed Co	se nes	PO ₁	Mappi PO2 2 2 Introd and A Interr Interr Interr Node, netwo Netwo Addre	ng of cc PO ₃ 2 2 1 - Reas duction RPANE ⁷ net Appl net, Imp net Appl net, Imp net Net Host, V ork secu ork Cor ork: Pee essing in	PO4 PO4 2 conable; to Inte F, lications act of In twork: Worksta urity. nponen r-Peer, n Intern	PO5 PO5 2 2 2 - Sign rnet: Ir s - Com nternet Networ ation, ba ts:Clien Clients net: DN	s with p PO6 nificant nternet, amerce on Soc k defin andwidt t, Serve S, Doma	rogram PO7 ; 3 – Sta Interne iety – C ition, C th, Inter er, Com	outcor PO ₈ rong et histor interne rime or coperab munica	nes PO ₉ 1 ry of the t, Goven h/through tion Me tion Me	PO ₁₀ PO ₁₀ e World rnance o nologies etwork a edia, Typ ganizatio	PO ₁₁ Wide W on the internet s: LAN, adminis bes of on,	PO1 2 Veb	
Course Outcom CO1 CO2 CO3 CO4 Detailed Co	se nes	PO ₁	Mappi PO2 2 2 Introd and A Interr Interr Interr Node, netwo Netwo Addre under	ng of cc PO ₃ 2 2 2 1 – Reas duction RPANE ⁷ net Appl net, Imp net Appl net, Imp net Net Nets, Vork secu ork Cor ork Cor ork: Pee essing in	PO ₄ PO ₄ 2 conable; conable; conable; dot of Internation work: workstaurity. nponen r-Peer, n Internation	PO5 PO5 2 2 2 - Sign rnet: Ir s - Com nternet Networ tion, ba ts:Clien Clients net: DN nternet	s with p PO6 nificant nternet, on Soc k defin andwidt nt, Server S, Doma Protoco	rogram PO7 ; 3 – Sta Interne ition, C ition, C ch, Inter er, Com	outcor PO ₈ rong et histor interne rime or common coperation munica munica ne and t	nes PO ₉ 1 ry of the t, Goven h/through tion Me tion Me	PO ₁₀ PO ₁₀ e World cnance o igh the I nologies etwork a	PO ₁₁ Wide W on the internet s: LAN, adminis bes of on,	PO1 2 Veb	
Course Outcom CO1 CO2 CO3 CO4 Detailed Co	se nes	PO ₁	Mappi PO2 2 2 Introd and A Interr Interr Interr Node, netwo Netwo Netwo Addre under and ri	ng of cc PO ₃ 2 2 1 – Reas duction RPANE net Appl net, Imp net Appl net, Imp net Net , Host, V ork secu ork Cor ork Cor ork: Pee essing in rstandin ng, Etho	PO4 PO4 2 conable; to Inte Γ, lications act of In work: Worksta rity. nponen r-Peer, n Intern og the Ir ernet, F	PO5 PO5 2 2 2 - Sign rrnet: Ir s - Com nternet: Ir Networ ation, ba ts:Clients net: DN nternet DDI, AT	s with p PO6 nificant nternet, merce on Soc k defin andwidt nt, Serve -Server S, Doma Protoco	rogram PO7 ; 3 – Sta Interne on the I iety – C ition, C ch, Inter er, Com ain Nam ol Addre Intrane	outcor PO ₈ rong et histor interne rime or common roperab munica ne and t	PO9 1 1 t, Goven h/throu h termi ility, No tion Me heir org work to	PO ₁₀ PO ₁₀ e World cnance o igh the l nologies etwork a edia, Typ ganizatio pologie	PO ₁₁ Wide W on the internet s: LAN, adminis bes of on, s: Bus, s	PO1 2 Veb Value Valu	
Course Outcom CO1 CO2 CO3 CO4 Detailed Co	se nes	PO ₁	Mappi PO2 2 2 Introd and A Interr Interr Interr Node, netwo Netwo Netwo Netwo Netwo Servio	PO3 PO3 2 2 2 1 – Reas duction RPANET het Appl het, Imp het Appl het, Imp het Net vrk secu ork con ork con ork: Pee essing in restandin ng, Etho ces & Cu	PO4 PO4 2 conable; to Inte Γ, lications act of In twork: Worksta urity. nponen r-Peer, n Intern ng the Ir ernet, F urrent T	PO5 PO5 2 2 2 - Sign rnet: Ir s - Com nternet: Ir Networ ation, ba ts:Clients net: DN nternet DDI, AT Frends	s with p PO6 nificant nternet, merce on Soc k defin andwidt nt, Serve -Server S, Doma Protoco CM and on Inter	rogram PO7 ; 3 – Str ; 3 – Str ; 1 – C ition, C ch, Inter er, Com er, Com ain Nam ol Addre Intrane rnet: Se	outcor PO ₈ rong et histor interne rime or coperab munica ne and t ess. Net t. rvices-	PO9 1 ry of the t, Goven h through tion Me tion Me their orgonal work to E-mail,	PO ₁₀ PO ₁₀ e World cnance o nologies etwork a edia, Typ ganizatio pologie WWW,	PO ₁₁ Wide W on the Internet S: LAN, adminis Des of on, s: Bus, s Telnet,	PO1 2 Veb WAN trator tar HTTP	
Course Outcom CO1 CO2 CO3 CO4 Detailed Co	se nes	PO ₁	Mappi PO2 2 2 Introd and A Interr Interr Node, netwo Netwo Netwo Netwo Netwo Servio FTP,	PO3 PO3 2 2 1 - Reas duction RPANE' net Appl net, Imp net Net Host, W ork secu ork Cor ork: Pee essing in standin ng, Etho ces & Cu IRC and	PO4 PO4 2 conable; co	PO5 PO5 2 2 2 - Sign rrnet: Ir s - Com nternet: Ir Networ ation, ba ts:Clier Clients net: DN nternet DDI, AT Trends (s with p PO6 nificant nternet, nmerce on Soc k defin andwidt nt, Serve -Server S, Doma Protoco I'M and on Inter ne, Cur	rogram PO7 ; 3 – Str ; 3 – Str ; 3 – Str ; 1 – C ition, C	outcor PO ₈ rong et histor interne rime or common coperab munica ne and t sss. Net t. rvices- rends-	PO9 1 ry of the t, Goven htrough tion Me tion Me tion Me termil, Langua	PO ₁₀ PO ₁₀ e World cnance o igh the l nologies etwork a edia, Typ ganizatio pologie	PO ₁₁ Wide W on the Internet S: LAN, adminis Des of on, s: Bus, s Telnet,	PO1 2 Veb WAN trator tar HTTP	
Course Outcom CO1 CO2 CO3 CO4 Detailed Co	se nes	PO ₁	Mappi PO2 2 2 Introd and A Interr Interr Interr Node, netwo Addre under and ri Servio FTP, Interr	PO3 PO3 2 2 1 - Reas duction RPANE' net Appl net, Imp net Net Host, W ork secu ork Cor ork: Pee essing in standin ng, Etho ces & Cu IRC and net Vide	PO4 PO4 2 conable; co	PO5 PO5 2 2 2 - Sign rnet: Ir s - Com nternet: Ir Networ ation, ba ts:Clier Clients net: DN nternet DDI, AT Trends o th Engin	s with p PO6 nificant nternet, nternet, nternet, s on Soc k defin andwidt nt, Serve Server S, Doma Protocc IM and on Inter ne, Cur e compu	rogram PO7 ; 3 – Str ; 3 – Str ; 3 – Str interne iety – C ition, C ition, C ition, C ch, Inter er, Com er, Com ain Nam ol Addre Intrane rnet: Se rrent Tr iting, e-	outcor PO ₈ rong et histor interne rime or common common roperab munica ne and t ess. Net t. rvices- rends- -comm	PO9 1 ry of the t, Goven h/throu tion Me tion Me tion Me cheir org work to E-mail, Langua erce.	PO ₁₀ PO ₁₀ e World cnance o agh the l nologies etwork a edia, Typ ganizatio pologie WWW, ges, Int	PO ₁₁ Wide W on the Internet S: LAN, adminis Des of on, s: Bus, s Telnet, cernet I	PO1 2	
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Course Outcom CO1 CO2 CO3 CO4 Detailed Cd Ur	se nes	PO ₁	Mappi PO2 2 2 Introd and A Interr Interr Interr Node, netwo Addre under and ri Servio FTP, Interr Web I Interc mana	ng of cc PO3 2 2 2 1 – Reas duction RPANE net Appl net, Imp net Appl net, Imp net Net Nork secu ork cor ork cor ork cor ork: Pee essing in rstandin ng, Etho ces & Cu IRC and net Vide Publishi change S gement	PO4 PO4 2 conable; conable; conable; conable; dorksta rity. mponen r-Peer, n Intern ag the Ir ernet, F urrent T d Searc co, collal ing and Standar , Web P	PO5 PO5 2 2 2 - Sign rrnet: Ir s - Com nternet: Ir Networ ation, ba ts:Clients net: DN nternet DDI, AT Frends of th Engli borative Browsi ds, Com age Des	s with p PO6 nificant nificant nternet, on Soc k defin andwidt nt, Serve -Server S, Doma Protocc CM and on Inter ne, Cur e compu ing: Ove	rogram PO7 3 - Str 3 -	outcor PO ₈ PO ₈ ong thistor interne rime or common coperab munica e and t ess. Net t. rvices- rends- comm Web ho cb Publicion and	PO9 PO9 1 ry of the t, Goven h/throu h termi ility, Ne tion Me tion Me termil, Langua erce. ssting, F shing, I l Princi	PO ₁₀ PO ₁₀ e World mance o igh the l nologies etwork a edia, Typ ganizatio pologie WWW, iges, Int ITML. D Docume	PO ₁₁ Wide W on the internet s: LAN, adminis bes of on, s: Bus, s Telnet, ternet I occument	PO1 2 Veb Veb tar HTTP Phone	

		Contraction of the contraction o
		Style Sheets: Need for CSS, introduction to CSS, basic syntax and structure,
		using CSS, background images, colors and properties, manipulating texts, using
		fonts, borders and boxes, margins, padding lists, positioning using CSS.
		Interactivity Tools: ASP, VB Script, JAVA Script, JAVA and Front Page, Flash
	Unit: 4	Javascript: Client side scripting, What is Javascript, How to develop Javascript,
		Simple Javascript, Variables, Functions, Control Statements, Arrays.
		PHP: Starting to script on server side, Arrays, function and forms, advance PHP
		Databases : Basic command with PHP examples, Connection to server, creating
	Unit: 5	database, selecting a database, listing database, listing table names creating a
		table, inserting data, altering tables, queries, deleting database, deleting data
		and tables, PHP myadmin and database bugs.
Exar	nination and Evalua	tion Pattern: It include both internal evaluation (30 marks) comprising two class
sess	ional exams/ assignr	nents/ quiz/ seminar presentation etc. and external evaluation (70 marks) which
is m	ainly end semester e	xamination.
Text	Books:	
1	Jeffrey C.Jackson,	"Web TechnologiesA Computer Science Perspective", 2006, Pearson
	Education.	
2	Robert. W. Sebest	a, "Programming the World Wide Web", Fourth Edition, 2007, Pearson
	Education.	
Refe	rence Books:	
1	Deitel, Deitel, Gol	dberg, "Internet & World Wide Web How To Program", Third Edition,
	2006, Pearson Edu	ucation.
2	Marty Hall and La	rry Brown,"Core Web Programming" Second Edition, Volume I and II,
	2001, Pearson Edu	ication.

									Lee	cture	C -		
BTCS837F	PET		Crypto	ography	and Ne	etwork	Security		L	ΤP)	nester:	
Version: 1.2			Date of	f Appro	val: 16tł	n BoS 17	-11-2022	2	3	1 0	, j	VIII	
	Scheme o	f Instru							of Exa	ninatio	n		
No. o	f Periods	riods : 60 Hrs. Ma									:	100	
Period	s/Week										aluation : 30		
	Credits	: 4]	End Se	mester	:	70	
Instructi										uration	:	3 Hrs	
Prerequisite(s)											1 1		
Course Objecti	<u>.</u>												
1. To learn th		entals o	of comp	uter Ne	tworks	securit	v concer	ots and s	securit	v challe	nges.		
2. To underst												ncepts	
Fiestal cipł					1 0	1	1	,		,	5	1	
3. To provide			ymmet	ric and	asymm	etric ke	y crypto	graphy,	factor	rs affect	ing co	mpute	
Networks s	security de	eploym	ent.		-							-	
4. To acquire	the know	ledge o	of emerg	ging tec	hnolog	y in the	net-cen	tric sec	urity a	areas an	d asses	ss thei	
current caj									·				
Course Outcon	nes (CO):												
COs No.				St	atemen	ıt				Марг	oed Pro	ogram	
											comes		
CO ₁	Unders	tand	the di	fference	e betv	veen s	steganog	raphy	and		PO ₁ , PO	2	
	cryptog	raphic	techni	iques,	various	public	and j	private	key				
	algorith	ms.		-		-		-	-				
CO ₂	Demon	strate	Netwo	rk sec	urity i	ssues	like co	nfidenti	iality,		PO ₂ , PO	3	
					-		horizatio		-				
CO ₃	-		-				ocol, Vi				PO ₆		
							em, Fire						
	virtual 1					5	,	,					
CO ₄	Gain th	e knov	ledge d	of emer	ging te	chnolog	gy in the	e net-ce	entric		PO ₁₀		
							pabilities						
	and pot						1						
PO1- Engineerin													
investigations of													
sustainability, PO		O 9- Indi	vidual or	team wo	ork, PO 10	- Comm	unication	, PO 11- PI	oject n	anagem	ent and	finance	
PO ₁₂ - Life-long L	earning					• . 1							
		маррі	ng of co	ourse ou	itcomes	s with p	rogram	outcom		r	Т		
Course	PO ₁	PO_2	PO ₃	PO ₄	PO ₅	PO_6	PO ₇	PO ₈	РО	PO ₁₀	PO ₁₁	РО	
Outcomes									9			2	
<u>CO1</u>	2	2										_	
CO ₂		2	2			-							
CO ₃				ļ		2							
CO ₄						L				2			
			1 – Reas	onable:	2 - Sian	nificant	; 3 – Str	ona					
Detailed Conte					- ~··j		, 0 501	g					

	Introduction to the Concepts of Security: The need for security, Security
	Approaches, Principles of Security, Types of Attacks. Cryptographic
Unit: 1	Techniques: Plain Text and Cipher Text, Substitution Techniques,
Onit: I	Transposition Techniques, Encryption and Decryption, Symmetric and
	Asymmetric Key Cryptography, Steganography, Key Range and Key Size,
	Possible Types of Attacks.
	Modular arithmetic, prime numbers, relative prime numbers, Euler's function,
	GCD. Computer-based Symmetric Key Cryptographic Algorithms: Algorithm
Unit: 2	Types and Modes, An overview of Symmetric Key Cryptography, DES,
	International Data Encryption Algorithm (IDEA), RC5, Blowfish, AES, Differential
	and Linear Cryptanalysis.
	Computer-based Asymmetric Key Cryptography: Brief History of Asymmetric
Unit: 3	Key Cryptography, An overview of Asymmetric Key Cryptography, The RSA
	Algorithm, Symmetric and Asymmetric Key Cryptography, Digital Signatures.

		Public Key Infrastructure: Digital Certificates, Private Key Management, The								
		PKI Model, Public Key Cryptography Standards, PKI and Security. Internet								
Unit: 4		Security Protocols: Basic Concepts, Secure Socket Layer, SHTTP, Time								
		Stamping Protocol, Secure Electronic Transaction, SSL versus SET, 3-D Secure								
		Protocol, Electronic Money, E-mail Security.								
		Understanding Session Hijacking, Spoofing vs Hijacking, Steps in Session								
		Hijacking, Types of Session Hijacking, and TCP Concepts Sequence numbers.								
	Unit: 5	ARP Spoofing and Redirection, DNS and IP Sniffing, HTTPS Sniffing. Wireless								
		802.11 Networks security standards, Sniffing Traffic, Wireless DOS attacks,								
		DDoS, WLAN Scanners, WLAN Sniffers, Securing Wireless Networks.								
Exa	mination and Evalua	tion Pattern: It include both internal evaluation (30 marks) comprising two class								
sessional exams/ assignn		nents/ quiz/ seminar presentation etc. and external evaluation (70 marks) which								
is m	ainly end semester e	xamination.								
Tex	t Books:									
1	Cryptography and N	Networks Security by Behrouz A. Forouzan, 2 nd Edition TMH.								
2	Cryptography and N	Networks Security, W. Stallings, Prentice Hall, 5 th Edition, 20102.								
Refe	erence Books:									
1	Networks Security	Essentials, William Stallings, Prentice Hall, 5 th Edition, 2013.								
2	Firewalls and Inter	rnet Security, William R. Cheswick and Steven M. Bellovin, Addison-Wesley								
	Professional, 2ndEdition, 2003.									
	•									

Course C								ture	Sem	Semester:			
BTCS838				t Comp	0			L	Т Р		III		
Version: 1.2				f Appro	val: 16tł	n BoS 17-			3	1 0		111	
	Scheme o	f Instru	ction				Se	cheme o	of Exan	ninatior	1		
No. c	of Periods	: 60) Hrs.					Ма	ximum	Score	:	100	
Perio	ds/Week	: 4						Interr	nal Eval	uation	:	30	
	Credits	: 4						I	End Sei	mester	:	70	
Instruct	tion Mode	: Le	ecture					E	xam Du	iration	:	3 Hrs.	
Prerequisite(s)): Data Min	ing & D	ata War	re Hous	ing and	Machin	e Learn	ing			I		
Course Objecti		0			0			0					
 To familiar To provide intelligent of it using To unders experience To import 	e the basi systems, s in real syst stand the i e.	c conce uch as, cems. dea of	epts of fuzzy n Neural	differe nodels, Networ	nt met neural rks s, ft	hods an Network 1zzy logi	d tools is s, pro c and u	for pr babilist 1se of l	ic moc neurist	lels, and ics base	l found	ations	
4. To impart		eage of	Diologic	cal neur	ons and	a their si	mulatio	n to pro	blem s	solving.			
Course Outcon	nes (CO):			~	- 4 -	- 4				1.15			
COs No.				St	atemer	10					ped Pro	•	
	T 1	1 1.									comes (PO ₁ , PO	· /	
CO1	building	g intellig	gent ma	ribe soft computing techniques and their roles in nt machines.								2	
CO_2	0	ize the feasibility of applying a soft computing methodology rticular problem.									PO ₂		
	-		1										
CO_3		strate fuzzy logic and reasoning to handle uncertainty and									PO ₃ , PO ₄ , PO ₉		
	colvo o	gineering problems, genetic algorithms to combinatorial											
					genetic	angoriten							
	optimiz	ation p	roblems	5.	0	U							
CO ₄	optimiz Apply A	ation pi rtificial	roblems Neural	5.	0	olve varie					PO _{3,} PO	4	
PO 1- Engineerin	optimiz Apply A regress ng Knowled	ation pr rtificial ion prol ge, PO 2	roblems Neural blems. - Proble	s. Networ em anal	rks to so lysis, PC	olve vario D ₃ - Desig	ous clas	sificatio	on and of sol	utions,	PO 4- C	onduct	
CO ₄ PO ₁ - Engineerin investigations of sustainability, PO PO ₁₂ - Life-long L	optimiz Apply A regress Mg Knowled Complex pr Ds- Ethics, P	ation pr rtificial ion prol ge, PO ₂ oblems, O ₉ - Indiv	roblems Neural blems. - Proble PO5- Mo idual or	5. Networ em anal odern to team wo	rks to so lysis, PC ol usage ork, PO 10-	olve vario D ₃ - Desig e, PO 6- Th	ous clas n/devel e engine nication,	sificatio opment eer and s PO 11- Pr	on and of sol society, oject m	utions, 1 PO 7- En	PO₄ − C vironme	onduct ent and	
PO ₁ - Engineerin investigations of sustainability, PC	optimiz Apply A regress ng Knowled complex pr Ds- Ethics, Pr Learning	ation pro rtificial ion prol ge, PO ₂ oblems, O ₉ - Indiv Mappir	roblems Neural blems. - Proble PO5- Mo idual or	s. Networ em anal odern to team wo urse ou	rks to so lysis, PC ol usage ork, PO 10- tcomes	olve vario D ₃ - Desig e, PO ₆ - Th - Commun s with pro	ous clas m/devel e engine nication, ogram c	sification opment eer and s PO 11- Pr outcome	on and of sol society, oject m	utions, T PO 7- En anageme	PO₄ - C vironme nt and f	onduct ent and	
PO ₁ - Engineerin investigations of sustainability, PC PO ₁₂ - Life-long L	optimiz Apply A regress Mg Knowled Complex pr Ds- Ethics, P	ation pr rtificial ion prol ge, PO ₂ oblems, O ₉ - Indiv	roblems Neural blems. - Proble PO5- Mo idual or	5. Networ em anal odern to team wo	rks to so lysis, PC ol usage ork, PO 10-	olve vario D ₃ - Desig e, PO 6- Th - Commu	ous clas n/devel e engine nication,	sificatio opment eer and s PO 11- Pr	on and of sol society, oject m	utions, 1 PO 7- En	PO₄ − C vironme	onduct ent and inance,	
PO ₁ - Engineerin investigations of sustainability, PC PO ₁₂ - Life-long L Course	optimiz Apply A regress ng Knowled complex pr Ds- Ethics, Pr Learning	ation pro rtificial ion prol ge, PO ₂ oblems, O ₉ - Indiv Mappir	roblems Neural blems. - Proble PO5- Mo idual or	s. Networ em anal odern to team wo urse ou	rks to so lysis, PC ol usage ork, PO 10- tcomes	olve vario D ₃ - Desig e, PO ₆ - Th - Commun s with pro	ous clas m/devel e engine nication, ogram c	sification opment eer and s PO 11- Pr outcome	on and of sol society, oject m	utions, T PO 7- En anageme	PO₄ - C vironme nt and f	onduct ent and inance, PO 1	
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PO ₁ - Engineerin investigations of sustainability, PC PO ₁₂ - Life-long L Course Outcomes CO ₁ CO ₂	optimiz Apply A regress g Knowled complex pr D8- Ethics, Pr Learning PO1	ation pr rtificial ion prol ge, PO₂ oblems, O₂- Indiv Mappir PO₂ 2	roblems Neural blems. - Proble PO5- Mo idual or	s. Networ em anal odern to team wo urse ou	rks to so lysis, PC ol usage ork, PO 10- tcomes	olve vario D ₃ - Desig e, PO ₆ - Th - Commun s with pro	ous clas m/devel e engine nication, ogram c	sification opment eer and s PO 11- Pr outcome	on and of sol society, oject m	utions, T PO 7- En anageme	PO₄ - C vironme nt and f	onduct ent and inance, PO 1	
PO ₁ - Engineerin investigations of sustainability, PC PO ₁₂ - Life-long L Course Outcomes CO ₁	optimiz Apply A regress g Knowled complex pr D8- Ethics, Pr Learning PO1	ation pr rtificial ion prol ge, PO ₂ oblems, D ₉ - Indiv Mappir PO ₂ 2	Neural blems. - Proble PO5- Mo idual or ng of co PO3	s. Networ em anal odern to team wo urse ou PO 4	rks to so lysis, PC ol usage ork, PO 10- tcomes	olve vario D ₃ - Desig e, PO ₆ - Th - Commun s with pro	ous clas m/devel e engine nication, ogram c	sification opment eer and s PO 11- Pr outcome	on and of sol society, oject m es PO ₉	utions, T PO 7- En anageme	PO₄ - C vironme nt and f	onduct ent and inance, PO 1	
PO ₁ - Engineerin investigations of sustainability, PO PO ₁₂ - Life-long L Course Outcomes CO ₁ CO ₂ CO ₃	optimiz Apply A regress g Knowled complex pr D8- Ethics, Pr Learning PO1	$\begin{array}{c} \begin{array}{c} a \\ tion \ pi \\ rtificial \\ ion \ prol \\ ge, \ \mathbf{PO}_2 \\ oblems, \\ \mathbf{O}_9 - Indiv \\ \hline \mathbf{Mappir} \\ \mathbf{PO}_2 \\ \hline 2 \\ \hline 2 \\ \hline \end{array}$	POS- Moint POS- POS- POS- POS- POS- POS- POS- POS-	s. Networ em anal odern to team wo urse ou PO 4 2 2 2	rks to so lysis, PC ol usage rk, PO 10- tcomes PO 5	olve varie D ₃ - Desig p, PO ₆ - Th - Communi- s with pro- PO ₆	ous clas n/devel e engine nication, ogram c PO7	sification opment eer and s POn- Pr outcome POs	on and of sol society, oject m es PO ₉	utions, T PO 7- En anageme	PO₄ - C vironme nt and f	onduct ent and inance, PO 1	
PO ₁ - Engineerin investigations of sustainability, PC PO ₁₂ - Life-long L Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄	optimiz Apply A regress mg Knowled complex pr Ds- Ethics, Pr Learning PO1 2	$\begin{array}{c} \begin{array}{c} a \\ tion \ pi \\ rtificial \\ ion \ prol \\ ge, \ \mathbf{PO}_2 \\ oblems, \\ \mathbf{O}_9 - Indiv \\ \hline \mathbf{Mappir} \\ \mathbf{PO}_2 \\ \hline 2 \\ \hline 2 \\ \hline \end{array}$	POS- Moint POS- POS- POS- POS- POS- POS- POS- POS-	s. Networ em anal odern to team wo urse ou PO 4 2 2 2	rks to so lysis, PC ol usage rk, PO 10- tcomes PO 5	olve vario D ₃ - Desig e, PO ₆ - Th - Commun s with pro	ous clas n/devel e engine nication, ogram c PO7	sification opment eer and s POn- Pr outcome POs	on and of sol society, oject m es PO ₉	utions, T PO 7- En anageme	PO₄ - C vironme nt and f	onduct ent and inance, PO 1	
PO ₁ - Engineerin investigations of sustainability, PC PO ₁₂ - Life-long L Course Outcomes CO ₁ CO ₂ CO ₃	optimiz Apply A regress g Knowled complex pr 08- Ethics, Pr Learning PO1 2 2 ents:	ation pr rtificial ion prol ge, PO₂ oblems, O₀- Indiv Mappir PO₂ 2 2 2 1 Introc comp applic	roblems Neural blems. - Proble PO₅- Mo idual or mg of co PO₃ - PO₃ - 2 - Rease duction iting ver	s. Networ em anal odern to team wo urse ou PO4 2 2 onable; to So: rsus "Ha of Soft co	rks to so ol usage rk, POto- tcomes PO5 2 - Sigr ft Com ard" Co comput:	olve varie olve varie D ₃ - Desig PO ₆ - Th - Community with pro- PO ₆ poly nificant; mputing, mputing, ing technic	pus clas pous clas perminication, pgram c PO7 PO 7 3 – Stro Concep , Charao niques	sificatio opment er and s PO ₁ - Pr utcomo PO ₈ ng ot of c cteristic	on and of sol society, oject m es PO ₉ 1 1 omput cs of So	PO10 PO10 PO10 ing sys	PO ₄ - C vironme nt and f PO ₁₁ tems, puting,	onduct ent and inance, PO ₁ 2 	
PO ₁ - Engineerin investigations of sustainability, PO PO ₁₂ - Life-long L Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conte	optimiz Apply A regress g Knowled complex pr D8- Ethics, Pu Learning PO1 2 2 ents:	ation pr rtificial ion prol ge, PO₂ oblems, O₀- Indiv Mappir PO₂ 2 2 2 2 2 2 1 1 Introc comp applic Fuzzy Opera infere	PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3	s. Networ em anal odern to team wo urse ou PO4 2 2 PO4 2 C 2 C 5 C 5 Soft C ntroduc n Fuzzy Defuzzif	rks to so ol usage ork, POto- tcomes PO5 2 - Sigr ft Com ard" Cos comput: ction to sets., Fr	olve varie D_3 - Desig PO_6 - Th- - Community with pro- PO_6 PO_6 ificant; mputing, mputing	pus clas m/devel e engine nication, ogram c PO7 PO 7 3 - Stro Concep , Charao niques gic.,Fuz tions, r	sification opment er and s POn- Pr utcome POs pot of c cteristic zy sets s ules, pro	on and of sol society, oject m es PO ₉ 1 1 comput cs of So and me opositi	PO ₇ - En anageme PO ₇ - En anageme PO ₁₀ ing sys oft comp embersh ons, imp	PO4- C vironme nt and f PO11 tems, puting, ip func	PO1 2 "Soft" Some tions.,	
PO ₁ - Engineerin investigations of sustainability, PO PO ₁₂ - Life-long L Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conte Unit: 1	optimiz Apply A regress ng Knowled complex pr Ds- Ethics, Pr earning PO1 2 2 ents:	ation pr rtificial ion prol ge, PO2 oblems, O9- Indiv PO2 2 2 2 2 2 2 1 1 Introc comp applic Fuzzy Opera infere applic Genet to pr archit	roblems Neural blems. - Proble PO 5- Mo idual or PO 5- Mo idual or PO 3 PO 3 2 - Rease luction iting veres ations of nces., I sations of cic Algoro oablistic sectures	s. Networ em anal odern to team wo urse ou PO4 2 2 2 0nable; to So: rsus "Ha of Soft on n Fuzzy Defuzzif of Fuzzy rithms: c searcos, GA op	rks to so ol usage ol usage rk, PO_{10} - tcomes PO_5 PO_5 2 - Sigr ft Com ard" Co comput ction to sets., Fr fication y logic. Concep th tech perators	olve varie olve varie D_3 - Desig P_3 - Desig P_6 - Th- - Communi- s with pro- PO6 PO6 PO6 rificant; using techning ing techning Fuzzy log uzzy relation techning techning ot of "Gen- niques, s: Encod	pus clas m/devel e engine nication, pgram c PO7 PO7 3 - Stro Concep , Charae niques gic.,Fuz tions, r ues. Fu metics" : Basic (ing, Cro	sification opment eer and s PO ₁₁ - Pr PO ₈ PO ₈ mg ot of c cteristic zy sets s ules, pro- zzy log and "Ev- GA fran- ossover	on and of sol society, oject m es PO ₉ 1 1 omput es of Sc and me opositi ic cont olution neworl , Selec	PO10 PO10 PO10 PO10 ing sys oft comp embersh ons, imp croller d	PO4- C vironme nt and f PO11 tems, puting, ip func plicatio lesign., s applic	PO1 2 "Soft" Some tions. ns and some cation t GA	
PO ₁ - Engineerin investigations of sustainability, PC PO ₁₂ - Life-long L Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conte Unit: 2	optimiz Apply A regress g Knowled complex pr D8- Ethics, Pu eerning PO1 2 2 ents: 1	ation pr rtificial ion prol ge, PO₂ oblems, O₀- Indiv Mappir PO₂ 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	roblems Neural blems. - Proble PO 5- Ma idual or PO 5- Ma idual or PO 5- Ma regional of the sector PO 3 2 2 2 - Rease duction iting vere reations of nces., I reations of nces., I reations of cic Algor oablistic rectures reg single -objecti ization	s. Networ em anal odern to team wo urse ou PO4 2 2 2 0 nable; to So rsus "H of Soft of ntroduc n Fuzzy Defuzzif of Fuzzy rithms: c searco s, GA op e-object ve Opt probler Algorit	rks to so ol usage ork, POto- tcomes PO5 PO5 2 - Sign ft Com ard" Cos comput: ction to sets., Fr fication y logic. Concep th tech perators tive opt imization ns (MO chm (M	olve varie olve varie D_3 - Desig P_3 - Desig P_6 - Th- - Communi- s with pro- PO6 PO6 PO6 rificant; nputing, mputing, mputing, ing techning ing techning ing techning techning techning ot of "Gen- niques,	pus clas m/devel e engine nication, ogram c PO7 PO7 3 - Stro Concep , Charao niques gic.,Fuz tions, r ues. Fu hetics" a Basic C ing, Cro n proble em Sol d issues on-Pare	sification opment eer and s POn- Pr utcome POs POs mg ot of c cteristic zy sets s ules, pro- zzy log and "Ev- GA fran- possover ems usin ving: C of solv to app	on and of sol society, oject m es PO ₉ 1 1 omput cs of So and me opositi ic cont olution neworl , Selec oncept ing the roache	PO10 PO10 PO10 PO10 PO10 ing sys oft comp embershons, imp croller d tion, Mu s to so	PO4- C vironme nt and f PO11 tems, puting, ip func blicatio lesign., s applic lifferen utation lti-obje lti-Obje lve MC	PO, 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	

	Trainging techniques for ANNs., Applications of ANNs to solve some real life problems.
Exar	nination and Evaluation Pattern: It include both internal evaluation (30 marks) comprising two class
sess	ional exams/assignments/quiz/seminar presentation etc. and external evaluation (70 marks) which
is m	ainly end semester examination.
Text	t Books:
1	Fuzzy Logic: A Pratical approach, F. Martin, , Mc neill, and Ellen Thro, AP Professional, 2000.
2	Foundations of Neural Networks, Fuzzy Systems, and Knowldge Engineering, Nikola K. Kasabov, MIT
	Press, 1998.
3	An Introduction to Genetic Algorithms, Melanie Mitchell, MIT Press, 2000.
Refe	erence Books:
1	Fuzzy Logic with Engineering Applications (3rd Edn.), Timothy J. Ross, Willey, 2010.
2	Genetic Algorithms In Search, Optimization And Machine Learning, David E. Goldberg, Pearson
	Education, 2002.

Course Code BTCS839PET			Course Title Le										Semester:		
				Speech and Natural Language Processing L								Р	VIII		
Version: 1.2			Date of Approval: 16th BoS 17-11-2022 3								1	0			
		neme of						5	Scheme			ion			
		eriods) Hrs.						imum		:	100	1	
Period			: 4						Interna			:	30		
		redits	: 4							nd Sen		:	70		
Instructi				ecture					Exa	am Du	ration	:	3 H	rs.	
Prerequisite(s):			Learnin	g											
Course Objectiv				61 .	NUD	1.1	. 1	1 4	1 1						
 To underst To learn ba To underst statistics. To acquire 	isic tano <u>the</u>	progra d some	mming e of the	tools fo e proble	or NLP. ems an	d solut	ions of	NLP a	nd thei	r relat	tion to	lingu	istics a	ınd	
Course Outcom	les	(CO):													
COs No.					Sta	tement							Prograi es (POs		
CO ₁					Express							PO ₁ ,			
CO_2			-		analysis			-	nmars		PO ₂				
CO ₃					y for ev							PO 3,			
CO ₄	I	mplem	ent a si	mple N	LP syste	em to so	olve rea	l life pr	oblem		PC) 3, PO 4,	PO ₅ , PO ₅	9	
sustainability, PO PO₁₂- Life-long Le		ing			team wo					nes		ment	and fina	nce	
Course Outcomes		PO ₁	PO ₂	PO ₃	PO ₄	PO ₅	PO ₆	PO ₇	PO ₈	9 9	PO ₁	РО	n P	O 12	
CO ₁		2	2												
CO ₂			2	-		-									
CO ₃				2	-	2									
CO ₄				2	2	2			l	1					
Detailed Conta		_		– Reas	onable;	2 – Sigi	iijicant	; 3 - Sti	rong						
Detailed Conte	nts:		OVEL	X ZIEXAZ			OCV								
Unit: 1	OVERVIEW AND MORPHOLOGYUnit: 1Introduction - Models - and AlgorithmsRegularUnit: 1Expression Patterns - Finite State Automata. MMorphology - Derivational Morphology. Finite-StatePorter Stemmer							Mor	phology	y - I	nflectio	ona			
Unit: 2	WORD LEVEL AND SYNTACTIC ANALYSIS N-grams Models of Syntax - Counting Words - Unsmoo Unit: 2 Smoothing- Backoff DeletedInterpolation - Entropy - I Tagsets for English Part of Speech Tagging-Rule Based I - Stochastic Part of Speech Tagging - Transformation-B									English Part of	Word Speed	l Classe ch Tagg			
Unit: 3 CONTEXT FREE GRAMMARS Context Free Grammars for English Syntax- Context Sentence- Level Constructions- Agreement - Sub Cator Top-down - Earley Parsing - feature Structures - Pr Grammars								ontext ub Ca	Free R tegoriz	ules a ation.	and Tre Parsin	g -			
Unit: 4 Unit: 4 SEMANTIC ANALYSIS Representing Meaning - Meaning Structure of Language Calculus. Representing Linguistically Relevant Con Semantic Analysis - Semantic Attachments -SyntaxDr Analysis - Lexemes and Their Senses - Internal SenseDisambiguation -Information Retrieval									ncepts riven A Struct	-Syı nalyz	ntaxDri er. Rob	ver oust			
Unit: 5			LANGUAGE GENERATION AND DISCOURSE ANALYSIS Discourse -Reference Resolution - Text Coherence - Discourse Structure - Coherence. Dialog and Conversational Agents - Dialog Acts - Interpret ation -												

		Conversational Agents. Language Generation - Architecture - Surface
		Realizations - Discourse Planning
		Machine Translation -Transfer Metaphor–Interlingua – Statistical Approaches
Exar	nination and Evaluat	ion Pattern: It include both internal evaluation (30 marks) comprising two class
sess	ional exams/ assignm	ents/ quiz/ seminar presentation etc. and external evaluation (70 marks) which
is m	ainly end semester ex	amination.
Text	: Books:	
1	Daniel Jurafsky and	James H Martin, "Speech and Language Processing: An introduction to Natural
	Language Processing	g, Computational Linguistics and Speech Recognition", Prentice Hall, 2nd Edition,
	2008	
Refe	erence Books:	
1	C. Manning and H. S	chutze, "Foundations of Statistical Natural Language Processing", MIT Press.
	Cambridge, MA:,1999	
2	C. Manning and H. S	chutze, "Foundations of Statistical Natural Language Processing", MIT Press.
	Cambridge, MA:,1999	

Course Co					ourse Ti					ture	Sen	nester:
BTCS840P	ET				nine Lea	0			L	T P		VIII
Version: 1.2				Approv	al: 18th	BoS 27-			3	1 0		
	cheme o						2			nination		100
	Periods		Hrs.							n Score		100
Periods	1	: 4						Inter		luation		30 70
Instructio	Credits p Mode		cture					1		emester uration	-	70 3 Hrs.
Prerequisite(s):				Noro U	auging				Exam D	uration	•	5 HIS.
Course Objectiv		iiiig aii	u Data	valein	Jusing							
 To underst learning alg To become To learn mo performand To provide 	gorithms. familiar ethodolo ce. <u>the conc</u>	with sp gy and	ecific, v tools to	videly u apply 1	sed ma nachine	chine lea e learnin	arning a g algor	algorith ithms to	ms. o real da		0	
Course Outcom	es (CO):									-		
COs No.				S	tateme	nt					-	rogram s (POs)
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CO ₂	U		U U	0	0	ms to da					O ₂ , PO ₃	, PO 5
CO ₃	Apply t applicat		ural Ne	tworks	and it	s usage	in ma	achine	learnin	g	PO ₄	
CO ₄			ation of	learning	g algori	thms and	d mode	l selecti	on.		PO ₄ , P	09
PO ₁₂ - Life-long Le	PO ₁	Mapp PO ₂	ing of c	ourse o	utcome PO5	s with p	rogram	outcon	nes PO ₉	PO ₁₀	PO	PO ₁
Outcomes			103	104	103	100	10/	108	105	1010	101	2
	2	2	0		0							-
		2	2	2	2							
CO ₃ CO ₄				2					1			
CO4			1 - Rea		2 - Sia	nificant	· 3 _ Sti	rona	1			
Detailed Conter	nts'		I NCU	Sonubic	2 Big	nycunc	,5 50	ong				
Unit: 1 Unit: 2		learni repre learni Decis induc inforr	ng. Asp sentation ng, Rein ion Tre tion of nation	oects o on, fund oforcem decisio gain. Se	f devel ction a <u>cent lear</u> ning: Re n trees earching	oping a pproxim rning, lea epresent . Picking g for sin	learni ation, arning a ting co g the b nple tr	ng syst supervi algorith ncepts est spli	em: tra sed lea <u>ms.</u> as deci tting at	olications aining d arning, sion tre ttribute: utationa	ata, c unsup es. Re entro	oncept ervised cursive py and
Unit: 3 Unit: 4		Enser of Le Comp hypot Rule Neuro Perce	nble Le carning baring le hesis te Learnin ons and ptrons:	Algorit arning a esting. g: Tran biologie repre	Bagging hms, M algorith slating o cal moti sentatio	Measurin Ims: cros decision ivation. I onal lin	ng, and ng the ss-valid trees in Linear t nitation	accura ation, le nto rule hreshol and	cy of earning s. Artifi d units gradier	nt desce	hypo and sta ral Ne ⁻ ent ti	theses atistica tworks raining
Unit: 5		intern Supp learni Bayes Paran	nediate ort Vec ng non- sian Lea	<u>Overfi</u> tor Ma -linear f arning: smoothi	tting, le chines: unctior theory ing. G	arning n Maxim ns. and Ba enerative	etwork um ma yes rul e vs.	structu rgin lir e. Naiv discrin	e Bayes	ers and <u>urrent n</u> parators s learnin e trainin lepender	etwori . Kern ng alg ng. L	ks. Iels for orithm

	Instance-Based Learning: Constructing explicit generalizations versus comparing to past specific examples. k-Nearest neighbour algorithm, Case-
	based learning.
Exa	mination and Evaluation Pattern: It include both internal evaluation (30 marks) comprising two class
sess	ional exams/ assignments/ quiz/ seminar presentation etc. and external evaluation (70 marks) which
is m	ainly end semester examination.
Text	t Books:
1	Machine Learning – Tom M. Mitchell, - MGH
2	Machine Learning: An Algorithmic Perspective, Stephen Marsland, Taylor & Francis (CRC)
Refe	erence Books:
1	Machine Learning Methods in the Environmental Sciences, Neural Networks, William W Hsieh,
	Cambridge Univ Press.
2	Chris Bishop, Neural Networks for Pattern Recognition, Oxford University Press, 1995

Course Co	de			Co	urse Tit	le			I	lecture		a .
UGCS611G		Soft	Skill an	d Inter	persona	al Comr	munica	ation	L	Т	Р	Semester
Version: 1.2					al: 16th				3	0	0	:VI
S	Scheme of	f Instru	ction					Schem	e of E	xamina	tion	
No. of	Periods		Hrs.					Ma	ximum	Score	:	100
Periods	s/Week	: 3						Intern	al Eval	uation	:	30
	Credits	: 3						E	Ind Sei	mester	:	70
Instructio			cture					Ex	am Du	ıration	:	3 Hrs.
Prerequisite(s):		ic pre-ı	requisit	es.								
Course Objectiv												
1. To learn the								_				
2. To apply the										ctice.		
3. To understa							scussi	ons skil	ls.			
4. To develop		agemen	it and s	tress m	anagem	ient.						
Course Outcom	es(CO):			04.0								
COs No.				Sta	tement							Program
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00	everyda	<i>v</i> 1				4.4.7.7						0
CO_3	Demons discussi			nportar	ice of	team	work	and	group		PO _{9,} P	U 10
CO ₄				monto	nd stro	a mon	adama	nt			PO	
PO ₁ - Engineering	Establis								nt of	solution		
investigations of c sustainability, PO finance, PO ₁₂ - Life	8- Ethics, I	PO ₉ - Ind										
,		0										
		Mappin	g of co	urse ou	tcomes	with p	rogran	n outco	mes			
Course					tcomes		rogran PO		mes PO	во	ро	DO
Course Outcomes	PO ₁	Mappin PO2	g of con PO ₃	urse ou PO ₄	tcomes PO ₅	with p PO ₆		n outco PO ₈		PO ₁₀	РО	P11 PO ₁₂
							PO		РО	PO ₁₀	РО	P11 PO ₁₂
Outcomes CO ₁ CO ₂						PO ₆	PO		99	3	PO	P11 PO ₁₂
OutcomesCO1CO2CO3						PO ₆	PO		РО	3	PO	P11 PO ₁₂
Outcomes CO ₁ CO ₂		PO ₂	PO ₃	PO ₄	PO ₅	PO ₆ 2 2	PO 7	PO ₈	99	3	PO	P11 PO ₁₂
Outcomes CO1 CO2 CO3 CO4	PO1	PO ₂	PO ₃	PO ₄		PO ₆ 2 2	PO 7	PO ₈	99	3	PO	P11 PO ₁₂
OutcomesCO1CO2CO3	PO1	PO ₂	PO3 - Reaso	PO ₄	PO5 2 - Sign	PO ₆ 2 2 iificant	PO 7 ; 3 - S	PO ₈	PO 9 2	3 3 3		
Outcomes CO1 CO2 CO3 CO4	PO1	PO ₂	PO3 - Reaso	PO ₄	PO5 2 – Sign	PO ₆ 2 2 iificant	PO 7 ; 3 - S a: The	PO ₈	PO 9 2 ance c	3 3 3 of Comr	nunica	ation; The
Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conter	PO1	PO ₂ 1 Funda Basic	PO ₃ - Reaso	PO4	PO ₅ 2 – Sign ommun munica	PO ₆ 2 2 ificant ication tion; T	PO 7 ;; 3 - S :: The the Pro	PO ₈ trong	PO 9 2 ance c f Com	3 3 3 of Comr municat	nunica tion; E	ation; The Barriers to
Outcomes CO1 CO2 CO3 CO4	PO1	PO2 1 Funda Basic Comm	PO ₃ - Reaso mental Forms unicat:	PO4 onable; Is of Cont of Cont ion;	PO ₅ 2 – Sign ommun munica Deali	PO ₆ 2 2 iificant ication tion; T ng	PO 7 ; 3 - S :: The 'he Prowith	PO ₈	PO 9 2 ance c f Com	3 3 3 of Communication	nunica tion; E	ation; The Barriers to Barriers.
Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conter	PO1	PO2 1 Funda Basic Comn Nonve	PO ₃ – Reason mental Forms nunicati erbal C	PO4 pnable; Is of Con ion; Commu	PO ₅ 2 – Sign ommun munica Deali nication	PO ₆ 2 2 iificant ication ition; T ng n: Char	PO 7 ; 3 – S a: The 'he Pro with acteris	PO ₈ trong Import ocess o C	PO 9 2 ance c f Com	3 3 3 of Communication	nunica tion; E	ation; The Barriers to
Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conter	PO1	PO2 1 Funda Basic Comm Nonve Comp	PO ₃ – Reason mental Forms nunicati erbal C onents	PO4 pnable; ls of Com ion; commu of Non	PO5 2 – Sign ommun munica Deali nication verbal (PO ₆ 2 2 iificant ication ition; T ng n: Char Commu	PO 7 ; 3 – S :; 3 – S :: The 'he Pro with acteris inicatio	PO ₈ trong Import ocess o C stics of on.	PO 9 2 ance c f Com Commu	3 3 3 of Communication unication verbal (nunica tion; E n Comm	ation; The Barriers to Barriers. unication;
Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conter	PO1	PO2 1 Funda Basic Comm Nonvo Comp Lister	PO ₃ – Reason mental Forms nunicati erbal C onents ing: Im	PO ₄ pnable; ls of Com ion; commu of Non portan	PO5 2 – Sign ommun munica Deali nication verbal C ce of	PO ₆ 2 2 ificant ication ition; T ng n: Char Commu Lister	PO 7 ; 3 - S :; 3 - S :: The 'he Pro with acteris inication ning;	PO ₈ trong Import ocess o Cotics of on. Barrie	PO 9 2 2 ance c f Com Commu 3 Nonv rs to	3 3 3 of Communicatio verbal (Effec	nunica tion; E n Comm tive	ation; The Barriers to Barriers. unication; Listening;
Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conter	PO1	PO2 1 Funda Basic Comp Lister Appro	PO ₃ – Reason mental Forms nunicati erbal C onents ning: Im aches t	PO4 pnable; ls of Com ion; commu- of Non aportan co Liste	PO5 2 – Sign munica Deali nication verbal C ce of ning; Ho	PO ₆ 2 2 ificant ication ition; T ng n: Char Commu Lister	PO 7 ; 3 - S :; 3 - S :: The 'he Pro with acteris inication ning;	PO ₈ trong Import ocess o Cotics of on. Barrie	PO 9 2 2 ance c f Com Commu 3 Nonv rs to	3 3 3 of Communicatio verbal (Effec	nunica tion; E n Comm tive	ation; The Barriers to Barriers.
Outcomes CO1 CO2 CO3 CO4 Detailed Conter Unit: 1	PO1	PO2 1 Funda Basic Comp Lister Appro to Ens	PO ₃ – Reason mental Forms nunicati erbal C onents ing: Im aches t sure Bet	PO ₄ mable; onable; of Com ion; commun of Non portan to Liste tter List	PO5 2 - Sign munica Deali nication verbal C ce of ning; Ho tening.	PO ₆ 2 2 iificant ication tion; T ng n: Char Commu Lister ow to b	PO 7 ; 3 - S :; 3 - S :: The 'he Pro with acteris unication ning; pe a Be	PO ₈ trong Import ocess o Catics of on. Barrie etter Lis	PO 9 2 ance c f Com Commu 7 Nony rs to stener;	3 3 3 of Communical unicatio verbal (Effec ; What S	nunica tion; E n Comm tive Speake	ation; The Barriers to Barriers. unication; Listening; ers can do
Outcomes CO1 CO2 CO3 CO4 Detailed Conter Unit: 1	PO1	PO2 1 Funda Basic Comp Lister Appro to Ens Interp	PO ₃ – Reason mental Forms nunicati erbal C onents ning: Im paches t sure Bet persona	PO4 pnable; onable; of Com ion; commu of Non portan to Liste tter List il Skills	PO5 2 - Sign munica Deali nication verbal C ce of ning; Ho tening.	PO ₆ 2 2 iificant ication tion; T ng n: Char Commu Lister ow to b ng Pos	PO 7 ; 3 - S :; 3 - S :: The 'he Pro with acteris unication ning; pe a Be	PO ₈ trong Import ocess o Catics of on. Barrie etter Lis	PO 9 2 ance c f Com Commu 7 Nony rs to stener;	3 3 3 of Communical unicatio verbal (Effec ; What S	nunica tion; E n Comm tive Speake	ation; The Barriers to Barriers. unication; Listening; ers can do
Outcomes CO1 CO2 CO3 CO4 Detailed Conter Unit: 1	PO1	PO2 1 Funda Basic Comm Nonvo Comp Lister Appro to Ens Interp with C	PO3 - Reason -	PO4 pnable; onable; onable; of Com ion; communic of Non portan co Liste tter List il Skills n; Mana	PO ₅ 2 - Sign ommun munica Deali nication verbal (ce of ning; Ho tening, S tening, S s: Buildi aging Co	PO ₆ 2 2 iificant ication ition; T ng n: Char Lister ow to b ng Pos onflict.	PO 7 ; 3 - S a: The Che Pro with acteris inication ning; be a Be sitive H	PO ₈ trong Import ocess o Cotics of on. Barrie etter Lis Relation	PO 9 2 ance c f Com Commu S Nonv rs to stener; ships;	3 3 3 of Communication verbal (Effec 5 What S Giving	nunica tion; E n Comm tive Speake Praise	ation; The Barriers to Barriers. unication; Listening; ers can do e; Dealing
Outcomes CO1 CO2 CO3 CO4 Detailed Conter Unit: 1 Unit: 2	PO1	PO2 Funda Basic Comm Nonve Comp Lister Approtones Interp with C Negot Prepa	PO ₃ – Reason mental Forms hunication erbal Conents hing: Im- aches to bersona Criticism- iations; ration;	PO₄ pnable; pnable; s of Com of Com ion; commut of Non aportan co Liste tter Liste il Skills n; Mana : Appro	PO ₅ 2 - Sign ommun amunica Deali nication verbal (ce of ning; Ho tening. s: Buildi aging Co aches t	PO ₆ 2 2 iificant ication ition; T ng n: Chart Commu Lister ow to b ng Pos onflict. o Nego	PO 7 ; 3 – S ; 5 – S ; 5 – S ; 5 – S ; 6 – S ; 6 – S ; 6 – S ; 7 – S ;	PO ₈ trong Import bcess o Concess of concess of conces	PO 9 2 ance of f Com Commu S Nonv rs to stener; ships; Aajor E	3 3 3 of Communication unication verbal (Effec What S Giving Element	nunica tion; E n Comm tive Speake Praise s of Ne	ation; The Barriers to Barriers to Barriers. unication; Listening; ers can do e; Dealing egotiation Situation.
Outcomes CO1 CO2 CO3 CO4 Detailed Conter Unit: 1	PO1	PO2 Funda Basic Comm Nonve Comp Lister Appro to Ens Interp with C Negot Prepa Interv	PO3 - Rease mental Forms nunicati erbal C onents ning: Im baches t sure Bet bersona Criticism iations ration; viewing	PO4 pnable; bnable; ls of Com ion; commut of Non ion; commut of Non ion; commut of Non ion; commut of Liste tter List ister List ist ist skills n; Mana ; Appro	PO ₅ 2 - Sign ommun amunica Deali nication verbal C ce of ning; Hu tening. s: Buildi aging C aches t iew an	PO ₆ 2 2 iificant ication ition; T ng n: Chart Commu Lister ow to b ng Pos onflict. o Nego	PO 7 ; 3 - S ; 5 - S ; 6 - S ; 6 - S ; 7 - S ;	PO ₈ trong Import bocess o Cotics of on. Barrie etter Lis Relation a; The M e Busine	PO 9 2 ance c f Com Commu 7 Nonv rs to stener; ships; aships; Aajor E ess In	3 3 3 of Communication (and the communication) (and the communication) (and the communication) (and the communication) (b) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c	nunica tion; E n Comm tive Speake Praise s of Ne s; Pla	ation; The Barriers to Barriers to Barriers. unication; Listening; ers can do e; Dealing egotiation Situation.
Outcomes CO1 CO2 CO3 CO4 Detailed Conter Unit: 1 Unit: 2	PO1	PO2 Funda Basic Comm Nonve Comp Lister Appro to Ens Intery with C Negot Prepa Interv Interv	PO ₃ – Reasc mental Forms nunicati erbal C onents ning: Im paches t sure Bet persona Criticism ration; ritations ratio; Co	PO4 pnable; ls of Com ion; commut of Non aportan to Liste tter List al Skills n; Mana : Appro	PO ₅ 2 - Sign ommun amunica Deali nication verbal C ce of ning; Ho tening. s: Buildi aging C aches t iew an ng an In	PO ₆ 2 2 iificant ication ition; T ng n: Char Commu Lister ow to b ng Pos onflict. o Nego ud Typ	PO 7 ; 3 - S ; 5 - S ; 5 - S ; 5 - S ; 6 - S ; 6 - S ; 6 - S ; 7 - S ;	PO ₈ trong Import bocess o Catics of on. Barrie etter Lis Relation a; The M e Busine Ethics	PO 9 2 2 ance c f Com commu 7 Nonv rs to stener; ships; aships; fajor E ess In of Inte	3 3 3 of Communicatio (rerbal (Effec What S Giving Element terview	nunica tion; E n Comm tive Speake Praise s of Ne s; Pla	ation; The Barriers to Barriers. unication; Listening; ers can do e; Dealing egotiation Situation. uning an
Outcomes CO1 CO2 CO3 CO4 Detailed Conter Unit: 1 Unit: 2	PO ₁	PO2 Funda Basic Comm Nonve Comp Lister Appro to Ens Interp with C Negot Prepa Interv Interv Interv	PO ₃ – Reasc mental Forms nunicati erbal C onents ning: Im paches t sure Bet persona Criticism ration; ritations ratio; Co	PO4 PO4 pnable; ls of Com of Com ion; commu of Non portan co Liste tter List il Skills ; Appro pnductin l Skills	PO5 2 - Sign ommun munica Deali nication verbal C ce of ning; Ho tening. s: Buildi aging Cc aches t riew an ng an In s: Buildi	PO ₆ 2 2 iificant ication ition; T ng i: Char Lister ow to b ng Pos onflict. o Nego id Typ iterviev ng Pos	PO 7 ; 3 - S ; 5 - S ; 5 - S ; 5 - S ; 6 - S ; 6 - S ; 6 - S ; 7 - S ;	PO ₈ trong Import Decess of Catics of Darrie Etter Lis Relation a; The M Busing Ethics Relation	PO 9 2 2 ance c f Com commu ? Nonv rs to stener; ships; Aajor E ess In of Inte iships;	3 3 3 of Communical unicatio verbal (Effec What S Giving Element terview rviewin Giving	nunica tion; E n Comm tive Speake Praise s of Ne s; Pla	ation; The Barriers to Barriers to Barriers. unication; Listening; ers can do e; Dealing egotiation. Situation. unning an e; Dealing
Outcomes CO1 CO2 CO3 CO4 Detailed Conter Unit: 1 Unit: 2	PO ₁	PO2 Funda Basic Comp Lister Appro to Ens Intery with C Negot Prepa Intery Untery With	PO3 - Reaso - Reaso	PO4 PO4 pnable; ls of Com of Com ion; commu of Non portan co Liste tter List il Skills ; Intervonductin il Skills (PO5 2 - Sign ommun munica Deali nication verbal C ce of ning; Ho tening. s: Buildi aging Cc aches t ning an In s: Buildi Criticism	PO ₆ 2 2 iificant ication ition; T ng n: Char Commu Lister ow to b ng Pos onflict. o Nego ud Typ iterviev ng Pos	PO 7 ; 3 - S ; 5 - S ;	PO ₈ trong Import ocess o Contics of Darrie Barrie Etter Lis Relation a; The M Busine Ethics Relation Mai	PO 9 2 ance c f Com comm comm stener; ships; Aajor E ess In of Inte ships; naging	3 3 3 of Communication verbal (Effect What S Giving Element terview rviewin Giving	nunica tion; E n Comm tive Speake Praise s of Ne s; Pla g Praise	ation; The Barriers to Barriers to Barriers. unication; Listening; ers can do e; Dealing egotiation. situation. uning an e; Dealing Conflict.
Outcomes CO1 CO2 CO3 CO4 Detailed Conter Unit: 1 Unit: 2 Unit: 3	PO ₁	PO2 Funda Basic Comm Nonve Comp Lister Appro to Ens Intery with C Negot Prepa Interv Interv With Negot	PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3	PO₄ PO₄ pnable; pnable; ls of Com of Com ion; commu of Non portan co Liste tter Liste tter Liste il Skills ; Intervonduction il Skills (Communication) ; Intervonduction il Skills (Communication) ; Intervonduction il Skills (Communication) ; Intervonduction il Skills (Communication) ; Intervonduction il Skills (Communication) ; Intervonduction il Skills (Communication) ; Intervonduction ; Interv	PO5 2 - Sign ommun munica Deali nication verbal (ce of ning; Ho tening. s: Buildi aging Co aches t riew an ng an In s: Buildi Criticisn aches t	PO ₆ 2 2 iificant ication ition; T ng n: Char Commu Lister ow to b ng Pos onflict. o Nego ud Typ iterviev ng Pos	PO 7 ; 3 - S ; 5 - S ;	PO ₈ trong Import ocess o Contics of Darrie Barrie Etter Lis Relation a; The M Busine Ethics Relation Mai	PO 9 2 ance c f Com comm comm stener; ships; Aajor E ess In of Inte ships; naging	3 3 3 of Communication verbal (Effect What S Giving Element terview rviewin Giving	nunica tion; E n Comm tive Speake Praise s of Ne s; Pla g Praise	ation; The Barriers to Barriers to Barriers. unication; Listening; ers can do e; Dealing egotiation. Situation. unning an e; Dealing
Outcomes CO1 CO2 CO3 CO4 Detailed Conter Unit: 1 Unit: 2 Unit: 3	PO ₁	PO2 Funda Basic Comm Nonve Comp Lister Approto to Ens Interry with C Negot Prepa Intervy Intervy With Negot	PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3	PO₄ PO₄ pnable; pnable; ls of Com of Com ion; commut of Non portan co Liste tter Liste l Skills n; Mana : Appro conducting l Skills (Conducting) conducting	PO ₅ 2 - Sign ommun munica Deali nication verbal (ce of ning; Ho tening. s: Buildi aging Co aches t riew an ng an In s: Buildi Criticism aches t uation.	PO ₆ 2 2 iificant ication ition; T ng n: Chart Commu Lister ow to b ng Poss onflict. o Nego d Typ terviev ng Pos n; o Nego	PO 7 ; 3 - S ; 5 - S ; 6 - S ; 6 - S ; 6 - S ; 7 - S ;	PO ₈ trong Import ocess o Contics of on. Barrie etter Lis Relation a; The M Busine Ethics Relation Man a; The M	PO 9 2 ance c f Com Commu 7 Nonv rs to stener; aships; aships; hajor E ships; haging Aajor E	3 3 3 of Communication verbal (verbal (verbal (S What S Giving Clement terview rviewing Giving Clement	nunica tion; E n Comm tive Speake Praise s of Ne g Praise s of Ne	ation; The Barriers to Barriers to Barriers. unication; Listening; ers can do e; Dealing egotiation Situation. nning an e; Dealing Conflict. egotiation
Outcomes CO1 CO2 CO3 CO4 Detailed Conter Unit: 1 Unit: 2 Unit: 3	PO ₁	PO2 Funda Basic Comm Nonve Comp Lister Approtone to Ense Interry with C Negot Prepa Interry with Negot Prepa Interry With	PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3	PO₄ PO₄ pnable; pnable; s of Com of Com ion; commut of Non aportan to Liste tter Liste al Skills n; Mana : Appro comutinal Skills (Commutinal (Commutinal Skills (Commutinal (Commutin	PO ₅ 2 - Sign ommun munica Deali nication verbal C ce of ning; Ho tening. s: Buildi aging Cc aches t riew an ng an In s: Buildi Criticism aches t uation. iew an	PO ₆ 2 2 2 iificant ication ition; T ng n: Charl Commu Lister ow to t ng Pos onflict. o Nego nd Typ terviev ng Pos n; o Nego dd Typ	PO 7 ; 3 - S ; 5 - S ; 6 - S ; 6 - S ; 6 - S ; 7 - S ;	PO ₈ trong Import bcess o Course of tics of barrie tter List Relation a; The M Busine Busine	PO 9 2 ance of f Com Commu 7 Nonv rs to stener; aships; aships; hajor E ships; haging Aajor F	3 3 3 of Communication (and the second secon	nunica tion; E n Comm tive Speake Praise s of No s; Pla s of No s; Pla	ation; The Barriers to Barriers to Barriers. unication; Listening; ers can do e; Dealing egotiation Situation. nning an e; Dealing Conflict. egotiation
Outcomes CO1 CO2 CO3 CO4 Detailed Conter Unit: 1 Unit: 2 Unit: 3	PO ₁	PO2 Funda Basic Comm Nonve Comp Lister Appro to Ens Intery with C Negot Prepa Intery with Negot Prepa Intery With Negot	PO3 - Reasc - Reasc	PO₄ pnable; pnable; s of Com of Com ion; commut of Non portan to Liste tter List il Skills n; Mana : Appro conduction il Skills (Commut in Skills : Appro The Sit : Interv conduction : Interv conduction : Interv conduction : Interv conduction : Interv conduction : Interv conduction : Interv conduction : Interv : Interv	PO ₅ 2 - Sign ommun munica Deali nication verbal C ce of ning; Ho tening. s: Buildi aging Cc aches t s: Buildi Criticism aches t uation. iew an ing an In	PO ₆ 2 2 2 iificant ication ition; T ng n: Char Commu Lister ow to b ng Pos onflict. o Nego nd Typ terviev ng Pos n; o Nego d Typ Interviev	PO 7 ; 3 - S ;; 5 - S ;; 7 - S	PO ₈ trong Import bcess o C stics of on. Barrie etter Lis Relation a; The N Busine Busine Busine Busine Busine Busine	PO 9 2 ance c f Com Commu 7 Nonv rs to stener; aships; Aajor E ess In of Inte ships; haging Aajor E	3 3 3 f Comr municatio verbal (Effec What S Giving Element terviewin Giving Element terview Interview	nunication; E n Comm tive Speake Praise s of Ne s; Pla s of Ne s; Pla	ation; The Barriers to Barriers to Barriers. unication; Listening; ers can do e; Dealing egotiation situation. nning an e; Dealing Conflict. egotiation inning an Ethics in
Outcomes CO1 CO2 CO3 CO4 Detailed Conter Unit: 1 Unit: 2 Unit: 3 Unit: 4	PO ₁	PO2 Funda Basic Comm Nonve Comp Lister Apprototo Ens Intery with C Negot Prepa Intery with Negot Prepa Intery with Negot Prepa	PO3 - Reasc - Reasc	PO₄ pnable; pnable; s of Com of Com ion; commut of Non portan to Liste tter List il Skills n; Mana : Appro conduction il Skills (Commut in Skills : Appro The Sit : Interv conduction : Interv conduction : Interv conduction : Interv conduction : Interv conduction : Interv conduction : Interv conduction : Interv : Interv	PO ₅ 2 - Sign ommun munica Deali nication verbal C ce of ning; Ho tening. s: Buildi aging Cc aches t s: Buildi Criticism aches t uation. iew an ing an In	PO ₆ 2 2 2 iificant ication ition; T ng n: Char Commu Lister ow to b ng Pos onflict. o Nego nd Typ terviev ng Pos n; o Nego d Typ Interviev	PO 7 ; 3 - S ;; 5 - S ;; 7 - S	PO ₈ trong Import bcess o C stics of on. Barrie etter Lis Relation a; The N Busine Busine Busine Busine Busine Busine	PO 9 2 ance c f Com Commu 7 Nonv rs to stener; aships; Aajor E ess In of Inte ships; haging Aajor E	3 3 3 f Comr municatio verbal (Effec What S Giving Element terviewin Giving Element terview Interview	nunication; E n Comm tive Speake Praise s of Ne s; Pla s of Ne s; Pla	ation; The Barriers to Barriers to Barriers. unication; Listening; ers can do e; Dealing egotiation Situation. nning an e; Dealing Conflict. egotiation

	mination and Evaluation Pattern: It include both internal evaluation (30 marks) comprising two class sional exams/assignments/quiz/seminar presentation etc. and external evaluation (70 marks) which
is m	nainly end semester examination.
Tex	t Books:
1	Sanjay Kumar and Pushpa Lata, "Communication Skills", Oxford University Press.
2	Krishna Mohan, Meera Banerji, "Developing Communication Skill", McMillan India Ltd.
Refe	erence Books:

1

Simon Sweeney, "English for Business Communication", Cambridge University Press.Caroline & Whitbeck, "Ethics in Engineering Practice and Research", Cambridge University Press. 2

Course Co	de			Co	urse Ti	tle			Le	ecture		~	
UGCS612G		Human	Resource	e Develop	ment and	Organiza	ational Be	haviour	L	Т	Р		ester
Version: 1.2]	Date of	Approv	v al: 16th	BoS 17	-11-2022	2	3	0	0	:	VI
S	Scheme of	f Instru	ction				S	Scheme	of Exa	minati	on		
No. of	Periods		Hrs.					Max	imum	Score	:	100	
Periods	s/Week	: 3						Interna	al Evalu	uation	:	30	
	Credits	: 3							nd Sen		:	70	
Instructio			ecture					Exa	am Du	ration	:	3 Hrs	s.
Prerequisite(s):		fic pre-	requisit	es.									
Course Objectiv													
1. To learn bes													
 To familiariz To acquire t 							nsvehor	notric t	octina				
4. To impart in											erci	ses (roun
projects, rol		onuoor	utive ie	arring	chut ch	ipituoiz			1 01 61	oup en	01 01		Stoup
Course Outcome													
COs No.				Sta	tement					Мар	ped	Prog	ram
												ies (P	
CO ₁	Underst	tand Or	ganizat	ional Be	ehaviou	r					Р	O ₆	
CO ₂	Improve	- Derson	nality								PO	PO ₁₀	
	-		-										
CO ₃	Build m											0 _{9,} PO	10
CO ₄	Able to	analyze	various	s selecti	ion tech	niques	in recr	uitment	t		PO ₆	PO ₁₀	
sustainability, PO 8 finance, PO 12- Life			dividual	or team	n work, I	PO 10- C	ommuni	cation, I	PO 11− P	roject m	ana	gemer	nt and
			g of co	urse ou	tcomes	with pi	rogram	outcom	les				
Course		Mappin	Ĭ		tcomes	-			nes PO			0	D O
Course Outcomes	PO ₁		ng of cou PO ₃	urse ou PO ₄	tcomes PO ₅	with pi PO ₆	rogram PO ₇	outcom PO ₈		PO ₁₀	Р	O 11	PO ₁₂
		Mappin	Ĭ			-			РО	PO ₁₀	Р	O11	PO ₁₂
Outcomes CO1 CO2		Mappin	Ĭ			PO ₆			99 9	2	Р	O11	PO ₁₂
OutcomesCO1CO2CO3		Mappin	Ĭ			PO ₆ 2 2 2 2			РО	2 2	Р	O ₁₁	PO ₁₂
Outcomes CO1 CO2		PO2	PO ₃	PO ₄	PO ₅	PO ₆ 2 2 2 2 2 2	PO ₇	PO ₈	99 9	2	P	O11	PO ₁₂
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OutcomesCO1CO2CO3	PO ₁	Mappin PO2 1	PO3 PO3	PO4	PO₅ 2 – Sign	PO ₆ 2 2 2 2 ificant	PO ₇	PO ₈	РО 9 2	2 2 2			
Outcomes CO1 CO2 CO3 CO4	PO ₁	Mappin PO2 1	PO ₃ – Reaso	PO ₄	PO₅ 2 - Sign	PO ₆ 2 2 2 ificant	PO ₇ ; 3 – Str Organi	PO ₈	PO 9 2	2 2 2 viour (C	•B) a	und H	uman
Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conten	PO ₁	Mappin PO2 1 Introc Resou	PO ₃ – Reaso luction	PO4	PO5 2 - Sign course V nent (PO ₆ 2 2 2 ificant: What is (HRM)	PO7 3 - Str Organi Differ	PO ₈	PO 9 2 l Behav	2 2 2 viour (C en con	•В) а	and H rates	uman and
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Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conten	PO ₁	Mappin PO2 1 Introc Resou develo HRM:	PO ₃ – Reasonal luction luction luction contrib	PO ₄	PO5 2 - Sign course V nent (PO ₆ 2 2 2 ificant What is (HRM) OB and ges wit	PO7 ; 3 – Str Organi Differ HRM at h sustai	PO ₈	PO 9 2 l Behav betwee ainable	2 2 2 viour (C en con	PB) a	and H rates ent O	uman and B and
Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conten	PO ₁	Mappin PO2 1 Introc Resou develo HRM: for su Know	PO ₃ – Reasonal luction lu	PO4 pnable; 2 to the of fanager organiz ution a le devel d Mana	PO5 2 - Sign course V nent (zations) nd linka opment aging Y	PO ₆ 2 2 2 <i>ificant</i> (HRM) OB and ges wit t practi (oursel)	PO7 ; 3 - Str Organi Differ HRM an h sustai tioners f Indivi	PO ₈	PO 9 2 l Behav betwee ainable 7 Impor	2 2 2 viour (C en con e develo rtance c	B) a poi pmo of O	and H rates ent O B and mod	uman and B and HRM lel of
Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conten	PO ₁	Mappin PO2 Introc Resou develo HRM: for su Know indivio	PO ₃ – Reasonal luction lu	PO4 pmable; 2 to the of fanager organiz ution as le devel d Mana haviour	PO5 2 - Sign course V nent (zations (nd linka lopment aging Y Values	PO ₆ 2 2 2 ificant: What is (HRM) OB and ges wit t practi 'oursel: ' Value	PO7 PO7 3 - Str Organi Differ HRM at h sustai tioners f Indiviss acros	PO ₈	PO 9 2 l Behav betwee ainable 7 Impor	2 2 2 viour (C en con e develo rtance c our: MA ofstede	B) a rpon of O JRS rs fr	and H rates ent O B and mod ramev	uman and B and HRM lel of vork);
Outcomes CO1 CO2 CO3 CO4 Detailed Conten Unit: 1	PO ₁	Mappin PO2 Introc Resou develo HRM: for su Know indivio Perso	PO ₃ – Reasonal luction luction urce M opment contrib stainable ing and dual be nality:	PO ₄ mable; 2 to the c fanager organiz ution ar le devel d Mana haviour Big five	PO5 2 - Sign course V nent (zations (nd linka opment aging Y Values e mode	PO ₆ 2 2 ificant: What is 'HRM) OB and ges wit t practi 'oursel: : Value el; MB'	PO7 PO7 3 - Str Organi Differ HRM ai h sustai tioners f Indivis s acros FI; Use	PO ₈ ong zational ence 1 nd Susta inability dual B s cultu of pe	PO 9 2 l Behav betwee ainable r Impor ehavio res (H rsonali	2 2 2 2 viour (C en con e develo rtance c our: MA ofstede ity test	PB) a pm. pf O MRS 's fr s; 1	and H rates ent O B and mod ramev Perso	uman and B and HRM lel of vork); nality
Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conten	PO ₁	Mappin PO2 Introc Resou develo HRM: for su Know indivio Perso attrib	PO ₃ – Reason luction luct	PO ₄ mable; 2 to the of lanager organiz ution an le devel d Mana haviour Big five fluencin	PO5 2 - Sign course V nent (zations (nd linka dopment aging Y Values e mode ng OB	PO ₆ 2 2 2 ificant; (HRM) OB and ges wit t practi (oursel) : Value el; MB' Emotio	PO7 PO7 3 - Str Organi Differ HRM au h sustai tioners f Indivis s across FI; Use pons: Ur	PO ₈ ong zational ence in ad Susta inability dual B s cultu of pe- iderstar	PO 9 2 l Behav betwee ainable r Impor ehavio res (H rsonal nding	2 2 2 2 viour (C en con e develo rtance c ofstede ity test emotio	B) a por pmo of O ARS c's fr s; 1 ns;	and H rates ent O B and mod ramev Perso Emot	uman and B and HRM lel of vork); nality tional
Outcomes CO1 CO2 CO3 CO4 Detailed Conten Unit: 1	PO ₁	Mappin PO2 Introc Resou develo HRM: for su Know indivio Perso attrib labou	PO3 PO3 - Reaso luction luction rrce M opment contrib stainab ing and dual be nality: utes in r; Emoti	PO ₄ mable; 2 to the of lanager organiz oution and le devel d Mana haviour Big five fluencin ional In-	PO5 2 - Sign course V nent (zations (nd linka dopment aging Y Values e mode ng OB telligend	PO ₆ 2 2 2 ificant (HRM) OB and ges wit t practi (oursel) : Value el; MB Emotic ce Attit	PO7 PO7 3 - Str Organi Differ HRM ai h sustai tioners f Indivi es acros FI; Use pns: Ur udes: Ai	PO ₈ ong zational ence I ad Susta inability dual B s cultu of pe iderstar ttitudes	PO 9 2 Behavio betwee ainable v Impor ehavio res (H rsonal: nding v/s va	2 2 2 2 viour (C en con e develo rtance c our: MA ofstede ity test emotio alues; Jo	B) a pma of O ARS s; 1 ns; 2 b Sa	and H rates ent O B and mod ramev Perso Emot atisfa	uman and B and HRM lel of vork): nality tional ction;
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Outcomes CO1 CO2 CO3 CO4 Detailed Conten Unit: 1	PO ₁	Mappin PO2 Introc Resou develd HRM: for su Know indivia Perso attrib labou: Orgar Perce Motiv Conte motiv	PO ₃ – Reasc luction luction luction rrce M opment contrib stainab ing and dual be nality: utes in r; Emoti nization ptual er ation in emporar ation of	PO ₄ mable; : to the of fanager organiz ution a le devel d Mana haviour Big five fluencin ional In- al Com- rors; Se the wor- y theor	PO5 2 - Sign course V nent (zations) nd linka opment aging Y Values e mode ng OB telligen mitmen elf-fulfil orkplace ties of n workers	PO ₆ 2 2 <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ificant</i> <i>ifica</i>	PO7 PO7 ; 3 – Str Organi Differ HRM an h sustant tioners f Indivis s across fI; Use pons: Ur udes: Ar eption: 1 pophecy; is motivion; Des Teams	PO ₈ ong zational ence in ad Susta nability dual B s cultu of per aderstar ttitudes Factors Know y ration; I igning v/s gro	PO 9 2 1 Behave between ainable v Impor- ehavior res (H rsonal: nding v/s va influe yourse Early t motiva pups; V	2 2 2 2 2 viour (C en con e develo rtance c our: MA ofstede ity test emotio alues; Jc ncing p lf: Johan heories atting job	PB) a poi pmo of O IRS c's fr s; l b S c's fr of r of r os: J ms; J ms;	and H rates ent O B and mod camev Perso Emot atisfac eption indow notiva CM m	uman and B and HRM lel of vork); nality tional ction; n; 3 3 v ation; nodel; del of
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Outcomes CO1 CO2 CO3 CO4 Detailed Conten Unit: 1 Unit: 2	PO ₁	Mappin PO2 Introc Resou develo HRM: for su Know indivio Perso attrib labou: Orgar Perce Motiv Conte motiv Team teams Comn Forma	PO ₃ – Reasc luction rce M ppment contrib stainabl ing and dual be nality: utes in r; Emoti nization ptual er ation in effecti s; Turnin nunicati al netw	PO ₄ mable; : to the of fanager organiz oution as le devel d Mana haviour Big five fluencin ional In al Com rors; So the wo y theor social veness: ng indiv ion Wh orks as	PO5 2 - Sign course V nent (zations (nd linka lopment aging Y Values e mode ng OB telligen mitmen elf-fulfil orkplace ties of n workers Conte riduals in nat is o nd Graj	PO ₆ 2 2 2 <i>ificant</i> <i>ificant</i> <i>ficant</i> <i>ficant</i> <i>ficant</i> <i>ficant</i> <i>ficant</i> <i>formation</i> <i>ficant</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>for</i>	PO7 PO7 Grgani Differ HRM at h sustat tioners f Indivis s acros fI; Use ons: Ur udes: At eption: 1 ophecy; is motivion; Des tophecy; is motivion; Des tophecy; De	PO ₈ ong zational ence I ad Susta nability dual B s cultu of per aderstar titudes Factors Know y vation; I signing t v/s gro on, Wo rs n; Orga onic co	PO 9 2 1 Behavio betwee ainable 7 Impor ehavio res (H rsonali oding v/s va influe yourse Early t motiva bups; V rk des	2 2 2 2 2 viour (C en con- e develo rtance c our: MA ofstede ity test emotio alues; Jc ncing p lf: Johan heories titing job Vhy tean sign, Pr onal con- nication	PB) a point po	and H rates ent O B and mod ramev Perso Emot atisfac eption indow notiva CM m A mo- ess; V nunica Barrie	uman and B and HRM lel of vork); nality tional ction; n; 3 3 v ation; nodel; del of 'irtual ation: ers to
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Outcomes CO1 CO2 CO3 CO4 Detailed Conten Unit: 1 Unit: 2 Unit: 3	PO ₁	Mappin PO2 Introc Resou develo HRM: for su Know indivia Perso attrib labou Orgar Perce Motiv Conte motiv Team teams Comn Forma effect Interp	PO ₃ – Reasc luction rce M ppment contrib stainabi ing and dual be nality: utes in r; Emoti ization ptual er ation of effecti ;; Turnin nunicati al netw ive copersona	PO4 mable; : to the of fanager organiz oution as le devel d Mana haviour Big five fluencin ional In- al Com- rors; Se the wo y theor social veness: ng indivi ion Who orks an ommun l commu	PO5 2 - Sign course V nent (zations (nd linka lopment aging Y Values e mode ng OB telligen mitmen elf-fulfil orkplace ties of n workers Conte riduals in nat is o nd Graj	PO ₆ 2 2 2 <i>ificant</i> <i>ficant</i> <i>ficant</i> <i>ficant</i> <i>ficant</i> <i>ficant</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i> <i>formation</i>	PO7 PO7 S - Str Organi Differ HRM at h sustat tioners f Indivis s acros FI; Use ons: Ur udes: At eption: I ophecy; is motivion; Des Teams nposition m playe nication Electr - ver pathy an	PO ₈ ong zational ence I ad Susta nability dual B s cultu of per aderstar ttitudes Factors Know y vation; I signing : v/s grc on, Wo rs a; Orga onic co bal co ad Activ	PO 9 2 1 Behav betwee ainable 7 Impose ehavio res (H rsonali oding v/s va influe yourse Early t motiva pups; V rk des anizati ommur ommur e lister	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	B) a rpon pm of O IRS c's fr s; 1 of r of r os: J ms; coce omn s; F	and H rates ent O B and mod camev Perso Emot atisfac eption indow notiva CM m A mo ess; V nunica Barrie Impr	uman and B and HRM lel of vork); nality tional ction; n; 3 3 v ation; del of 'irtual ation: ers to oving

	external; Steps in selection process; Socialization and Induction; NGO recruitment
Exar	nination and Evaluation Pattern: It include both internal evaluation (30 marks) comprising two class
sess	ional exams/assignments/quiz/seminar presentation etc. and external evaluation (70 marks) which
is m	ainly end semester examination.
Text	Books:
1	McShane, S.L. and Von Glinow, M.A., Organizational Behaviour, New Delhi, Tata McGrawHill
	Publishing company ltd.
2	P. Jyothi, P. and Venkatesh, D.N., Human Resource Management, New Delhi, Oxford University
	Press
Refe	rence Books:
1	Denhardt, R.B., Denhardt, J.V., and Aristigueta, M.P. (2009), Managing Human Behaviour in Public
	and Non-Profit Organizations, Second edition. California, Sage Publications.
2	Pynes, J.E. (2004). Human Resources Management for Public and Nonprofit Organizations, Second
	Edition. San Francisco, CA: Jossey- Bass Publishers.

Course Co	de					urse Ti		•.			ture	Sem	ester:
UGCS613GET							per Secu				T P		VI
Version: 1.2					Approv	7 al: 16th	BoS 17-			-	0 0		
			Instru					S			ninatio	n I I	40.0
No. of				Hrs.						iximum		:	100
Periods	1		: 3							nal Eval		:	30
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Instructio				ture					E.	xam Du	iration	:	3 Hrs
Prerequisite(s):	-	ecin	ic pre-i	equisit	es.								
1. To create th		ic cl	arity an	d unde	rstandi	of cy	berlaws	and cyl	her seci	urity lay	ws to th	e	
professional			5			0 2		and cy	JCI SCC	unity la			
2. To emphasiz								ndividu	al or org	ranizati	ional pr	ivacy.	
3. To provide t								i ai i i a a		54111240	ionai pi	iraej.	
4. To understa								eventi	on.				
Course Outcome	es (CC):											
COs No.					St	atemen	t				Map	oed Pro	ogram
											Out	comes	(POs)
CO ₁							ecurity l	aws				PO ₁ , PO	
CO ₂				-	tion of c	-						D6, PO8, I	
CO ₃				eyber s	ecurity	vulner	abilities	and c	yber se	curity		PO ₅ , PO	8
	safe												
					plication					C 1		PO ₈ , PO	
PO ₁ - Engineering investigations of c													
sustainability, PO ₈ -													
PO ₁₂ - Life-long Lea			y mar	iuuui oi	cean wo	110,1010	commu	neucion,	101111	ojeceme	mugenne	int und i	mariee
9	U												
			Mappin	g of co	urse ou	tcomes	with pro	ogram o	outcom	es			
Course	D										PO	PO.	PO
Outcomes	P		PO ₂	ng of com PO ₃	urse ou PO4	tcomes PO₅	with pro PO ₆	ogram o PO ₇	PO ₈	es PO ₉	PO ₁₀	PO ₁₁	PO ₂
Outcomes CO ₁							PO ₆	PO ₇			PO ₁₀	PO ₁₁	2
Outcomes CO1 CO2		O 1	PO ₂			PO ₅			PO ₈		PO ₁₀	PO ₁₁	
OutcomesCO1CO2CO3		O 1	PO ₂				PO ₆	PO ₇	PO ₈	PO ₉	PO ₁₀	PO ₁₁	2
Outcomes CO1 CO2		O 1	PO ₂ 2	PO ₃	PO ₄	PO ₅	PO ₆	PO ₇	PO ₈		PO ₁₀	PO ₁₁	2
Outcomes CO1 CO2 CO3 CO4		O 1	PO ₂ 2	PO ₃	PO ₄	PO ₅	PO ₆	PO ₇	PO ₈	PO ₉	PO ₁₀	PO ₁₁	2
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		Authentication, Unprotected Broadband communications, Poor Cyber Security Awareness. Cyber Security Safeguards- Overview, Access control, Audit, Authentication, Biometrics, Cryptography, Deception, Denial of Service Filters, Ethical Hacking, Firewalls, Intrusion Detection Systems, Response, Scanning, Security policy, Threat Management.
	Unit: 5	Securing Web Application, Services and Servers: Basic security for HTTP Applications and Services, Basic Security for SOAP Services, Identity Management and Web Services, Authorization Patterns, Security Considerations, Challenges. Intrusion Detection and Prevention, Physical Theft, Abuse of Privileges, Unauthorized Access by Outsider, Malware infection, Intrusion detection and Prevention Techniques, Anti-Malware software, Network based Intrusion detection Systems
Exa	mination and Evaluat	ion Pattern: It include both internal evaluation (30 marks) comprising two class
sess	sional exams/ assignm	nents/ quiz/ seminar presentation etc. and external evaluation (70 marks) which
is m	nainly end semester ex	amination.
Tex	t Books:	
1	Karnika Seth, Comp	uters, Internet and New Technology Laws, Lexis NexisButterworthsWadhwa
	Nagpur.	
2	Chris Reed & John A	ngel, Computer Law, OUP, New York, (2007).
Ref	erence Books:	
1	JonthanRosenoer, C	yber Law, Springer, New York, (1997).
0		The shear the shear Ard 2005 A Headlersh OUD No. Vert (2011)

- 2 SudhirNaib, The Information Technology Act, 2005: A Handbook, OUP, New York, (2011)
- 3 S. R. Bhansali, Information Technology Act, 2000, University Book House Pvt. Ltd., Jaipur (2003).

Course Coo	le			Co	ourse T	itle			Leo	etur	e		
UGCS614GET		Comr	parative	_			ian Lan	nages	L	Т	Р		ester:
Version: 1.2							-11-202		3	0	0		VI
	cheme of							Scheme	of Exa	nina	ation	1	
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Periods	/ Week	: 3						Interr	nal Eva	luati	ion	:	30
	Credits	: 3]	End Se	mes	ter	:	70
Instructio	n Mode	: Leo	eture					E	xam Di	urat	ion	:	3 Hrs.
Prerequisite(s): 1		ic pre-i	equisit	es.									
Course Objective	es:												
Course Outcome	es (CO):									_			
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$\begin{array}{c} Course\\ \hline Outcomes\\ \hline CO_1\\ \hline CO_2\\ \hline CO_3\\ \hline CO_4\\ \end{array}$	PO ₁	PO ₂	PO ₃	PO ₄	PO ₅	PO ₆	rogram	PO ₈		P(O ₁₀	PO ₁₁	_
Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conten	PO ₁	PO ₂	PO ₃	PO ₄	PO ₅	PO ₆	PO7	PO ₈		P	O ₁₀	PO ₁₁	_
Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conten Unit: 1	PO ₁	PO ₂	PO ₃	PO ₄	PO ₅	PO ₆	PO7	PO ₈		P	O ₁₀	PO ₁₁	_
Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conten Unit: 1 Unit: 2	PO ₁	PO ₂	PO ₃	PO ₄	PO ₅	PO ₆	PO7	PO ₈			O ₁₀	PO ₁₁	_
Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conten Unit: 1	PO ₁	PO ₂	PO ₃	PO ₄	PO ₅	PO ₆	PO7	PO ₈		P	O ₁₀	PO ₁₁	_
Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conten Unit: 1 Unit: 2 Unit: 3	PO ₁	PO ₂	PO ₃	PO ₄	PO ₅	PO ₆	PO7	PO ₈		P.	O ₁₀	PO ₁₁	_
Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conten Unit: 1 Unit: 2 Unit: 3 Unit: 4	PO1 ts:	PO ₂	PO3 - Reaso	PO4	PO5 2 - Sign	PO ₆	rogram PO7 ; 3 - Stu	PO ₈	PO ₉	com	pris	ing two	2 2
Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conten Unit: 1 Unit: 2 Unit: 3 Unit: 3 Unit: 5 Examination and sessional exams/	PO1 ts:	PO ₂	PO3 - Reaso	PO4	PO5 2 - Sign	PO ₆	rogram PO7 ; 3 - Stu	PO ₈	PO ₉	com	pris	ing two	2 2
Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conten Unit: 1 Unit: 2 Unit: 3 Unit: 3 Unit: 5 Examination and sessional exams/ is mainly end ser	PO1 ts:	PO ₂	PO3 - Reaso	PO4	PO5 2 - Sign	PO ₆	rogram PO7 ; 3 - Stu	PO ₈	PO ₉	com	pris	ing two	2 2
Course Outcomes CO1 CO2 CO3 CO4 Detailed Conten Unit: 1 Unit: 2 Unit: 3 Unit: 3 Unit: 4 Unit: 5 Examination and sessional exams/ is mainly end ser Text Books: 1 2	PO1 ts: l Evaluat / assignm nester ex	PO ₂	PO3 - Reaso	PO4	PO5 2 - Sign	PO ₆	rogram PO7 ; 3 - Stu	PO ₈	PO ₉	com	pris	ing two	2 2
Course Outcomes CO₁ CO₂ CO₃ CO₄ Detailed Conten Unit: 1 Unit: 2 Unit: 3 Unit: 3 Unit: 4 Unit: 5 Examination and sessional exams/ is mainly end ser Text Books: 1	PO1 ts: l Evaluat / assignm nester ex	PO ₂	PO3 - Reaso	PO4	PO5 2 - Sign	PO ₆	rogram PO7 ; 3 - Stu	PO ₈	PO ₉	com	pris	ing two	2 2
Course Outcomes CO1 CO2 CO3 CO4 Detailed Conten Unit: 1 Unit: 2 Unit: 3 Unit: 3 Unit: 4 Unit: 5 Examination and sessional exams/ is mainly end ser Text Books: 1 2	PO1 ts: l Evaluat / assignm nester ex	PO ₂	PO3 - Reaso	PO4	PO5 2 - Sign	PO ₆	rogram PO7 ; 3 - Stu	PO ₈	PO ₉	com	pris	ing two	2 2

Course Co	ie				urse Ti				Leo	ture	Seme	ster.
UGCS615GET					sic Scier				L	Т Р	V	
Version: 1.2				Approv	r al: 16th	BoS 17	-11-202		3	0 0		1
	cheme of									minatio		
	Periods		Hrs.							n Score	: 10	
Periods	/ Week	: 3						Inter		luation	: 30	
Tu ad an ad 's	Credits	: 3	4							emester	: 70	
Instructio			ture	~~					Exam D	uration	: 3	Hrs.
Prerequisite(s):		ic pre-i	equisit	es.								
1. To introduce		cs of hi	ology si	ich as c	ell stru	cture a	nd fun	ctions				
 To learn the 						cture a	ina run	ctions.				
3. To understa												
4. To introduce												
Course Outcome	es (CO):											
COs No.				St	atemen	ıt				Марј	oed Pro	gram
										Outo	comes (POs)
CO ₁	Underst										PO ₇	
CO_2	Gain kn	-									PO7, PO1	
CO ₃	Explore										PO7, PO1	
CO ₄	Analyze							ty, organ	nization]	PO7, PO1	2
PO ₁ - Engineering	and fund							1		1		1
investigations of c sustainability, PO ₈ - PO ₁₂ - Life-long Lea	- Ethics, PC arning) ₀- Indiv	idual or	team wo	rk, PO 10-	Comm	unicatio	on, PO 11- I	Project n			
0		Марріг	ig of co	urse ou	tcomes	with p	rogran	n outcon	nes		1	DO
Course	PO ₁	PO_2	PO ₃	PO ₄	PO ₅	PO ₆	PO ₇	PO ₈	PO ₉	PO ₁₀	PO ₁₁	PO ₁
Outcomes CO ₁							2					2
							2					2
CO ₃							2					2
CO ₄	_						2					2
		1	- Reaso	onable; 2	2 – Sign	ificant	; 3 – St	rong	1			
Detailed Conten	ts:				U			Ū				
Unit: 1		Basics	: Divers	sity of lif	fe, prok	aryotes	s and e	ukaryote	es, basic	cell con	stituen	ts and
Unit. I		macro	molecu	ıles.								
Unit: 2					,				/	nd Bioen	0	
										etics, s		
Unit: 3				_		omoso	mes, '	ranscrip	otion a	nd Tran	slation,	gene
			ssion ai	nd regul							on sign	aling
				Maaran	ماموينار		hrono	a ordon				
Unit: 4		Cell B	iology: I					s, organ	elles, cy	toskelet	on, sigi	anng
		Cell B cell di	iology: I vision, o	differen	itiation,	motilit	y.	_	-		_	
Unit: 4 Unit: 5		Cell B cell di Micro	iology: 1 vision, o biology	differen	itiation,	motilit	y.	_	-	cology, c	_	
Unit: 5	l Evaluati	Cell B cell di Micro virolo	iology: 1 vision, o biology gy	differen : host-1	itiation, microbe	motilit e intera	zy. actions	, physio	logy, ee	cology, d	liversity	, and
Unit: 5		Cell B cell di Micro virolo ion Pat	iology: I vision, o biology gy tern: It	differen : host-1 include	itiation, microbe both ii	motilit e intera	y. actions evalua	, physio tion (30	logy, eo marks)	cology, c	liversity	, and
Unit: 5 Examination and sessional exams, is mainly end ser	∕ assignm	Cell B cell di Micro virolo ion Pat ents/ c	iology: 1 vision, o biology gy tern: It quiz/ se	differen : host-1 include	itiation, microbe both ii	motilit e intera	y. actions evalua	, physio tion (30	logy, eo marks)	cology, c	liversity	, and
Unit: 5 Examination and sessional exams, is mainly end ser Text Books:	/ assignm nester ex	Cell B cell di Micro virolo ion Pat ents/ c aminati	iology: vision, o biology gy tern: It luiz/ se ion.	differen : host-1 include eminar p	tiation, microbe both in present	motilit e intera nternal ation et	evalua tc. and	, physio tion (30 externa	logy, eo marks) l evalua	cology, c compris tion (70	liversity	, and
Unit: 5 Examination and sessional exams, is mainly end ser Text Books: 1 Biology: N.	/ assignm nester ex Campbell	Cell B cell di Micro virolo ion Pat ents/ c aminati	iology: 1 vision, 6 biology gy tern: It Juiz/ se ion. Reece (1	differen : host-1 include eminar p 2005) 7	tiation, microbe both in present th editio	motilit e intera nternal ation et on, Pea	evalua tc. and	, physio tion (30 externa Benjamin	logy, eo marks) l evalua ,Cumm	cology, c compris tion (70 ings	liversity ing two marks)	, and class which
Unit: 5 Examination and sessional exams, is mainly end ser Text Books: 1 Biology: N. 2 The Biolog	/ assignm nester ex Campbell ical Chem	Cell B cell di Micro virolo ion Pat ents/ c aminati	iology: 1 vision, 6 biology gy tern: It Juiz/ se ion. Reece (1	differen : host-1 include eminar p 2005) 7	tiation, microbe both in present th editio	motilit e intera nternal ation et on, Pea	evalua tc. and	, physio tion (30 externa Benjamin	logy, eo marks) l evalua ,Cumm	cology, c compris tion (70 ings	liversity ing two marks)	v, and class which
Unit: 5 Examination and sesssional exams, is mainly end ser Text Books: 1 Biology: N. 2 The Biolog UniversityB	/ assignm nester ex Campbell ical Chem Press	Cell B cell di Micro virolo ion Pat ents/ c aminati	iology: 1 vision, 6 biology gy tern: It Juiz/ se ion. Reece (1	differen : host-1 include eminar p 2005) 7	tiation, microbe both in present th editio	motilit e intera nternal ation et on, Pea	evalua tc. and	, physio tion (30 externa Benjamin	logy, eo marks) l evalua ,Cumm	cology, c compris tion (70 ings	liversity ing two marks)	, and class which
Unit: 5 Examination and sesssional exams, is mainly end ser Text Books: 1 Biology: N. 2 The Biolog UniversityB Reference Books	/ assignm nester ex Campbell ical Chem Press s:	Cell B cell di Micro virolo ion Pat ents/ c aminati and J. iistry o	iology: 1 vision, 4 biology gy tern: It quiz/ se ion. Reece (2 f the Ele	differen : host-1 include eminar p 2005) 7t ements	tiation, microbe both in present th edition : J.J.R.F.	motilit e internal ation et on, Pea da Silv	y. actions evalua tc. and rson, E ⁄a, R.J.I	, physio tion (30 externa Senjamin P. Williar	logy, ed marks) l evalua ,Cumm ns (200	cology, c compris tion (70 ings 1) 2nded	liversity ing two marks) v	v, and class which
Unit: 5 Examination and sessional exams/ is mainly end ser Text Books: 1 Biology: N. 2 The Biolog UniversityF Reference Books 1 Biology: P.F	/ assignm nester ex Campbell cal Chem Press s: H. Raven, 1	Cell B cell di Micro virolo ion Pat ents/ c aminati and J. iistry o G.B. Jol	iology: i vision, o biology gy tern: It juiz/ se ion. Reece (i f the Ele mson, J	differen : host-1 include eminar p 2005) 7 ements .B. Loso	tiation, microbe e both in present th editic : J.J.R.F.	motilit e internal ation et on, Pea da Silv	evalua evalua tc. and rson, E ra, R.J.I ger (20	, physio tion (30 externa <u>eenjamin</u> P. Williar 05) 7th e	logy, ed marks) l evalua , <u>Cumm</u> ns (200 edition,	cology, c compris tion (70 ings 1) 2nded McGraw	liversity ing two marks) ition, C	v, and o class which xford
Unit: 5 Examination and sessional exams, is mainly end ser Text Books: 1 Biology: N. 2 The Biolog University Reference Books	/ assignm nester ex Campbell cal Chem Press s: 1. Raven, Biology of	Cell B cell di Micro virolo ion Pat ents/ c aminati and J. histry o G.B. Joh the Ce	iology: i vision, o biology gy tern: It quiz/ se ion. <u>Reece (i</u> f the Elo <u>inson, J</u> ll: B. Alt	differen : host-1 include eminar p 2005) 7 ements .B. Loso	tiation, microbe e both in present th editic : J.J.R.F.	motilit e internal ation et on, Pea da Silv	evalua evalua tc. and rson, E ra, R.J.I ger (20	, physio tion (30 externa <u>eenjamin</u> P. Williar 05) 7th e	logy, ed marks) l evalua , <u>Cumm</u> ns (200 edition,	cology, c compris tion (70 ings 1) 2nded McGraw	liversity ing two marks) ition, C	v, and o class which xforc

Course C	ode			Co	ourse Ti	tle			Leo	Lecture		mester:
UGCS7110	GET		In	tellectu	al Prope	erty Rig	hts		L	ΤI	, 36	VII
Version: 1.2			Date of	f Approv	v al: 16th	BoS 17	-11-202	2	3	0 0)	VII
	Scheme	of Inst	ruction				ç	Scheme	of Exa	minati	on	
No. (of Periods	5 :	45 Hrs.					Ma	ximum	Score	:	100
Perio	ds/ Weeł	: :	3					Interr	nal Eval	uation	:	30
	Credits	:	3]	End Sei	mester	:	70
Instruct	tion Mode	:	Lecture					E	xam Dı	ıration	:	3 Hrs.
Prerequisite(s)	: No spec	ific pr	e-requisi	tes/awa	areness	of Cyb	er Law a	and Cyl	ber Sec	urity is	desir	able.
Course Objecti	ves:	1				<u>y</u>		<u> </u>		<u>y</u>		
1. To underst		undan	nental as	pects of	Intellec	tual pr	operty	Rights 1	to stud	ents w	10 are	going to
play a majo												0 0
2. To learn a												the legal
concepts in												0
3. To acquire												
4. To provide												
Course Outcon		1	0 0 1				-					
COs No.				Sta	tement	;				Мар	ped P	rogram
												s (POs)
CO ₁	Under	stand	the basic	concep	ts of Int	ellectu	al prope	erty, lav	vs		PO ₆ , P	
CO ₂			e about li								PO ₆ , P	
			al proper	0	8						-,	
CO ₃			the know	•	foonuri	abt act	and rig	hts of			PO ₆ , P	0.
	trader		LITE KIIOW	leuge of	соруга	giit act	anu ng				106,1	08
CO ₄			spects of	the IDD	Acts wi	th onco	studios	1			PO ₆ , P	<u></u>
PO ₁ - Engineerin									t of su	lutions		
PO12- Life-long L		9-111	dividual or	team wo				neer and n, PO 11- F				nd finance,
	earning	Map	oing of co	ourse ou	tcomes	· Commu with p	unication	n, PO 11- F	Project n	nanagen	nent ar	nd finance,
Course			oing of co		ork, PO 10-	Commu	unication	n, PO 11- I	Project n			nd finance,
Course Outcomes	earning	Map	oing of co	ourse ou	tcomes	· Commu with pr PO ₆	unication	n, PO 11- F outcon PO 8	Project n	nanagen	nent ar	nd finance,
Course Outcomes CO ₁	earning	Map	oing of co	ourse ou	tcomes	 Communication with program PO6 2 	unication	n, PO ₁₁ - F outcon PO ₈ 2	Project n	nanagen	nent ar	nd finance,
Course Outcomes CO ₁ CO ₂	earning	Map	oing of co	ourse ou	tcomes	vith pro-	unication	n, PO ₁₁ - F outcon PO ₈ 2 2	Project n	nanagen	nent ar	nd finance,
Course Outcomes CO ₁ CO ₂ CO ₃	earning	Map	oing of co	ourse ou	tcomes	 Communication with program PO6 2 	unication	n, PO ₁₁ - F outcon PO ₈ 2 2 2	Project n	nanagen	nent ar	nd finance,
Course Outcomes CO ₁ CO ₂	earning	Map	Ping of co PO ₃	PO4	PO ₅	Commu with pr PO ₆ 2 2 2 2 2 2	PO7	n, PO ₁₁ - F outcon PO ₈ 2 2 2 2 2	Project n	nanagen	nent ar	nd finance,
Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄	PO1	Map	Ping of co PO ₃	ourse ou	PO ₅	Commu with pr PO ₆ 2 2 2 2 2 2	PO7	n, PO ₁₁ - F outcon PO ₈ 2 2 2 2 2	Project n	nanagen	nent ar	nd finance,
Course Outcomes CO ₁ CO ₂ CO ₃	PO1	Mapj PC	PO3 PO3 1 - Reas	PO4 PO4	rk, PO ₁₀ - tcomes PO ₅ 2 - Sign	vith provide the second	rogram PO7 ; 3 – Str	PO ₈ 2 2 2 2 2 5 000g	Project n nes PO9	PO10	PO	nd finance, 11 PO ₁₂
Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄	PO1	Map PC	Ping of co PO3 1 - Reas	PO4 PO4 conable;	rk, PO ₁₀ - tcomes PO ₅ 2 - Sign	Vith provide the second	rogram PO7 ; 3 – Str	PO ₈ 2 2 2 2 2 2 7 0 ng	Project n nes PO ₉	PO ₁₀	PO	nd finance,
Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄	PO1	Map PC	Ping of co PO3 1 - Reas	OUTSE OU PO4 Conable; OF INT	rk, PO ₁₀ - tcomes PO5 2 - Sign ELLEC 7 right (1	Vith provide the second	rogram PO7 ; 3 – Str ROPER R in Indi	PO ₈ 2 2 2 2 2 2 7 0 ng	Project n nes PO ₉	PO ₁₀	PO	need for
Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄	PO1	Map PC	Ping of co PO3 PO3 1 - Reas ERVIEW Ellectual J oad Some	OUTSE OU PO4 Conable; OF INT Droperty e import	rk, PO ₁₀ - tcomes PO5 2 - Sign ELLEC 7 right (I tant exa	Vith provide the second	PO7 3 - Str ROPER R in Indi of IPR 5	PO ₁₁ - F outcon PO ₈ 2 2 2 2 2 0 ng TY intra a - Ger	Project n nes PO ₉ roducti nesis an	PO ₁₀ PO ₁₀ on and d Deve	PO	need for
Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conte	PO1	Mapj PC	Ping of co PO3 PO3 I - Reas ERVIEW Ellectual J oad Some TENTS: N	OF INT property e import Aeaning	rk, PO ₁₀ - tcomes PO5 2 - Sign ELLECT 7 right () tant exa ,Criteria	Vith provide the provident of the providence of the provide the providence of the provid	rogram PO7 ; 3 – Str PROPER & in Indi of IPR 5 btaining	a, PO ₁₁ - F outcon PO ₈ 2 2 2 2 2 3 7 7 7 7 9 7 7 9 7 9 7 9 7 9 7 9 7 9 7	Project n nes PO ₉ PO ₉ roducti nesis an	PO ₁₀ PO ₁₀ on and d Deve	PO PO the lopmo	need for ent IPR in
Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conte	PO1	Mapj PC	Ping of co PO3 PO3 I - Reas ERVIEW ERVIEW Ellectual j oad Som TENTS: M ity Non	PO4 PO4 conable; OF INT property e import Aeaning patental	rk, PO ₁₀ - tcomes PO5 2 - Sign ELLECT 7 right (l tant exa ,Criteria ble inve	Vith provide the provided state of the provi	rogram PO7 ; 3 – Str ROPER & in Indi of IPR 5 btaining Proced	a, PO ₁₁ - F outcon PO ₈ 2 2 2 2 ong TY intr a – Ger g pater ure for	Project n nes PO9 PO9 roducti nesis an ats No registr	PO ₁₀ PO ₁₀ on and d Devely 1 ation ,	PO PO the lopmo	need for ent IPR in ive step.
Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conte	PO1	Map PC OV into abr PA' Uti , Ri of p	Ping of co PO3 PO3 I - Reas ERVIEW Ellectual J oad Som TENTS: M ity Non ghts of pa patent In	PO4 PO4 Conable; OF INT property e import Aeaning patental atentee. fringem	rk, PO ₁₀ - tcomes PO ₅ PO ₅ 2 - Sign ELLECT right (l tant exa criteria ble inve Basic co ent of p	Vith provide the second	PO7 PO7 PO7 3 - Str ROPER R in Indi of IPR 5 btaining Proced of Comp and ren	PO ₈ PO ₈ 2 2 2 2 2 2 7 7 7 7 9 7 7 9 7 7 9 7 9 7	Project n nes PO9 PO9 roducti nesis an ats No registr license n case	PO10 PO10 on and d Devely 1 ation , f e and G of infri	PO PO the lopmo nvent rerm overn ngem	need for ent IPR in ive step. of patent ment use ent
Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conte	PO1	Map PC PC OV into abr PA' Uti , Ri of J CO	Ping of co PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3	OF INT patental atentee. fringem ': What i	rk, PO ₁₀ - tcomes PO ₅ 2 - Sign ELLECT 7 right (I tant exa ,Criteria ble inve Basic co ent of p s copyr	Vith privile a for o ntions. Soncept statents ight, Communication of the second statents of the second statent statents of the second statent statent statent statent statent statent statents of the second s	ROPER rogram PO 7 ; 3 – Str ROPER in Indi of IPR 5 btaining Proced of Comj and ren opyright	PO ₈ PO ₈ 2 2 2 2 2 2 7 7 7 7 7 7 9 7 7 9 7 7 9 7 7 9 7 7 9 7 7 9 7 7 9 7 7 9 7 9 7 7 9 7 7 7 7 9 9 7 9	Project n nes PO9 PO9 PO9 Coducti nesis an ats No registr license n case /hat is o	PO10 PO10 on and d Devel velty 1 ation , ' e and G of infri covered	PO PO the lopmo formovern ngem l by co	need for ent IPR in ive step. of patent ment use ent opyright?
Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conte	PO1	Map PC PC OV inte abr PA' Uti , Ri of I CO Ho	POINT OF CONTRACT	OF INT patental deaning patental deantee. fringem Y: What i des copy	rk, PO ₁₀ - tcomes PO ₅ 2 - Sign ELLEC right (I tant exa ,Criteria ble inve Basic co ent of p s copyr right las	Vith provide the second	ROPER rogram rogram PO7 ; 3 – Str ROPER an Indi of IPR 5 btaining Proced of Comp and ren opyright protect	PO ₁₁ - F outcom PO ₈ 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Project n nes PO ₉ PO ₉ roducti nesis an registr license n case rhat is o ght? RI	PO ₁₀ PO ₁₀ on and d Devely ation , ' e and G of infri covered ELATEI	PO PO the lopmo formovern ngem l by co P RIGH	need for ent IPR in ive step. of patent ment use ent pyright?
Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conte	PO1	Mapy PC PC Nov interation abr PA' Uti , Ri of J CO Ho are	Ping of co PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3	PO4 PO4 PO4 Conable; COF INT Droperty e import Aeaning patental atentee. fringem ': What i es copy rights? I	rk, PO ₁₀ - tcomes PO ₅ PO ₅ 2 - Sign ELLEC 7 right (I tant exa ,Criteria ble inve Basic co ent of p is copyr right las Distinct	Vith provide the second	ROPER rogram rogram PO7 ; 3 – Str ROPER an Indi of IPR 5 btaining Proced of Comp and ren opyright protect	PO ₁₁ - F outcom PO ₈ 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Project n nes PO ₉ PO ₉ roducti nesis an registr license n case rhat is o ght? RI	PO ₁₀ PO ₁₀ on and d Devely ation , ' e and G of infri covered ELATEI	PO PO the lopmo formovern ngem l by co P RIGH	need for ent IPR in ive step. of patent ment use ent opyright?
Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conte	PO1	Map PC PC Nov interation abr PA' Uti , Ri of J CO Ho are cov	Ping of co PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3	OF INT oroperty e import Aeaning patental atentee. fringem ': What i es copyrights? I	rk, PO ₁₀ - tcomes PO ₅ PO ₅ 2 - Sign ELLECT 7 right (l tant exa ,Criteria ble inve Basic cc ent of p is copyr right las Distinct t?	Vith provide the second	ROPER 3 - Str PROPER 3 in Indi of IPR 5 btaining Proced of Comp and ren pyright protect ween r	n, POn- F outcom POs 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Project n nes PO9 PO9 PO9 PO9 PO9 PO9 PO9 PO9 PO9 PO9	PO ₁₀ PO ₁₀ on and d Devel ovelty 1 ation , e and G of infri covered ELATEI and coj	PO PO PO the lopmo form overn ngem l by co o RIGH overight	need for ent IPR in ive step. of patent ment use ent opyright? ITS What t? Rights
Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conte	PO1	Map PC PC OV inte abr PA' Uti , Ri of J CO Ho are cov TR	Ping of co PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3	OF INT oroperty e import Aeaning patental atentee. fringem c: What i ess copyrigh S: What	rk, PO ₁₀ - tcomes PO ₅ PO ₅ 2 - Sign ELLECT 7 right () tant exa ,Criteria ble inve Basic co ent of p is copyr right las Distinct t? t is a tra	Vith provide the second	PROPER ROPER ROPER R in Indi of IPR 5 btaining Proced of Comj and ren pyright protect ween r k? Righ	n, POn- F outcom POs 2 2 2 2 2 2 3 7 7 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Project n nes PO9 PO9 PO9 PO9 PO9 PO9 PO9 PO9 PO9 PO9	PO ₁₀ PO ₁₀ on and d Devely ation , e and G of infri covered ELATEI and coj	PO PO PO the lopmo ferm overn ngem l by co o RIGH oyrigh	need for ent IPR in ive step. of patent ment use ent opyright? ITS What t? Rights I of signs
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Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conte	PO1	Map PC PC OV into abr PA' Uti , Ri of J CO Ho are cov TR car per lon	Pring of co PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3 PO3	PO4 PO4 PO4 conable; OF INT oroperty e import Meaning patental atentee. fringem ? What i es copyrights? I copyrights? I copyrigh	rk, PO ₁₀ - tcomes PO ₅ PO ₅ 2 - Sign ELLECT 7 right (I tant exa , Criteria ble inve Basic co ent of p is copyr right las Distinct tt? t is a tra lemarks ademar traden	Vith provide the second	PO7 PO7 PO7 PO7 ROPER ROP	a, PO ₁₁ - F outcon PO ₈ 2 2 2 2 2 2 3 7 7 7 7 9 7 9 9 7 9 7 9 7 9 7 9 9 7 9 9 7 9 7 9 9 7 9	Project n nes PO9 PO9 PO9 PO9 PO9 PO9 PO9 PO9 PO9 PO9	PO10 PO10 on and d Devel ovelty 1 ation , e and G of infri covered ELATEI and cop	PO PO PO PO PO PO PO PO PO PO PO PO PO P	need for ent IPR in ive step. of patent ment use ent opyright? ITS What t? Rights d of signs rademark ed? How rademark
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Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conte	PO1	Mapy PC	Present of particular Present of particular	PO4 PO4 PO4 PO4 Conable; Conab	rk, PO ₁₀ - tcomes PO ₅ PO ₅ 2 - Sign 2	Vith provide the second	ROPER s of tra cted? H otected marks a demark	POn- F outcom POs 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Project n nes PO9 PO9 PO9 PO9 PO9 PO9 PO9 PO9 PO9 PO9	PO ₁₀ PO ₁₀ on and d Develue ation , i e and G of infri covered ELATEI and cop k? What ion doe mark re- ktensiv	PO PO PO PO PO I the lopmo Term overn ngem I by co P RIGH by righ at kindes a tri- egister e is tri ected	need for ent IPR in ive step. of patent ment use ent pyright? ITS What t? Rights d of signs rademark red? How rademark ? Domain
Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conte	PO1	Map PC PC OV inte abr PA Uti , Ri of J CO Ho are cov TR car per lon prc nar GE	Present of particular Present of particular	PO4 PO4 PO4 PO4 PO4 PO4 PO4 PO5 POF INT property e import Aeaning patental atentee. fringem ? What i es copyrigh CS: What i as trac w is a tra gistered What ar pw does ICAL IN	rk, PO ₁₀ - tcomes PO 5 PO 5 2 - Sign 2 - Sign ELLECT 7 right (I tant exa ,Criteria ble inve Basic co ent of p s copyr right las Distinct t? t is a tra lemarks ademar tradem e well-H it relate DICATIO	Vith priving a constraint of the procession of t	rogram PO7 PO7 ; 3 – Str ROPER and ren pyright proced of Comp and ren pyright protect ween r k? Righ s of tra cted? H otected marks a demark /hat is a	A, POn- F outcom POs 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Project n nes PO9 PO9 PO9 PO9 PO9 PO9 PO9 PO9 PO9 PO9	PO ₁₀ PO ₁₀ on and d Devel ation , e and G of infri coverece ELATEL and cop k? What ion doe mark re- ktensiv ey prot	PO PO PO PO PO I the lopmo form overn ngemo l by co D RIGH by right at kind es a tu gister e is tr ected tion?	need for ent IPR in ive step. of patent ment use ent opyright? ITS What t? Rights d of signs rademark ed? How rademark ? Domain How is a

		INDUSTRIAL DESIGNS:What is an industrial design? How can industrial
		designs be protected? What kind of protection is provided by industrial
		designs? How long does the protection last? Why protect industrial designs?
	TT •/ 4	ENFORCEMENT OF INTELLECTUAL PROPERTY RIGHTS Infringement of
	Unit: 4	intellectual property rights Enforcement Measures EMERGING ISSUES
		INTELLECTUAL PROPERTY Overview of Biotechnology and Intellectual
	Unit: 5	Property, Biotechnology Research and Intellectual Property Rights
		Management Licensing and Enforcing Intellectual Property
Exa	mination and Evaluat	ion Pattern: It include both internal evaluation (30 marks) comprising two class
sess	ional exams/ assignm	ents/ quiz/ seminar presentation etc. and external evaluation (70 marks) which
is m	ainly end semester ex	amination.
Text	t Books:	
1	T. M Murray and M.J	. Mehlman,Encyclopedia of Ethical, Legal and Policy issues in Biotechnology,
	John Wiley & Sons 2	000
2	Lionel Bently & Brad	Sherman, Intellectual Property Law, Oxford. P. Narayanan, Intellectual
	Property Law, Easter	rn Law House
Refe	erence Books:	
1	Intellectual property	right, Deborah. E. Bouchoux, Cengage learning.
2	Intellectual property	right – Unleashing the knowledge economy, prabuddha ganguli, Tate McGraw
	Hill Publishing comp	any ltd.

Course Code		Course Title Lectu								ecture	ure		0	
UGCS712GET		History of Science L								Т	P		nester:	
Version: 1.2		Date of Approval: 16th Bo					11-2022	2	3	0	0		VII	
S	cheme of	f Instru	ction					Scher	ne of E	kamina	tion			
No. of	Periods	: 45	Hrs.					Ma	ximum	Score		:	100	
Periods	/ Week	: 3						Interr	nal Eval	uation		:	30	
	Credits	: 3]	End Sei	nester		:	70	
Instructio	n Mode	: Leo	ture					E	xam Du	iration		:	3 Hrs.	
Prerequisite(s): 1	vo specif	ic pre-r	equisit	es.										
Course Objective	es:													
Course Outcome	s (CO):													
COs No.	5 (00).			St	atemen	nt				М	Mapped Program			
													(POs)	
CO ₁													<u> </u>	
CO ₂														
CO ₃														
CO ₄														
sustainability, PO8-	Etnics, PC	J ₉ - Indiv	idual or 1	team wo	чк, PU 10 ⁻	- Comm	unicatic	лі, гО 11	- Projec	t manage	men	ic unio	manee	
PO ₁₂ - Life-long Lea	rning								5	t manage			manee	
	rning	Mappin PO ₂							5	PO ₁₀		O ₁₁	PO ₁₂	
PO ₁₂ - Life-long Lea	rning	Mappin	g of co	urse ou	tcomes	with p	rogran	n outco PO	omes					
PO ₁₂ - Life-long Lea Course Outcomes	rning	Mappin	g of co	urse ou	tcomes	with p	rogran	n outco PO	omes					
PO ₁₂ - Life-long Lea Course Outcomes CO ₁	rning	Mappin	g of co	urse ou	tcomes	with p	rogran	n outco PO	omes					
PO ₁₂ - Life-long Lea Course Outcomes CO ₁ CO ₂	rning	Mappin PO ₂	PO ₃	PO ₄	PO ₅	PO ₆	PO7	PO 8	omes					
PO ₁₂ - Life-long Lea Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄	PO ₁	Mappin PO ₂	PO ₃	PO ₄	tcomes	PO ₆	PO7	PO 8	omes					
PO ₁₂ - Life-long Lea Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conten	PO ₁	Mappin PO ₂	PO ₃	PO ₄	PO ₅	PO ₆	PO7	PO 8	omes					
PO ₁₂ - Life-long Lea Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Contem Unit: 1	PO ₁	Mappin PO ₂	PO ₃	PO ₄	PO ₅	PO ₆	PO7	PO 8	omes					
PO ₁₂ - Life-long Lea Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Contem Unit: 1 Unit: 2	PO ₁	Mappin PO ₂	PO ₃	PO ₄	PO ₅	PO ₆	PO7	PO 8	omes					
PO12- Life-long Lea Course Outcomes CO1 CO2 CO3 CO4 Detailed Conten Unit: 1 Unit: 2 Unit: 3	PO ₁	Mappin PO ₂	PO ₃	PO ₄	PO ₅	PO ₆	PO7	PO 8	omes					
PO12- Life-long Lea Course Outcomes CO1 CO2 CO3 CO4 Detailed Contem Unit: 1 Unit: 2 Unit: 3 Unit: 4	PO ₁	Mappin PO ₂	PO ₃	PO ₄	PO ₅	PO ₆	PO7	PO 8	omes					
PO12- Life-long Lea Course Outcomes CO1 CO2 CO3 CO4 Detailed Conten Unit: 1 Unit: 2 Unit: 3 Unit: 4 Unit: 5	rning PO ₁ ts:	Mappin PO2 1	g of con PO ₃ - Reaso	urse ou PO₄	tcomes PO5 2 - Sign	with p PO ₆	rogram PO7	n outco PO 8	PO ₉	PO ₁₀	P	O ₁₁	PO ₁₂	
PO12- Life-long Lea Course Outcomes CO1 CO2 CO3 CO4 Detailed Conten Unit: 1 Unit: 2 Unit: 3 Unit: 3 Unit: 4 Unit: 5 Examination and	rning PO ₁ ts:	Mappin PO ₂	g of cor PO ₃ - Reasc	urse ou PO₄ onable; :	tcomes PO₅ 2 - Sign	with p PO ₆	rogran PO7 ; 3 – St	n outco PO 8 crong	PO ₉	PO ₁₀	P	O ₁₁	PO ₁₂	
PO ₁₂ - Life-long Lea Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Contem Unit: 1 Unit: 2 Unit: 3 Unit: 4 Unit: 5 Examination and sessional exams/	rning PO ₁ ts:	Mappin PO ₂	g of com PO ₃ - Reaso	urse ou PO₄ onable; :	tcomes PO₅ 2 - Sign	with p PO ₆	rogran PO7 ; 3 – St	n outco PO 8 crong	PO ₉	PO ₁₀	P	O ₁₁	PO ₁₂	
PO12- Life-long Lea Course Outcomes CO1 CO2 CO3 CO4 Detailed Contem Unit: 1 Unit: 2 Unit: 3 Unit: 4 Unit: 5 Examination and sessional exams/ is mainly end sen	rning PO ₁ ts:	Mappin PO ₂	g of com PO ₃ - Reaso	urse ou PO₄ onable; :	tcomes PO₅ 2 - Sign	with p PO ₆	rogran PO7 ; 3 – St	n outco PO 8 crong	PO ₉	PO ₁₀	P	O ₁₁	PO ₁₂	
PO12- Life-long Lea Course Outcomes CO1 CO2 CO3 CO4 Detailed Conten Unit: 1 Unit: 2 Unit: 3 Unit: 4 Unit: 5 Examination and sessional exams/ is mainly end sen Text Books:	rning PO ₁ ts:	Mappin PO ₂	g of com PO ₃ - Reaso	urse ou PO₄ onable; :	tcomes PO₅ 2 - Sign	with p PO ₆	rogran PO7 ; 3 – St	n outco PO 8 crong	PO ₉	PO ₁₀	P	O ₁₁	PO ₁₂	
PO12- Life-long Lea Course Outcomes CO1 CO2 CO3 CO4 Detailed Conten Unit: 1 Unit: 2 Unit: 3 Unit: 4 Unit: 5 Examination and sessional exams/ is mainly end sen Text Books: 1	rning PO ₁ ts:	Mappin PO ₂	g of com PO ₃ - Reaso	urse ou PO₄ onable; :	tcomes PO₅ 2 - Sign	with p PO ₆	rogran PO7 ; 3 – St	n outco PO 8 crong	PO ₉	PO ₁₀	P	O ₁₁	PO ₁₂	
PO12- Life-long Lea Course Outcomes CO1 CO2 CO3 CO4 Detailed Conten Unit: 1 Unit: 2 Unit: 3 Unit: 4 Unit: 5 Examination and sessional exams/ is mainly end sen Text Books: 1 2	PO1 FO1 FS: Evaluat assignments rester ex	Mappin PO ₂	g of com PO ₃ - Reaso	urse ou PO₄ onable; :	tcomes PO₅ 2 - Sign	with p PO ₆	rogran PO7 ; 3 – St	n outco PO 8 crong	PO ₉	PO ₁₀	P	O ₁₁	PO ₁₂	
PO12- Life-long Lea Course Outcomes CO1 CO2 CO3 CO4 Detailed Conten Unit: 1 Unit: 2 Unit: 3 Unit: 3 Unit: 4 Unit: 5 Examination and sessional exams/ is mainly end sen Text Books: 1	PO1 FO1 FS: Evaluat assignments rester ex	Mappin PO ₂	g of com PO ₃ - Reaso	urse ou PO₄ onable; :	tcomes PO₅ 2 - Sign	with p PO ₆	rogran PO7 ; 3 – St	n outco PO 8 crong	PO ₉	PO ₁₀	P	O ₁₁	PO ₁₂	

Course Co	de			Со	urse Ti	tle			Lec	ture	Som	octor
UGCS713GET		Values & Ethics L							Т Р		Semester: VII	
Version: 1.2		I	Date of	Approv	al: 16th	BoS 17-	-11-202	2	3	0 0		VII
Ş	Scheme of	Instru	ction				5	Scheme	of Exa	minatio	n	
No. of	Periods	: 45	Hrs.					М	aximun	n Score	:	100
Period	s/Week	: 3						Inter	luation	:	30	
	Credits	: 3							mester	:	70	
Instructio	on Mode	: Lec	ture			Exam Du				uration	:	3 Hrs.
Prerequisite(s):	No specifi			es.								
Course Objectiv		1	1									
1. To help stud		ndersta	nd valu	es.								
2. To introduc					5.							
3. To understa												
4. To facilitate							ladan M	lohan M	lalviya a	and Maha	atma (Gandhi.
Course Outcom									5			
COs No.				St	atemen	nt				Март	oed Pr	ogram
											comes	•
CO ₁	Able to	underst	and the	e impor	tance o	f values	s in real	life			PO ₆	()
	Demons							me			PO ₇ ,	
CO ₃	Analyze			-						1	PO ₂ , PO) °
CO4	Explore						/alviva	and M	ahatma		PO ₆ , PO	
004	Gandhi.	the vi	0101	1 0. 1010	iuun m	onan n	laiviya	und wi	unuunu		. 00, 1 (J 8
		Mappin	g of cou	urse ou	tcomes	with p	rogram	outcom	nes			
Course										PO ₁₀	PO ₁₁	PO ₁
Outcomes	PO ₁	Mappin PO 2	g of cou PO3	urse ou PO ₄	tcomes PO₅	PO ₆	rogram PO ₇	outcom PO ₈	PO ₉	PO ₁₀	PO ₁₁	PO ₁ 2
Outcomes CO ₁							PO ₇			PO ₁₀	PO ₁₁	
Outcomes CO ₁ CO ₂		PO ₂				PO ₆		PO ₈		PO ₁₀	PO ₁₁	
Outcomes CO1 CO2 CO3						PO ₆	PO ₇	PO ₈		PO ₁₀	PO ₁₁	
Outcomes CO1 CO2		PO ₂	PO ₃	PO ₄	PO ₅	PO ₆ 2 2 2	PO ₇	PO ₈		PO ₁₀	PO ₁₁	
Outcomes CO1 CO2 CO3 CO4	PO ₁	PO ₂	PO ₃	PO ₄		PO ₆ 2 2 2	PO ₇	PO ₈		PO ₁₀	PO ₁₁	
Outcomes CO1 CO2 CO3	PO ₁	PO ₂ 2 1	PO ₃	PO ₄	PO5 2 - Sign	PO ₆ 2 2 ificant	PO ₇ 2 ; 3 - St 1	PO ₈ 3 3 •••ng	PO ₉			2
Outcomes CO1 CO2 CO3 CO4	PO1 its: Definit values, Religio	PO2 2 1 cion and , Physic ous value	PO ₃ – Reaso d classical, Enves.	PO ₄	PO ₅	PO ₆ 2 2 ificant:	PO ₇ 2 ; 3 - Str xtrinsic s, Econ	PO ₈ 3 3 cong c values omic, S	PO ₉	ersal and	d Situ c, Mor	2 ational cal and
Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conten	PO1 its: Definit values, Religio Conce Good	PO2 2 1 ion and , Physic ous value pts rela	PO ₃ – Reaso d classical, Enves. ted to v	PO ₄	PO ₅ 2 – Sign n of va ental, Se Purusar	PO ₆ 2 2 ificant	PO ₇ 2 ; 3 – Str xtrinsic s, Econ	PO ₈ 3 3 rong e values omic, S ght, dut	PO ₉	ersal and Aesthetic	d Situ c, Mor ity, Lo	ational ral and
Outcomes CO1 CO2 CO3 CO4 Detailed Conten Unit: 1	PO ₁ tts: Definit values, Religio Conce Good Egoisn Kutum	PO2 2 1 ion and , Physic ous value pts rela n, Altru bakam	PO ₃ – Reaso d classical, Enves. ted to v aism a	PO ₄	PO ₅	PO ₆ 2 2 <i>ificant</i> lues: E ensuous tha, Vir sm. Th	PO ₇ 2 ; 3 – Str xtrinsic s, Econ rtue, Ria	PO ₈ 3 3 cong e values omic, S ght, dut	PO ₉	ersal and Aesthetic ce, Equal	d Situ c, Mor ity, Lo Vasu	ational ral and we and
Outcomes CO1 CO2 CO3 CO4 Detailed Conten Unit: 1 Unit: 2	PO1 Definit values, Religio Conce Good Egoisn Kutum The Pr change	PO2 2 1 cion and physic pus value pts rela n, Altru bakam oblem c es.	PO ₃ – Reaso d classical, Envest ted to v tism a of Suster	PO ₄	PO ₅ 2 - Sign a of va ental, Se Purusar iversalis	PO ₆ 2 2 ijficant; lues: E ensuous tha, Vir sm. Th in the p	PO7 2 ; 3 - Str ; 3 - Str ; 5 - Str ; 5 - Str ; 6 - Str ; 7 - Str	PO ₈ 3 3 ong c values omic, S ght, dut al of S of Socia	PO ₉ s, Unive Social, A y, justic Sarvoda	ersal and Aesthetic ce, Equal aya and cal and T	d Situ c, Mor ity, Lo Vasu 'echno	ational ral and we and udhaiva
Outcomes CO1 CO2 CO3 CO4 Detailed Conten Unit: 1 Unit: 2 Unit: 3	PO1 Definit values, Religio Conce Good Egoisn Kutum The Pr change The Pr	PO2 2 1 cion and physic pus value pts rela n, Altru bakam oblem c es.	PO ₃ – Reaso d classical, Enves. ted to v uism a of Suster of hiera	PO ₄	PO ₅ 2 – Sign n of va ntal, Se Purusar iversalis of value	PO ₆ 2 2 ijficant; lues: E ensuous tha, Vir sm. Th in the p	PO7 2 ; 3 - Str ; 3 - Str ; s, Econ rtue, Rig ne Idea process	PO ₈ 3 3 ong c values omic, S ght, dut al of S of Socia	PO ₉ s, Unive Social, A y, justic Sarvoda	ersal and Aesthetic ce, Equal	d Situ c, Mor ity, Lo Vasu 'echno	ational ral and we and udhaiva
Outcomes CO1 CO2 CO3 CO4 Detailed Conten Unit: 1 Unit: 2 Unit: 3 Unit: 4 Unit: 5 Examination an	PO1 ats: Definit values, Religio Conce Good Egoisn Kutum The Pr change The Pr Malviy d Evaluati	PO2 2 2 1 cion and , Physic ous value pts rela n, Altru bakam oblem c es. roblem c a and M ion Pati	PO ₃ – Reaso d classical, Enves. ted to v uism a of Suster of hiera lahatma tern: It	PO4 mable; 2 ification ironme values: 1 nd un nance c archy of a Gandh include	PO5 2 - Sign 2 - Sign	PO ₆ 2 2 <i>ifficant</i> lues: E ensuous tha, Vir sm. Th in the p and th	PO ₇ 2 ; 3 – Str ; 5 – Str ; 5 – Str ; 7 – Str ; 6 – Str ; 7 – St	PO ₈ 3 3 ong e values omic, S ght, dut al of S of Socia ice, The ion (30	PO ₉ s, Unive Social, A y, justic Sarvoda Il, Politi- e views marks)	ersal and Aesthetic ee, Equal ya and cal and T of Pt. N compris	d Situ c, Mor ity, Lo Vasu lechno ladan	ational ral and we and obgical Mohan
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Course Co	ode									eture		Semester:	
UGCS714GET		Economic Policies in India L								Т	Р		VII
Version: 1.2			Date of	Approv	val: 16th	BoS 17-	11-2022		3	0	0		V II
1	Scheme o	f Instru	ction				Sc	heme	of Exar	nina	tion		
No. o	f Periods	: 45	Hrs.					Μ	laximui	n Sc	core	:	100
Period	s/Week	: 3				Internal Eva					tion	:	30
	Credits	: 3								eme	ster	:	70
Instructi	on Mode	: Lecture Exam D							Duration		:	3 Hrs	
Prerequisite(s):	No specif	fic pre-r	equisit	es.									
Course Objectiv	ves:												
1. To understa													
2. To acquire			Econor	nic refo	orms sin	ice 1991.							
3. To learn gro													
4. To analyze		onomy v	with oth	ner coui	ntries.								
Course Outcom	es (CO):												
COs No.				St	atemen	ıt							ogram
										(Jutco		(POs)
CO ₁						ies in Inc						PO ₆	
CO ₂					mic refo	orms sine	ce 1991					PO ₆	
CO ₃	Demon										Р	O ₆ , PC)9
CO ₄ PO ₁ - Engineering						countries						PO_6	
				team wo	ork, PO 10-	Commur	nication, I	PO11- PI					finance
PO ₁₂ - Life-long Le				team wo	ork, PO 10-		nication, I	PO ₁₁ - Pi	oject m			t and	
PO ₁₂ - Life-long Le Course Outcomes				team wo	ork, PO 10-	Commur with pro PO 6	nication, I	PO11- PI	oject m	anag			
PO ₁₂ - Life-long Le Course Outcomes CO ₁	arning	Mappin	ig of co	team wo urse ou	tcomes	Commur with pro PO ₆ 2	ogram o	PO ₁₁ - Pr utcom PO	es	anag	emen	t and PO 1	ι ΡΟ
PO ₁₂ - Life-long Le Course Outcomes CO ₁ CO ₂	arning	Mappin	ig of co	team wo urse ou	tcomes	Commur with pro PO ₆ 2 2	ogram o	PO ₁₁ - Pr utcom PO	PO9	anag	emen	t and PO 1	ιΡΟ
PO ₁₂ - Life-long Le Course Outcomes CO ₁ CO ₂ CO ₃	arning	Mappin	ig of co	team wo urse ou	tcomes	Commun with pro PO ₆ 2 2 2	ogram o	PO ₁₁ - Pr utcom PO	es	anag	emen	t and PO 1	ιΡΟ
PO ₁₂ - Life-long Le Course Outcomes CO ₁ CO ₂	arning	Mappin PO2	PO ₃	team wo	rk, PO ₁₀ - tcomes PO ₅	with pro PO ₆ 2 2 2 2 2	pgram or PO7	PO ₁₁ - Pr utcom PO 8	PO9	anag	emen	t and PO 1	ι ΡΟ
PO ₁₂ - Life-long Le Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄	PO1	Mappin PO2	PO ₃	team wo	rk, PO ₁₀ - tcomes PO ₅	Commun with pro PO ₆ 2 2 2	pgram or PO7	PO ₁₁ - Pr utcom PO 8	PO9	anag	emen	t and PO 1	ιΡΟ
Outcomes CO1 CO2 CO3	PO1	Mappin PO2	PO3 PO3	rse ou PO4 pnable; 2	rk, PO ₁₀ - tcomes PO ₅ 2 - Sign	vith pro PO ₆ 2 2 2 2 2 ificant;	PO7 3 – Stron	PO ₁₁ - Pr utcom PO 8	PO9	P P	ono	PO1	1 PO 2
PO ₁₂ - Life-long Le Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄	PO1	Mappin PO2 1 Develo	g of com PO ₃ - Rease	rse ou PO4 pnable; 2	rk, PO ₁₀ - tcomes PO ₅ 2 - Sign	with pro PO ₆ 2 2 2 2 2	PO7 3 – Stron	PO ₁₁ - Pr utcom PO 8	PO9	P	ono	PO1	1 PO 2
PO ₁₂ - Life-long Le Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conter Unit: 1	PO1	Mappin PO2 1 Develo Evalua	g of con PO ₃ - Reaso opment ation.	team wo urse ou PO4 onable; :	rk, PO ₁₀ - tcomes PO ₅ 2 - Sign gies in 1	Commur with pro PO ₆ 2 2 2 2 ificant; 3 India: Pla	PO7 3 - Stron	PO ₁₁ - PI utcom PO 8 ng	PO9	P	ono	PO1	1 PO 2
PO ₁₂ - Life-long Le Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conter Unit: 1 Unit: 2	PO1	Mappin PO2 Develo Evalua Econo	g of con PO ₃ – Reaso opment ation. omic ref	team wo urse ou PO4 pnable; 2 Strateg	rk, PO ₁₀ - tcomes PO ₅ 2 - Sign gies in 1 ince 199	Commur with pro PO ₆ 2 2 2 2 ificant; 3 India: Pla	PO7 3 – Stron impact.	PO ₁₁ - PI utcom PO 8 ng n India	PO9	P	ono	PO1	1 PO 2
PO ₁₂ - Life-long Le Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conter Unit: 1 Unit: 2 Unit: 3	PO1	Mappin PO2 Develo Evalua Econo Econo	g of con PO ₃ – Reaso opment ation. omic ref omic De	team wo urse ou PO4 mable; : Strates	rk, PO ₁₀ - tcomes PO ₅ 2 - Sign gies in 1 ince 199 eent and	Commur with pro PO ₆ 2 2 2 2 ificant; 3 India: Pla I and its Growth	PO7 3 – Stron impact. Policies	PO ₁₁ - PI utcom PO 8 ng n India	PO9	P P tive	ono	PO1	1 PO 2
PO ₁₂ - Life-long Le Course Outcomes CO_1 CO_2 CO_3 CO_4 Detailed Conten Unit: 1 Unit: 2	PO1	Mappin PO2 Develo Evalua Econo Econo	g of con PO ₃ – Reaso opment ation. omic ref omic De ilture a	team wo urse ou PO4 onable; 2 Strate; forms si velopm nd Indu	rk, PO ₁₀ - tcomes PO ₅ 2 - Sign gies in 1 ince 199 eent and istrial So	Commun with pro PO ₆ 2 2 2 2 <i>ificant;</i> <i>ificant;</i> <i>ificant;</i> <i>ificant;</i>	PO7 PO7 3 - Stron anning in impact. Policies f the Ind	PO ₁₁ - PI utcom PO 8 	PO9 PO9 1	P tive	emen O ₁₀	PO1 1 rateg	ies and
PO ₁₂ - Life-long Le Course Outcomes CO ₁ CO ₂ CO ₃ CO ₄ Detailed Conter Unit: 1 Unit: 2 Unit: 3	PO1	Mappin PO2 PO2 I Develor Evalua Econo Agricu Curre	reg of com PO ₃ - Rease opment ation. omic ref omic De ilture a nt chall	velopm nd Indu enges f	rk, PO ₁₀ - tcomes PO ₅ 2 - Sign gies in 1 ince 199 ient and istrial Se facing Ir	Commun with pro PO ₆ 2 2 2 2 <i>ificant;</i> 1 and its 1 and its 1 Growth ectors of ndian Eco	PO7 PO7 3 - Stron anning in impact. Policies f the Ind	PO ₁₁ - PI utcom PO 8 	PO9 PO9 1	P tive	emen O ₁₀	PO1 1 rateg	ies and
PO12- Life-long Le Course Outcomes CO1 CO2 CO3 CO4 Detailed Conter Unit: 1 Unit: 2 Unit: 3 Unit: 4 Unit: 5	PO ₁ PO ₁ nts:	Mappin PO2 Develor Evalua Econo Agricu Curre a com	g of cor PO ₃ – Reaso opment ation. omic ref omic De alture a nt chall parison	team wo urse ou PO4 Domable; : Stratego corms si velopm nd Indu enges fo with o	rk, PO ₁₀ - tcomes PO ₅ 2 - Sign gies in 1 ince 199 ient and istrial Si acing Ir ther con	Commun with pro PO ₆ 2 2 2 2 <i>ificant;</i> 1 and its I Growth ectors of ndian Eco untries.	PO7 PO7 Banning in impact. Policies the Ind ponomy, I	PO ₁₁ - PI utcom PO 8 ng ng s. ian eco Develo	PO9 PO9 1 1 , Objec	exp	emen O ₁₀ s, Stı	rateg	ies and
PO12- Life-long Le Course Outcomes CO1 CO2 CO3 CO4 Detailed Conter Unit: 1 Unit: 2 Unit: 3 Unit: 4 Unit: 5 Examination an	PO1 PO1 nts:	Mappin PO2 Develo Evalua Econce Agricu Curre a com	g of cor PO ₃ – Reaso opment ation. omic ref omic De ilture at nt chall parison tern: It	team wo urse ou PO4 Date: Corms si velopm nd Indu enges f with o include	rk, PO ₁₀ - tcomes PO ₅ 2 - Sign gies in 1 ince 199 ent and istrial So acing Ir ther con both in	Commun with pro- PO ₆ 2 2 2 2 ificant; 3 india: Pla 1 and its 1 Growth ectors of ndian Eco untries. nternal e	PO7 PO7 3 - Stron impact. Policies the Ind onomy, I	PO11- PI utcom PO 8 n n n n n n n n (30 I	PO9 PO9 1 , Object	exp	emen O10 s, Str erien prisii	rategi	ies and
PO12- Life-long Le Course Outcomes CO1 CO2 CO3 CO4 Detailed Conter Unit: 1 Unit: 2 Unit: 3 Unit: 4 Unit: 5 Examination an sessional exams	PO1 PO1 nts: d Evaluat / assignn	Mappin PO2 Develo Evalua Econo Econo Agricu Curre a com ion Pat	g of com PO ₃ - Reason opmentation. omic ref omic De ilture an nt chall parison tern: It puiz/ se	team wo urse ou PO4 Date: Corms si velopm nd Indu enges f with o include	rk, PO ₁₀ - tcomes PO ₅ 2 - Sign gies in 1 ince 199 ent and istrial So acing Ir ther con both in	Commun with pro- PO ₆ 2 2 2 2 ificant; 3 india: Pla 1 and its 1 Growth ectors of ndian Eco untries. nternal e	PO7 PO7 3 - Stron impact. Policies the Ind onomy, I	PO11- PI utcom PO 8 n n n n n n n n (30 I	PO9 PO9 1 , Object	exp	emen O10 s, Str erien prisii	rategi	ies and
PO12- Life-long Le Course Outcomes CO1 CO2 CO3 CO4 Detailed Conter Unit: 1 Unit: 2 Unit: 3 Unit: 4 Unit: 5 Examination an sessional exams is mainly end se	PO1 PO1 nts: d Evaluat / assignn	Mappin PO2 Develo Evalua Econo Econo Agricu Curre a com ion Pat	g of com PO ₃ - Reason opmentation. omic ref omic De ilture an nt chall parison tern: It puiz/ se	team wo urse ou PO4 Date: Corms si velopm nd Indu enges f with o include	rk, PO ₁₀ - tcomes PO ₅ 2 - Sign gies in 1 ince 199 ent and istrial So acing Ir ther con both in	Commun with pro- PO ₆ 2 2 2 2 ificant; 3 india: Pla 1 and its 1 Growth ectors of ndian Eco untries. nternal e	PO7 PO7 3 - Stron impact. Policies the Ind onomy, I	PO11- PI utcom PO 8 n n n n n n n n (30 I	PO9 PO9 1 , Object	exp	emen O10 s, Str erien prisii	rategi	ies and
PO12- Life-long Le Course Outcomes CO1 CO2 CO3 CO4 Detailed Conter Unit: 1 Unit: 2 Unit: 3 Unit: 3 Unit: 5 Examination an sessional exams is mainly end se Text Books:	PO1 PO1 nts: d Evaluat / assignm mester ex	Mappin PO2 Develo Evalua Econo Econo Agricu Curre a com ion Pat nents/ o caminati	g of cor PO ₃ – Rease opment ation. omic ref omic De ilture a int chall parison tern: It juiz/ se ion.	team wo urse ou PO4 pnable; 2 corms si velopm nd Indu enges f with o include eminar p	rk, PO ₁₀ - tcomes PO ₅ 2 - Sign gies in l ince 199 ent and istrial Sc acing Ir ther core both in present.	Commun with pro- PO6 2 2 2 2 2 ificant; 2 ificant; 3 ificant; 3 ificant; 3 ificant; 3 if	PO7 PO7 3 - Stron anning in impact. Policies f the Ind ponomy, I valuatio	POn-Pr utcom PO 8 n n n n n n n n n n n n n n n n n n	PO9 PO9 1 a, Objec onomy. pment narks) a	exp com iion	emen O10 s, Str prisii (70 m	t and PO	ies and
PO12- Life-long Le Course Outcomes CO1 CO2 CO3 CO4 Detailed Conter Unit: 1 Unit: 2 Unit: 2 Unit: 3 Unit: 3 Unit: 5 Examination an sessional exams is mainly end se Text Books: 1 Karl E. Cas	arning PO1 nts: d Evaluat / assignm mester ex	Mappin PO2 Develo Evalua Econo Econo Agricu Curre a com ion Pat ents/ c aminati	g of cor PO ₃ – Reasc opment ation. omic ref omic De alture a nt chall parison tern: It quiz/ se ion.	PO4 PO4 PO4 mable; : Strates Corms si velopm nd Indu enges f a with o include eminar p obles of F	rk, PO ₁₀ - tcomes PO ₅ 2 - Sign gies in 1 ince 199 eent and istrial So facing Ir ther cor both in present	Commun with pro PO ₆ 2 2 2 2 ificant; 3 ificant; 3 ificant; 3 ificant; 3 ificant; 3 ificant; 4 ificant; 4 ifi	PO7 PO7 3 - Stron anning in impact. Policies the Ind ponomy, I valuatio and ex	PO11- P1 utcom PO 8 n n n n n n n n n n n n n n n n n n	PO9 PO9 1 1 a, Object onomy. pment narks) evaluat	exp com th E	emen O10 s, Str prisin (70 m ditio	t and PO, 1 rategi ace of ng tw parks)	i PO
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