



Jyothi Engineering College

NAC Accredited College with NBA Accredited Programmes*

Approved by AICTE & affiliated to APJ Abdul Kalam Technological University

A CENTRE OF EXCELLENCE IN SCIENCE & TECHNOLOGY BY THE CATHOLIC ARCHDIOCESE OF TRICHUR

JYOTHI HILLS, VETTIKATTIRI P.O, CHERUTHURUTHY, THRISSUR. PIN-679531 PH : +91- 4884-259000, 274423 FAX : 04884-274777



NBA accredited B.Tech Programmes in Computer Science & Engineering, Electronics & Communication Engineering, Electrical & Electronics Engineering and Mechanical Engineering valid for the academic years 2016-2022. NBA accredited B.Tech Programme in Civil Engineering valid for the academic years 2019-2022.

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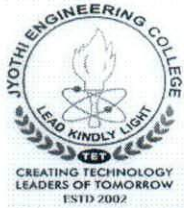
2.6.1 Teachers and students are aware of the stated Program and course outcomes of the Programmes offered by the institution. (15)

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Circulars and Minutes of Meetings for COs and PSOs Preparation

Advisory Meeting Minutes Department of Computer Science and Engineering

JYOTHI ENGINEERING COLLEGE, CHERUTHURUTHY, THRISSUR

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

MINUTES OF THE ADVISORY COMMITTEE MEETING

Date: 21/07/2017 Time: 2.00pm Venue: Board Room, JECC, Cheruthuruthy

The Advisory Committee Meeting for CSE Department was conducted on 21st July 2017 in the Board Room, JECC

AGENDA:

1. Welcoming the Advisory Committee members.
2. Finalising the PSO of the department.
3. Discussions on Departmental activities.
4. Promotion steps for industry- institute interaction.
5. Suggestions on certified MOOC courses.
6. Any other matters.

MEMBERS PRESENT:

1. Prof.M T Rajappan Pillai, (HOD,CSE)
2. Dr. K KBabu, Principal, JECC
3. Fr.Roy Joseph Vadakkan ,Asst,Manager(Academics), JECC
4. Dr. V. Kabeer, Head of the Department, Department of Computer Science, Farook College Calicut.
5. Dr.C.K Raju , Professor CSE Dept , JECC
6. Mr. Primal Vincent, System Manager, CTS, Kochin
7. Prof.Muralee Krishnan C, (Professor, CSE)
8. Ms. Jyothis T S, Asst. Professor, CSE Dept.

PROCEEDINGS:

1. Discussed the PSO Statement and finalized
2. Discussed about S8 results of CSE, placements and achievements of students.
3. Discussion were done about PEOs and POs and their attainments
4. HOD Pointed out that more important has to be given to the semester results
5. Mr.Primal Vincent pointed out that train the students according to the industry needs.
6. Dr.C K Raju Pointed out that motivate the students to do the social relevance project.



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7. Dr.Kabeer enquired about the open source projects of the students, he added that these type of projects add more values to the students.
8. Prof .MuraleeKrishnan pointed out more stress is to be given to R&D work









The meeting came to an end at 3.30 pm.

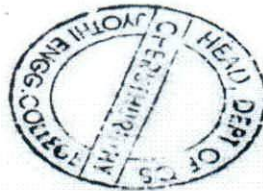
ACTION TAKEN:

1. The PSO Statement of the department approved in this meeting.
2. The department decided to interact with the industries by encouraging the students to undergo internship in the industries.

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Members present:

- | <u>Name</u> | <u>Signature</u> |
|-----------------------------|---|
| 1. Dr.K.KBabu |  |
| 2. Fr.Roy Joseph Vadakkan |  |
| 3. Prof.M T Rajappan Pillai |  |
| 4. Prof. Muralee Krishnan C |  |
| 5. Dr. V. Kabeer |  |
| 6. Dr. C K Raju |  |
| 7. Mr. Primal Vincent |  |
| 8. Ms.Jyothis T S |  |



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Assessment Committee Meeting Minutes Department of Computer Science and Engineering

JYOTHI ENGINEERING COLLEGE, CHERUTHURUTHY, THRISSUR

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

MINUTES OF THE ASSESSMENT COMMITTEE MEETING

Date: 30/01/2019

Time: 10.30 am Venue: HOD Room, CSE Dept.

AGENDA:

1. Discussion regarding funded projects.
2. Revision of PSO and CO in alignment with the POs, PEOs and Vision and Mission of the institute.
3. Evaluation of sessional mark and university results.
4. Discussion on departmental activities.
5. Discussion on action taken report on last assessment committee recommendations.
6. Other relevant matters such as
 1. Discussion on Gap and Content beyond Syllabus identified in the Alumni survey
 2. Add-on Courses
 3. NPTEL courses
 4. Coursera courses

MEMBERS PRESENT:

1. Fr. Dr. A K George, HOD, CSE
2. Dr. Vinith R, Associate Professor, CSE Dept.
3. Mr. Thomas George, Asst. Professor, CSE Dept.

DISCUSSIONS:

1. HOD congratulated the members on the achievement of KCSTE funds for the projects 'LYZA', 'SPEED LIMITOR' and 'CURRENCY RECOGNITION FOR BLINDS' under the guidance of Ms. Aswathy Wilson and Mr. Fepslin Athish Mon and also congratulated the 'LYZA' team for achieving AICTE best paper award.
2. PO, PSO and PEO statements were discussed in detail by the committee and concluded that the statements were well aligned to the higher level statements. The COs for the courses in the semester were all mapped to the POs and PSOs. The committee finally decided to continue with the existing statements as POs and PSOs as they were well in consonance with the course contents and the PEOs and Vision, Mission of the institute.



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ACTION TAKEN:

1. HOD convened a department meeting to impress upon the faculty the importance of outcome based education and processes set for achieving the objective the paradigm envisages to have. Short comings observed in the last semester and ways to address them were discussed in the meeting.
2. All aspects of the teaching learning process were refined in the spirit of outcome based education.
3. Question papers prepared for internal exams are to have CO, PO and Bloom's Taxonomy mappings to instil the spirit of the outcome based education in students and faculty alike.
4. Series question banks containing thrice the required number of questions were prepared, so that they can serve as a very good source of questions for the students while getting ready for the end semester exams. Series exam questions was selected by IQAC from the bank submitted by faculty.

Members present:

- | <u>Name</u> | <u>Signature</u> |
|-----------------------|------------------|
| 1. Fr. Dr. A K George | |
| 2. Dr. Vinith R | |
| 3. Mr. Thomas George | |

Signature



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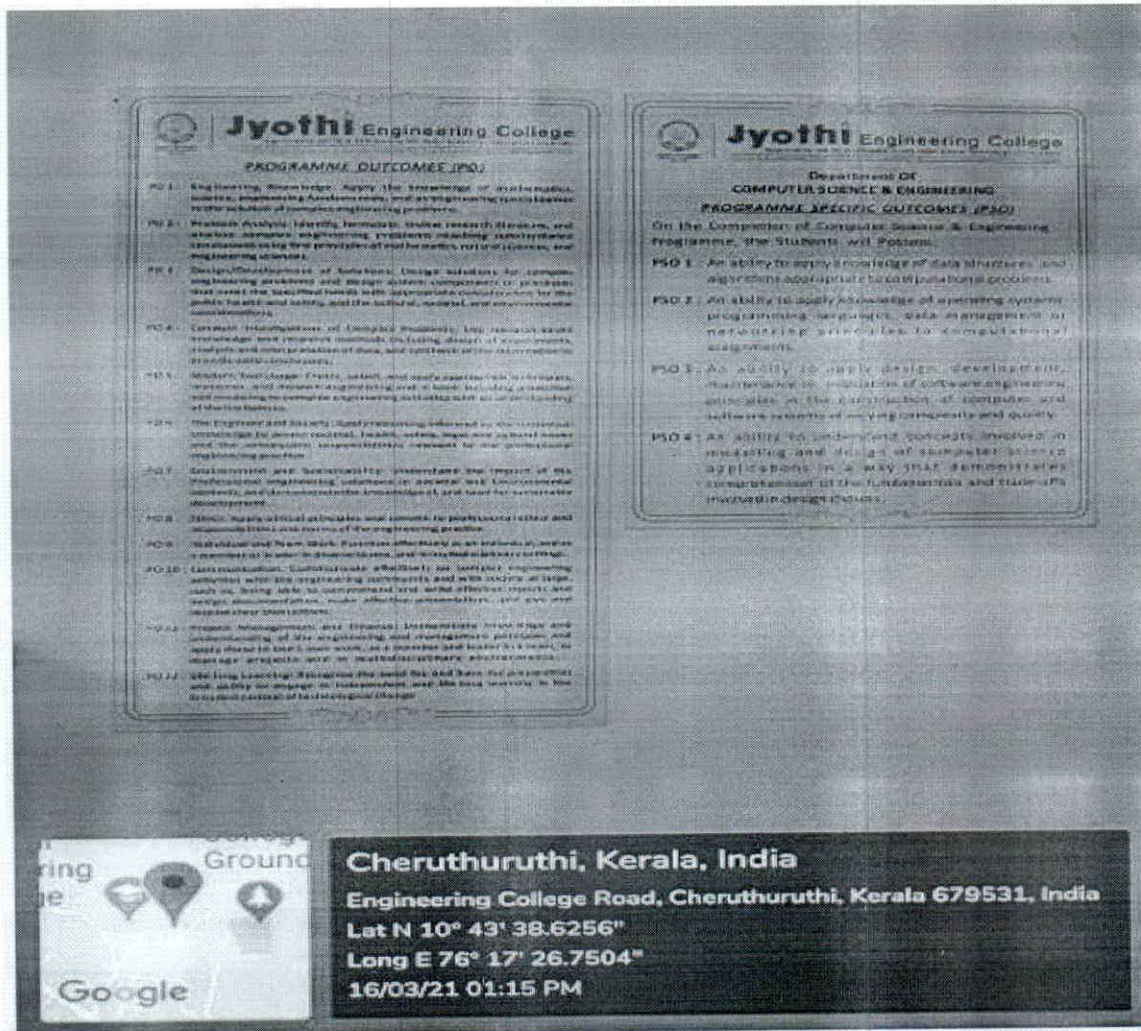


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Geo Tag Photos for display of POs and PSOs

Class room

Computer Science and Engineering Department



Power Electronics and Instrumentation Lab

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Electronics and Communication Engineering




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PROGRAMME OUTCOMES (PO)

- PO 1: **Engineering Knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- PO 2: **Problem Analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- PO 3: **Design/Development of Solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- PO 4: **Conduct Investigations of Complex Problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- PO 5: **Modern Tool Usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
- PO 6: **The Engineer and Society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
- PO 7: **Environment and Sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for, sustainable development.
- PO 8: **Ethics:** Apply ethical principles and control to professional ethics and responsibilities and norms of the engineering practice.
- PO 9: **Individual and Team Work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- PO 10: **Communication:** 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 presentations, and give and receive clear instructions.
- PO 11: **Project Management and Finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- PO 12: **Life-long Learning:** 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.



Jyothi Engineering College

CHERUTHURUTHY, TRICHUR

DEPARTMENT


ELECTRONICS & COMMUNICATION ENGINEERING

VISION

CREATE EMERENT AND ETHICAL LEADERS IN THE FIELD OF ELECTRONICS AND COMMUNICATION ENGINEERING THROUGH PROFESSIONAL EDUCATION TO EXCELLENCE.

MISSION

- PROVIDE THEORETICAL AND PRACTICAL QUALITY EDUCATION AND LIFE SKILLS TO THE STUDENTS.
- TO IMPART ENTREPRENEURIAL ORIENTATION TO THE STUDENTS.
- TO PROMOTE RESEARCH AMONG THE STUDENTS AND TO FACILITATE TRANSFER BETWEEN INDUSTRIAL AND ACADEMIC INSTITUTIONS.



Cheruthuruthi, Kerala, India

Engineering College Road, Cheruthuruthi, Kerala 679531, India

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Long E 76° 17' 27.1896"

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Cheruthuruthi, Kerala, India

Engineering College Road, Cheruthuruthi, Kerala 679531, India

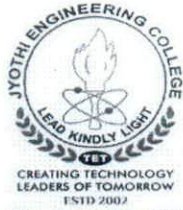
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Department Of
ELECTRONICS & COMMUNICATION ENGINEERING

PROGRAMME SPECIFIC OUTCOMES (PSO)

On the Completion of Electronics & Communication Engineering Programme, the Students will Possess:

- PSO 1 : Professional Skills:** Associate the concepts related to electronics, communication, embedded systems, signal processing and VLSI to solve real life problems.
- PSO 2 : Problem Solving Ability:** Comprehend technology advancement to analyze and design systems using modern design tools for the benefit of the society.
- PSO 3 : Lifelong Learning and Ethical Values:** Have good communication skill, work as a team, develop leadership qualities, become professionals or entrepreneurs with ethical values.

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Nigeria

Google

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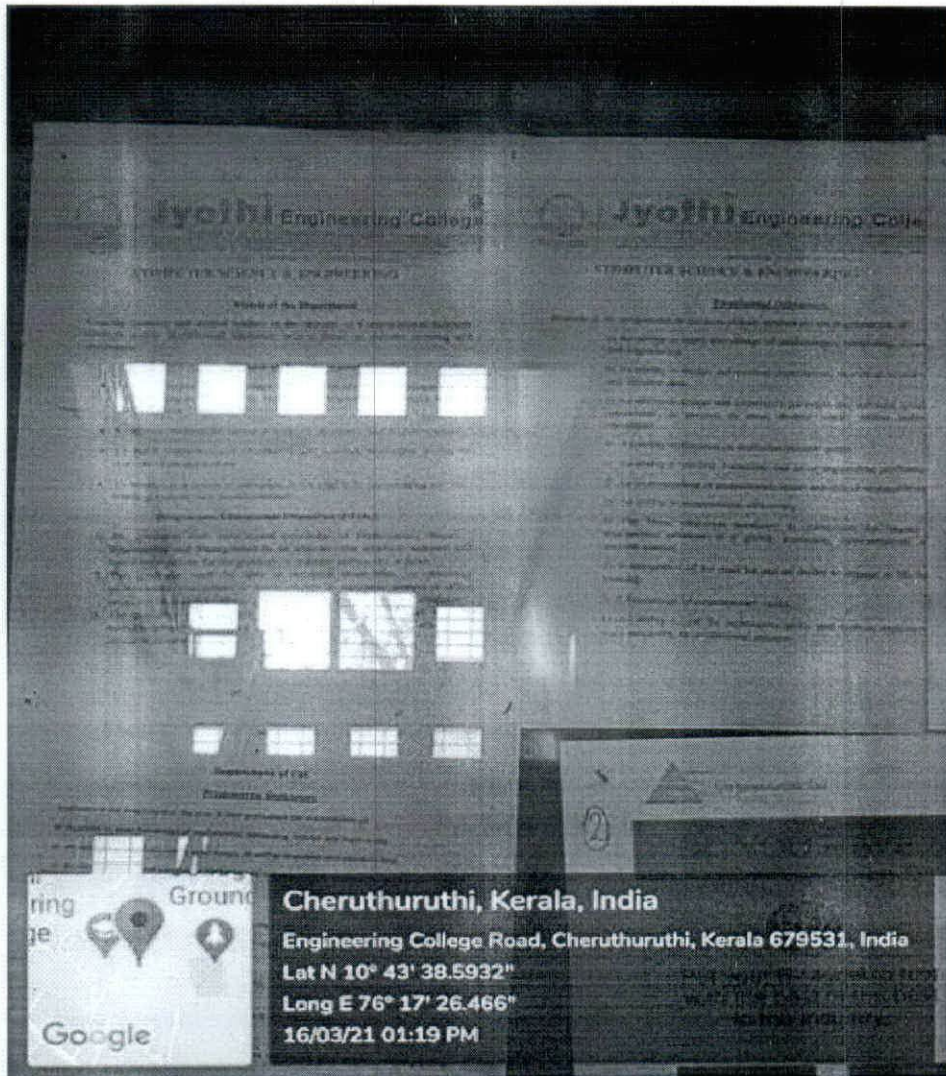
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Notice Board

Computer Science and Engineering Department



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COs, POs, PSOs IN COURSE INFORMATION SHEET

COURSE INFORMATION SHEET

PROGRAMME: Computer Science and Engineering(B)	DEGREE: B.TECH
COURSE: GRAPH THEORY AND COMBINATORICS	SEMESTER: S5 CREDITS: 4
COURSE CODE: CS309 REGULATION: KTU 2015	COURSE TYPE: Theory
COURSE AREA/DOMAIN: GraphTheory	CONTACT HOURS: 5
CORRESPONDING LAB COURSE CODE (IF ANY): -	LAB COURSE NAME: -

COURSE OBJECTIVES:

Sl.No	DESCRIPTION
1	To introduce the fundamental concepts in graph theory, including properties and characterization of graphs/trees
2	To familiarize Graphs theoretic algorithms

COURSE OUTCOMES:

Sl.No	DESCRIPTION	PO & PSO MAPPING
C305.1	Student is able to demonstrate the knowledge of fundamental concepts in graph theory, including properties and	PO1,PO2,PO3,PO4,PO5,PO12,PSO1,PSO2,PSO3,PSO4

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	characterization of graphs.	
C305.2	Student is able to use graphs for solving real life problems.	PO1,PO2,PO3,PO4,PO5,PO12,PSO1,PSO2,PSO3,PSO4
C305.3	Student is able to understand the properties and characterization of trees .	PO1,PO2,PO3,PO4,PO5,PO12,PSO1,PSO2,PSO3,PSO4
C305.4	Student is able to distinguish between planar and non-planar graphs and solve problems.	PO1,PO2,PO3,PO4,PO5,PO12,PSO1,PSO2,PSO3,PSO4
C305.5	Student is able to understand different matrix representation of graphs	PO1,PO2,PO3,PO4,PO5,PO12,PSO1,PSO2,PSO3,PSO4
C305.6	Student is able to develop efficient algorithms for graph related problems in different domains of engineering and science.	PO1,PO2,PO3,PO4,PO5,PO12,PSO1,PSO2,PSO3,PSO4

COURSE OUTCOMES VS PO MAPPING:

Sl.No	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C305.1	3	3	2	2	1	-	-	-	-	-	-	1
C305.2	3	3	3	3	1	-	-	-	-	-	-	1
C305.3	3	3	2	2	1	-	-	-	-	-	-	1
C305.4	3	3	3	2	1	-	-	-	-	-	-	1
C305.5	3	3	2	1	1	-	-	-	-	-	-	1
C305.6	3	3	3	2	1	-	-	-	-	-	-	1

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Avg	3	3	2.5	2	1	-	-	-	-	-	-	1
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COURSE OUTCOMES VS PSO MAPPING:

Sl.No	PSO1	PSO2	PSO3	PSO4
C305.1	3	1	2	3
C305.2	3	1	2	3
C305.3	3	1	2	3
C305.4	3	1	2	3
C305.5	3	1	2	3
C305.6	3	1	2	3
Avg	3	1	2	3

JUSTIFICATION FOR MAPPING:

Sl.No	PO & PSO MAPPED	JUSTIFICATION
C305.1	PO1, PO2, PO3, PO4, PO5, PO12, , PSO1, PSO2, PSO3, PSO4,	Fundamental concepts in graph theory, will help to gain engineering knowledge that can be used to analyze the problems and design solutions. It will help in life long learning and designing solutions for real life problems in the computer science field.
C305.2	PO1, PO2, PO3, PO4, PO5, PO12, , PSO1, PSO2, PSO3, PSO4,	Can use graphs for solving real life problems will help to gain engineering knowledge that can be used to analyze the problems and design solutions. It will help in life long learning and designing solutions for real life problems in the computer science field.
C305.3	PO1, PO2, PO3, PO4, PO5, PO12,	By knowing properties and characterization of trees

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	, PSO1, PSO2, PSO3, PSO4,	that knowledge can be applied in analyzing and solving problems and designing new software ware products
C305.4	PO1, PO2, PO3, PO4, PO5, PO12, , PSO1, PSO2, PSO3, PSO4,	The knowledge of planar and non-planar graphs can be used to solve problems in computer networks
C305.5	PO1, PO2, PO3, PO4, PO5, PO12, , PSO1, PSO2, PSO3, PSO4,	Different matrix representation of graphs will helps to represent the real situations in a computer accessing manner
C305.6	PO1, PO2, PO3, PO4, PO5, PO12, , PSO1, PSO2, PSO3, PSO4,	Can generate efficient algorithms for graph related problems in the real life senario


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Ph.D (Computer Science), Ph.D (Maths)
PRINCIPAL
Jyothi Engineering College
Cheruthuruthy P.O.- 679 531



Jyothi Engineering College

NAAAC Accredited College with NBA Accredited Programmes*

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PROJECT DIARY WITH POS

REAL TIME AUTOMATED CCTV VIDEO SURVEILLANCE SYSTEM

PROJECT REPORT

Submitted by

RIYA ROY PALAMATTAM (JEC15CS064)

SREENATH M (JEC15CS072)

SURYA R (JEC15CS075)

to

The APJ Abdul Kalam Technological University

*in partial fulfillment of the requirements for the award of the Degree
of*

BACHELOR OF TECHNOLOGY (B.Tech)

in

COMPUTER SCIENCE & ENGINEERING

Under the guidance of

Mr. UNNIKRISHNAN P



CREATING TECHNOLOGY
LEADERS OF TOMORROW
ESTD 2002

MAY 2019

Department of Computer Science & Engineering

JYOTHI ENGINEERING COLLEGE, CHERUTHURUTHY

14

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DEPARTMENT VISION

Creating eminent and ethical leaders in the domain of computational sciences through quality professional education with a focus on holistic learning and excellence.

DEPARTMENT MISSION

- To create technically competent and ethically conscious graduates in the field of Computer Science & Engineering by encouraging holistic learning and excellence.
- To prepare students for careers in Industry, Academia and the Government.
- To instill Entrepreneurial Orientation and research motivation among the students of the department.
- To emerge as a leader in education in the region by encouraging teaching, learning, industry and societal connect.

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PROGRAMME OUTCOMES (POs)

1. Ability to apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. Ability to identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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4. Ability to use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
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6. Ability to apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
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COURSE OUTCOMES (COs)

- CS415.1 The students will be able to analyse a current topic of professional interest and present it before an audience.
- CS415.2 Students will be able to identify an engineering problem, analyse it and propose a work plan to solve it.
- CS415.3 Students will have gained thorough knowledge in design, implementations and execution of Computer science related projects.
- CS415.4 Students will have attained the practical knowledge of what they learned in theory subjects.
- CS415.5 Students will become familiar with usage of modern tools.
- CS415.6 Students will have ability to plan and work in a team.

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PO - CO Mapping

Course Outcome									
Programme Outcomes	Sl.no	CS415.1	CS415.2	CS415.3	CS415.4	CS415.5	CS415.6	Avg	
	1	3	3	3	3	3	3	3	3
	2	3	3	3	3	3	3	3	3
	3	3	3	3	3	3	3	3	3
	4	3	3	3	3	3	3	3	3
	5	3	3	3	3	3	3	3	3
	6	2	2	2	2	2	2	2	2
	7	3	3	3	3	3	3	3	3
	8	3	3	3	3	3	3	3	3
	9	3	3	3	3	3	3	3	3
	10	3	3	3	3	3	3	3	3
	11	2	2	2	2	2	2	2	2
	12	3	3	3	3	3	3	3	3

PSO - CO Mapping

Course Outcome									
Programme Specific Outcomes	SLNo.	CS415.1	CS415.2	CS415.3	CS415.4	CS415.5	CS415.6	Avg	
	1	3	3	3	3	3	3	3	3
	2	3	3	3	3	3	3	3	3
	3	3	3	3	3	3	3	3	3
	4	2	2	2	2	2	2	2	2

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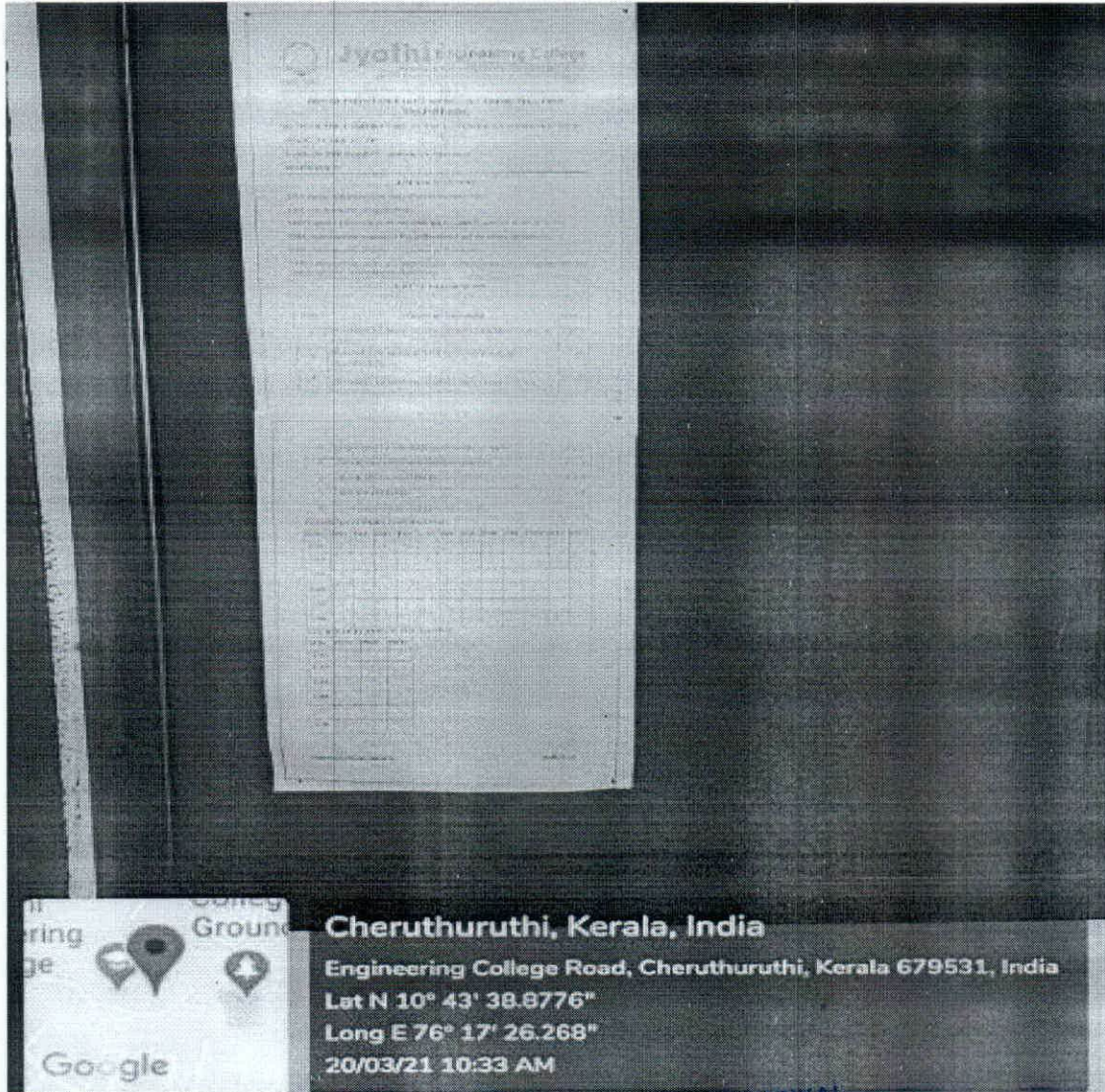


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COURSE OUTCOMES DISPLAY IN LAB NOTICE BOARD

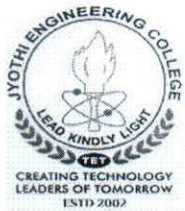
Power Electronics and Instrumentation Lab

Electronics and Communication Engineering



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COURSE OUTCOMES IN IA QUESTION PAPER

QP CODE (A)

Roll No:.....

Jyothi Engineering College, Cheruthuruthy
SECOND SESSIONAL EXAMINATION

Semester S5, October 2020

(Department of Computer Science and Engineering)
CS309:Graph Theory and Combinatorics
(KTU Scheme)

Time: 60 minutes

Max Marks:40

INSTRUCTIONS

- There are three sections in the question paper representing three modules
- There are two questions of 10 marks each in each section
- A total of four questions are to be answered out of the five questions given, but at least one question should be answered from each section.
- After the completion of examination the answer sheets should be uploaded in the google classroom within the stipulated time (09:30 am – 09:40 am). In case of network issues, submission can be done through whatsapp as per the directions from the teachers.

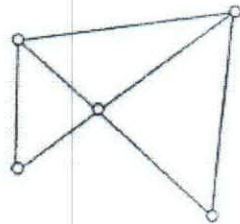
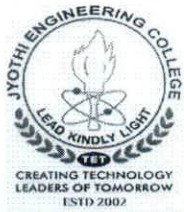
PART A

1. a) Differentiate between complete symmetric and complete asymmetric graph with an example each.
b) State Dirac's Theorem and check its applicability in the following graph, G

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(CO2)(BTL3) 10

2. A connected graph G is an Euler graph if and only if all vertices of G are of even degree. Prove the statement

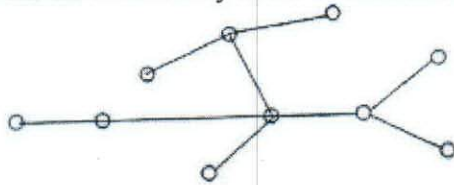
(CO2)(BTL4) 10

PART B

3. a) Define the following terminologies:

- Eccentricity
- Center
- Radius and diameter

- b) Find the eccentricity of all vertices and also mark the center

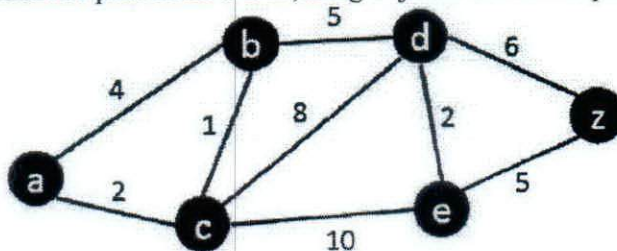


10

(CO3)(BTL4)

PART C

4. Find shortest path from a to z , using Dijkstra's shortest path algorithm



10

(CO-6)(BTL-2,3)

5. Discuss an algorithm to find the minimum spanning tree of a graph G with example.

(CO-5)(BTL-1,2,3)

10

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Sunny



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CSUGX081020 (A)

Roll No:.....

Jyothi Engineering College, Cheruthuruthy
FIRST SESSIONAL EXAMINATION

Semester SS , October 2020

(Department of CSE)

CS309 Graph Theory and Combinatorics

(KTU Scheme)

Max Marks:40

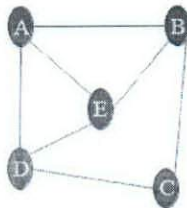
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PART A

1. Construct an adjacency matrix(X) for the following graph and also find X^2 (no need to multiply)



2. Find the following:
 - Incidence matrix
 - Adjacency matrix and
 - Path matrixfor the graph shown below:

10 (CO5)(L3)

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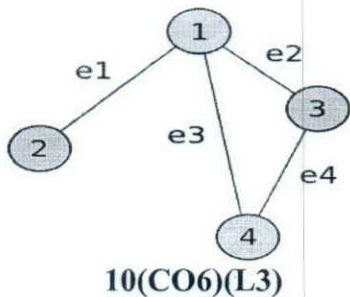
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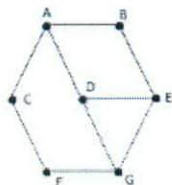


PART B

3. List down the Properties of cutset matrix and incidence matrix
10(CO5)(L2)
4. Prove that a simple graph with n vertices and k component can have atmost $(n-k)(n-k+1) / 2$ edges. Also draw a graph with 15 vertices each of degree 5
10(CO1)(L2)

PART C

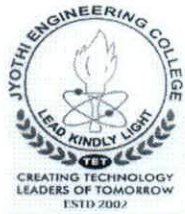
5. a) Prove the theorem- 'The number of vertices of odd degree in a graph is always even'.
5 (CO1)(BTL3)
- b) For the following pair of graphs, determine whether or not the graphs are isomorphic? Give the justification for your answer?



5(CO1)(BTL1)

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PROGRAM OUTCOMES, PROGRAM SPECIFIC OUTCOMES, PROGRAM EDUCATIONAL OBJECTIVES

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

Vision of the Department

Creating eminent and ethical leaders in the domain of Computational Sciences through quality professional education with a focus on holistic learning and excellence.

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- To instill Entrepreneurial Orientation and research motivation among the students of the department.
- To emerge as a leader in education in the region by encouraging teaching, learning, industry and societal connect.

Programme Educational Objectives (PEOs)

1. The graduates shall have sound knowledge of Mathematics, Science, Engineering and Management to be able to offer practical software and hardware solutions for the problems of industry and society at large.
2. The graduates shall be able to establish themselves as practicing professionals, researchers or Entrepreneurs in computer science or allied areas and shall also be able to pursue higher education in reputed institutes.
3. The graduates shall be able to communicate effectively and work in multidisciplinary teams with team spirit demonstrating value driven and ethical leadership.

Programme Outcomes

Engineering Graduates will be able to:

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- 4. Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- 5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
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and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

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COs of First year (Common to ALL Branches)

Course Code	Course Name	Course Outcome - On completion of this course the students will be able to	
C101	CALCULUS	C101.1	Acquire the knowledge of analysis compounds using various spectroscopic methods.
		C101.2	To acquire the knowledge about energy efficient batteries
		C101.3	Apply the knowledge in the analysis and separation of complex organic compounds, using modern instrumentation like TGA,DTA,HPLC,GC
		C101.4	To design and synthesis nano materials and polymers which are essential to human life.
		C101.5	Knowledge of methods to determine the calorific value of fuels and detailed knowledge about petroleum products and its application
		C101.6	Develop innovative methods to produce soft water for industrial use and different methods to purify waste water
C102	ENGINEERING PHYSICS	C102.1	Students will be able to familiarise with the basic concepts of oscillations and waves.
		C102.2	Students will be able to know the various phenomena of interference and diffraction of light.
		C102.3	Students will be able to study the wonderful aspects of polarization of light and superconductivity
		C102.4	Students will be able to develop the basic concepts of Quantum Mechanics and statistical mechanics
		C102.5	Students will be able to familiarise with the applications of acoustics and ultrasonics.
		C102.6	Students will be able to understand the concepts of lasers , optical fibres and solid state devices.
C103	ENGINEERING GRAPHICS	C103.1	Ability to know the fundamentals of Engineering Drawing Standards.

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A CENTRE OF EXCELLENCE IN SCIENCE & TECHNOLOGY BY THE CATHOLIC ARCHDIOCESE OF TRICHUR

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		C103.2	Able to prepare the orthographic projections of points and straight lines placed in various quadrants.
		C103.3	Demonstrate the ability to draw orthographic projections of various solids, sectioned views of solids, developments of solids, perspective projection and intersection of solids.
		C103.4	Ability to prepare neat drawings and proper dimensioning.
		C103.5	Able to understand the features of CAD software and preparation of Isometric and free hand sketching.
C104	INTRODUCTION TO COMPUTING & PROBLEM SOLVING	C104.1	Ability to identify different components of a computer
		C104.2	Ability to design algorithmic solution to problems.
		C104.3	Ability to convert algorithms to Python programs.
		C104.4	Ability to solve problems using object-oriented concept.
		C104.5	Ability to design modular Python programs using functions.
		C104.6	Ability to develop recursive solutions
C105	INTRODUCTION TO SUSTAINABLE ENGINEERING	C105.1	Student will be able to understand the different types of environmental pollution problems and their sustainable solutions
		C105.2	Student will be able to work in the area of sustainability for research and education
		C105.3	Student will have a broader perspective in thinking for sustainable practices by utilizing the engineering knowledge and principles
C106	BASICS OF ELECTRONICS ENGG	C106.1	Acquire the knowledge of analysis compounds using various spectroscopic methods.
		C106.2	To acquire the knowledge about energy efficient batteries
		C106.3	Apply the knowledge in the analysis and separation of complex organic compounds, using modern instrumentation like

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			TGA,DTA,HPLC,GC
		C106.4	To design and synthesis nano materials and polymers which are essential to human life.
		C106.5	Knowledge of methods to determine the calorific value of fuels and detailed knowledge about petroleum products and its application
		C106.6	Develop innovative methods to produce soft water for industrial use and different methods to purify waste water
C107	ENGINEERING PHYSICS LAB	C107.1	Students will be able to develop skills to impart practical knowledge in real time solution about some of the phenomena they have studied in the Engineering Physics course.
		C107.2	Students will be able to conduct, analyze and interpret experiments in Engineering Physics.
		C107.3	Students will be able to understand measurement technology and real time applications in engineering studies.
		C107.4	Students will be able to communicate verbally and graphically.
		C107.5	Students will be able to write the results of calculations in a clear and concise manner.
		C107.6	Students will be able to understand principle, concept, working and application of new technology.
		C108	COMPUTER PROGRAMMING LAB
C108.2	To implement algorithms studied in the course ICPS		
C108.3	To learn the implementation of control structures , Iterations, and recursive functions , Lists & Tuples & Dictinories		
C108.4	To implement operation on files		
C108.5	To implement a small micro project using python		
C109	Basic Engineering Workshop(EC)	C109.1	Students will gain knowledge of standard voltages and their tolerances, safety aspects of electrical

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			systems and importance of protective measures in wiring systems.
		C109.2	Students will be familiarized with the types of wires, cables and other accessories used in wiring.
		C109.3	Students should be able to wire simple lighting circuits for domestic buildings.
		C109.4	Students should be able to distinguish between light and power circuits.
C110	DIFFERENTIAL EQUATIONS	C110.1	Students can form and solve homogenous differential equations
		C110.2	Students can apply solution of homogeneous differential equations to form general solution
		C110.3	Students can analyze periodic functions in terms of their frequency components.
		C110.4	Students can identify and solve various partial differential equations
		C110.5	Students can form Wave equation and physically interpret the solutions.
		C110.6	Students can conclude quantitative statements about the physical meaning of the solution of heat equations related to engineering process.
C111	ENGINEERING CHEMISTRY	C111.1	Acquire the knowledge of analysis compounds using various spectroscopic methods
		C111.2	To acquire the knowledge about energy efficient batteries.
		C111.3	Apply the knowledge in the analysis and separation of complex organic compounds, using modern instrumentation like TGA,DTA,HPLC,GC
		C111.4	To design and synthesis nano materials and polymers which are essential to human life.
		C111.5	Knowledge of methods to determine the calorific value of fuels and detailed knowledge about petroleum products and its application
		C111.6	Develop innovative methods to produce soft water for industrial use and different methods to purify waste water.
C112	BE100: MECHANICS	C112.1	Students will be able to apply and demonstrate the



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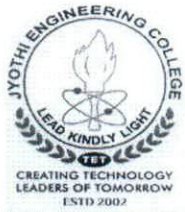
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			concepts of mechanics to practical engineering problems.
		C112.2	Students will be able to determine the properties of planes and solids.
		C112.3	Students will be able to apply fundamental concepts of dynamics to practical problems
		C112.2	Students will able to understand different types of Vibration and solve problems
		C112.5	Ability of the students to solve mechanics problems associated with friction forces
		C112.6	Students will be able to find out centre of mass and Momenmt of inertia of different geometry.
C113	BE102: DESIGN ENGINEERING	C113.1	Able to appreciate the different elements involved in good designs and to apply them in practice when called for
		C113.2	Aware of the product oriented and user oriented aspects that make the design a success.
		C113.3	Will be capable to think of innovative designs incorporating different segments of knowledge gained in the course
		C113.4	Students will have a broader perspective of design covering function, cost, environmental sensitivity, safety and other factors other than engineering analysis.
C114	CS100 : COMPUTER PROGRAMMING	C114.1	Students will be able to identify appropriate C language constructs to solve problems.
		C114.2	Students will be able to analyze problems, identify subtasks and implement them as functions/procedures.
		C114.3	Students will be able to implement algorithms using efficient C-programming techniques
		C114.4	Students will be able to explain the concept of file system for handling data storage and apply it for solving problems
		C114.5	Students will be able to apply sorting & searching techniques to solve application programs.
C115	EC100 : BASICS OF ELECTRONICS ENGINEERING	C115.1	Student can identify the active and passive electronic components, Will be able to know various types of components Understand its

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			specifications.
		C115.2	Student can familiarize the working of diodes, transistors, and integrated circuits.
		C115.3	Student can understand the working of rectifiers, amplifiers and oscillators.
		C115.4	Student can have a basic knowledge about measuring instruments
		C115.5	Student can get a fundamental idea of basic communication systems.
		C115.6	Student can get a basic idea of Entertainment systems.
C116	CY110:ENGINEERING CHEMISTRY LAB	C116.1	An ability to gain knowledge about different types of qualitative and quantitative estimation
		C116.2	An ability to understand, explain and use instrumental techniques for chemical analysis
		C116.3	Students will be able to apply and demonstrate the theoretical concepts of engineering chemistry and to develop scientific attitude
		C116.4	Students will be able to analyze the quality of water by determining its chemical parameters
		C116.5	Students will be able to measure chemical parameters to solve problems both individually as well as in team by analyzing and interpreting data from arrange of sources.
		C116.6	To acquire the skill for the preparation of engineering materials like polymers.
C117	CS120 : COMPUTER PROGRAMMING LAB	C117.1	Students will be able to analyse a problem, find appropriate programming language construct should be used and implement C program for the problem.
		C117.2	Develop C programs involving functions, recursion, pointers, and structures.
		C117.3	Design applications using sequential and random access file processing.
		C117.4	Develop C programs for simple applications making use of basic constructs, arrays and strings
		C117.5	Write programs that perform operations using

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			derived data types
C118	EC110: BASIC ENGINEERING WORKSHOP - EC	C118.1	Graduates will be able to identify electronics components like Resistors, Capacitors, Diodes, Transistors and UJT
		C118.2	Graduates will be able to use measuring instruments like the multimeter, Function generator, Power supply & DSO.
		C118.3	Graduates will be able to test all Active and Passive Components
		C118.4	Graduates will be able to assemble circuits on a breadboard.
		C118.5	Graduates will be able to Understand PCB fabrication process, assembling, dismantling systems.
		C118.6	Graduates understand soldering and desoldering skills, useful in electronic circuit interconnections

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C201	MA201 : LINEAR ALGEBRA & COMPLEX ANALYSIS	C201.1	Students will be able to achieve algebraic methods to find the solution for engineering computational problems, including vector spaces and eigen value problems
		C201.2	Students will be able to apply the properties of matrix in various situations.
		C201.3	Students will be able to analyse the properties of points lying in the n-dimensional plane.
		C201.4	Students will be able to sketch out complex functions and evaluate the definite Integrals

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		C201.5	Students will be able to represent the complex functions and its image graphically
		C201.6	Students will be able to solve complex integrals in different ways
C202	CE 201: Mechanics of Solids	C202.1	Able to calculate internal forces in members subject to axial loads, shear, torsion and bending and plot their distributions
		C202.2	Able to calculate normal, shear, torsion and bending stresses and strains
		C202.3	Able to transform the state of stress at a point and can determine the principal and maximum shear stresses using equations as well as the Mohr's circle
		C202.4	Able to understand the column buckling and the critical load and stress
		C202.5	Able to evaluate beams by finding their deflection by various methods.
		C202.6	Able to assess the mechanical properties of elastic materials
C203	CE 203: Fluid Mechanics – I	C203.1	Able to get a basic knowledge of fluids in static, kinematic and dynamic equilibrium, so as to solve real life problems in fluid mechanics
		C203.2	Able to get a basic knowledge of fluids in kinematic and dynamic equilibrium, so as to solve real life problems in fluid mechanics
		C203.3	State Euler's and Bernoulli's equations and the conservation of mass to determine velocities, pressures, and accelerations for incompressible and inviscid fluids.
		C203.4	Design simple pipe systems to deliver fluids under specified conditions.
		C203.5	Describe the concepts of viscous boundary layers and the momentum integral and use them to determine integral thicknesses.
C204	CE 205: Engineering Geology	C204.1	Able to awareness about earth resources and processes to be considered in various facets of civil engineering
		C204.2	Able to awareness about hydrogeology, problems created in construction and subsurface control methods
		C204.3	Able to awareness about earthquakes, various minerals and

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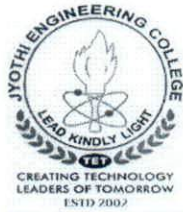


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			their properties
		C204.4	Able to awareness about rocks, formation of rocks, and their physical properties
		C204.5	Able to awareness about altitude of geological structures, natural hazards, geological factors considered in the construction of various structural members
C205	CE 207: Surveying	C205.1	explain the concepts of principles of surveying and methods of ranging
		C205.2	understand fundamental idea about levelling and its application contour maps its relevance etc
		C205.3	understand fundamental concepts to find area and volume of irregular plot and application of theodolite
		C205.4	understand fundamental concepts theory of triangulation satellite station its application etc
		C205.5	understand fundamental concepts of theory of errors and its practical application
		C205.6	understand fundamental concepts and get aware about EDM and Total station
C206	HS 210: Life Skills	C206.1	Communicate effectively.
		C206.2	Make effective presentations
		C206.3	Write different types of reports
		C206.4	Face interview & group discussion
		C206.5	Critically think on a particular problem
		C206.6	Solve problems.
C207	CE 231: Civil Engineering Drafting Lab	C207.1	Students will be able to understand the fundamentals of Civil Engineering drawing
		C207.2	Students will be able to get the knowledge to interpret base level building plans.
		C207.3	Students will be able to understand the principles of planning
		C207.4	Students will be able to learn drafting of buildings
		C207.5	Students will be able to impart knowledge on drafting software such as AutoCAD.
C208	CE 233: Surveying Lab	C208.1	To equip the students to undertake survey using tachometer
		C208.2	To equip the students to undertake survey using total station
		C208.3	To impart awareness on distomat and handheld GPS

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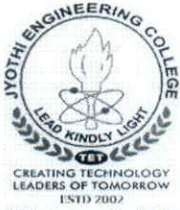


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		C208.4	To provide an awareness of conventional methods in surveying
		C208.5	To improve their ability to work as team
		C208.6	To understand the real life hurdles while conducting a survey
C209	MA 201: Probability Distributions, Transforms and Numerical Methods	C209.1	Students will be able to apply the concept of discrete probability density functions and special probability Distributions in different engineering fields.
		C209.2	Students will be able to apply the concept of continuous discrete probability density functions and special probability Distributions in different engineering fields.
		C209.3	Students will be able to express the non periodic function as fourier integrals.
		C209.4	Students will be able to solve differential equations using Laplace Transform
		C209.5	Students will be able to use numerical methods and their applications in solving engineering problems.
		C209.6	Students will be able to solve the differential equations using numerical techniques
C210	CE202: Structural Analysis- I	C210.1	To utilize comprehensive methods of structural analysis with emphasis on analysis of elementary structures
		C210.2	To apply different methods to find out deflection of a structure
		C210.3	To identify, formulate and solve engineering problems connected to indeterminate structures and their analysis
		C210.4	To apply basic knowledge of moving loads and influence line diagrams
		C210.5	To get the basic concept to analyse the forces in cables and suspension bridges
		C210.6	To apply the concept of three hinged arches in practical engineering problems
C211	CE204: Construction Technology	C211.1	To understand construction materials , their components and manufacturing process
		C211.2	To know the properties of concrete and different mix design methods
		C211.3	To get the details regarding the construction of building components.
		C211.4	To analyse and apply learning of materials , structure , servicing and construction of masonry domestic buildings
		C211.5	To define and describe the concepts and design criteria of tall framed and load bearing buildings.

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C212	CE206: Fluid Mechanics- II	C212.1	Explore the Concept of open channel flow
		C212.2	Understand fundamental meaning of Hydraulic jump
		C212.3	Analyze the fundamentals of Non uniform flow
		C212.4	Understand fundamental concepts of Turbines & Pumps
		C212.5	Importance of Dimensional analysis in real world problems
C213	CE208: Geotechnical Engineering- I	C213.1	The students will be able to create an awareness on the basic principles governing soil behavior
		C213.2	The students will be able to analyse and classify soil based on standard geotechnical engineering practice.
		C213.3	The students will be able to perform and laboratory tests on permeability of soils and analyze the coefficient of permeability of soils
		C213.4	The students will be able to understand the shear strength of soil and laboratory methods to find out the shear strength parameters of soil
		C213.5	The students be able to conduct one-dimensional compression tests and estimate settlement parameters
		C213.6	The students will be able to evaluate the stability of slopes by considering various slope analysis methods
C214	HS 200: Business Economics	C214.1	To familiarize the prospective engineers with elementary Principles of Economics and Business Economics
		C214.2	To acquaint the students with tools and techniques that are useful in their profession in Business Decision Making which will enhance their employability.
		C214.3	To apply business analysis to the "firm" under different market conditions.
		C214.4	To apply economic models to examine current economic scenario and evaluate policy options for addressing economic issues
		C214.5	To gain understanding of some Macroeconomic concepts to improve their ability to understand the business climate.
		C214.6	To prepare and analyse various business tools like balance sheet, cost benefit analysis and rate of returns at an elementary level
C215	CE232: Materials Testing Lab I	C215.1	Students will understand different mechanical properties and characteristics of materials
		C215.2	Students will be to evaluate the strength of various structural elements internal forces such as compression, tension, shear, bending and torsion

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		C215.3	Students will be able to develop skills on drawing inference from their practical experience that help them to design mechanical components
		C215.4	Students will be able to derive knowledge individually and as a team that will help them to learn courses related to material science.
		C215.5	Students will be to evaluate the behavior and strength of structural elements under the action of compound stresses and thus understand failure concepts
C216	CE234: Fluid Mechanics Lab	C216.1	Students will be able to develop the skill on selecting various taps, valves, pipe fittings, gauges, pitot tubes, water meters etc.
		C216.2	Students will be able to apply the fundamental principles of fluid mechanics in calculations involving basic flow measuring devices in both closed and open channel flows
		C216.3	Students will be able to select an appropriate pump/turbine with reference to given application/situation.
		C216.4	Students will be able to analyze the performance characteristics pumps/turbines.
		C216.5	Students will be able to predict the stability of a floating vessel following the principles of metacentric height and radius of gyration
C301	CE301: Design of Concrete Structures I	C301.1	The students will be able to apply the fundamental concepts of limit state method.
		C301.2	The students will be able to design for shear using IS code of practice.
		C301.3	The students will be able design reinforced concrete elements in bending and torsion.
		C301.4	The students will be able to design slabs subjected to various load conditions
		C301.5	The students will be able to analyze and design for deflection and crack control of reinforced concrete members and also to design two way slabs
		C301.6	The students will be able to design columns and staircases.
C302	CE303: Structural Analysis- II	C302.1	Students will be able to analyze the continuous beams using Clapeyrons Theorem
		C302.2	Students will be able to analyze beams and frames using Slope deflection method
		C302.3	Students will be able to analyze beams and frames using Moment distribution method

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A CENTRE OF EXCELLENCE IN SCIENCE & TECHNOLOGY BY THE CATHOLIC ARCHDIOCESE OF TRICHUR

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		C302.4	Students will be able to analyze beams and frames using Kani's method
		C302.5	Students will be able to analyze curved beams in plan
		C302.6	Students will be able to analyze structures using plastic theory
C303	CE305: Geotechnical Engineering- II	C303.1	To understand the basic concepts, theories and methods of analysis and design in foundation engineering;
		C303.2	To identify the field problems related to geotechnical engineering and to take appropriate engineering decisions.
		C303.3	To select and design the foundations as per field condition
		C303.4	To evaluate the consolidation settlement in the field
		C303.5	To learn the ability to use modern soil mechanics equipment for ground improvement and soil investigation procedures.
C304	CE307: Geomatics	C304.1	The students will possess knowledge on the Concepts of Traverse Surveying.
		C304.2	Understanding of the layout of Horizontal Curves and Vertical curves.
		C304.3	Gain a basic understanding of the principles, operation and surveying of the Global Positioning System.
		C304.4	Understand the concept of Remote Sensing and its Application
		C304.5	Identifying the concept and uses of the GIS system
C305	CE309: Water Resources Engineering	C305.1	Students will be able to understand the availability of water on hydrosphere, its distribution and quantification.
		C305.2	Students will be able to determine crop water requirements for design of irrigation systems.
		C305.3	Students will be able to compute the yield of aquifers and wells.
		C305.4	Students will be able to understand the various features of river training works.
		C305.5	Students will be able to estimate the storage capacity of reservoirs and their useful life
		C305.6	Students will be able to acquire the knowledge on the scientific methods for computing irrigation water requirements.
		C305.7	Students will be able to acquire fundamental knowledge on reservoir engineering and river engineering
C306	CE365: Functional Design of Buildings	C306.1	to understand and analyze effective decisions in use of principles of functional planning with respect to acoustics

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		C306.2	to understand various auditorium design and lighting and thermal design of building in various climatic zones that the students may encounter in his/her professional career
		C306.3	to select different building material and explain the manner in which they can be used in different types of buildings with respect to various functional requirements like Acoustics lighting thermal comfort etc
		C306.4	To apply the techniques learned to the estimate of solar radiation falling on different surfaces of buildings
		C306.5	to design shading device to protect from direct sunlight and also design energy efficient design functionally comfortable low energy green buildings considering various climatic conditions
C307	CE371: Environment and Pollution	C307.1	Students will be able to learn about environment, various types of pollution, pollutants, related diseases
		C307.2	To study about source and effects of air pollution and different control measures
		C307.3	To understand about water pollution, its causes and treatments
		C307.4	To study about solid wastes and its management
		C307.5	To learn about effects of land pollution and its abatement measures
		C307.6	To understand about noise pollution, its effects and control measures
C308	CE341: Design Project	C308.1	Students can explore the latest developments in engineering
		C308.2	Students can undertake a thorough review on literature
		C308.3	Students can understand the engineering aspects of design
		C308.4	Students can understand the various concepts in design, process and systems
		C308.5	Students can explore the various solutions for engineering problems
		C308.6	Students get an overview on technical presentations and writing
C309	CE331: Materials Testing Lab II	C309.1	Understand the fundamentals of civil constructions
		C309.2	Preparation of concrete mix design
		C309.3	Acquire the knowledge of properties of building materials like cement, aggregates, tiles.
		C309.4	Study the tests on fresh concrete



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		C309.5	Improve the ability of team work
C310	CE 333: Geotechnical Engineering Lab	C310.1	Students will be able to gain knowledge about the procedures of laboratory tests used for determination of physical, index and engineering properties of soils
		C310.2	Students should have the capability to classify soils based on test results and interpret engineering behavior based on test results
		C310.3	Students will be able to evaluate the permeability and shear strength of soils
		C310.4	Students will be able to evaluate settlement characteristics of soils
		C310.5	Students will be able to evaluate compaction characteristics required for field application
C311	CE302: Design of Hydraulic Structures	C311.1	Perform the stability analysis of gravity dams
		C311.2	Graduates shall be able to familiar with the different types of dams, components, design criteria and causes of failure
		C311.3	Design major and minor irrigation structures such as surplus works, regulators, canal fall and cross drainage works
		C311.4	Graduates shall be able to understand basic knowledge about hydraulic structures
		C311.5	Graduates can be able to read working drawings
C314	CE308: Transportation Engineering- I	C314.1	Design various geometric elements of a highway
		C314.2	Determine the characteristics of pavement materials and design flexible pavements
		C314.3	Conduct traffic engineering studies and analyze data for efficient management of roadway facilities
		C314.4	Plan and design basic airport facilities
		C314.5	Enhance the presentation ability and team work
		C314.6	Identification of traffic aids and failures in pavement
C315	HS300 : Principle of Management	C315.1	Students will be able to recall and identify the relevance of management concepts
		C315.2	Students will be able to describe, discuss and relate management techniques adopted within an organization
		C315.3	Students will be able to apply management techniques for meeting current and future management challenges faced by the organization
		C315.4	Students will be able to compare the management theories



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			and models critically and to inspect and question its validity in the real world
		C315.5	Students will be able to assess and modify different theories of management so as to relate it to current management challenges
		C315.6	Students will be able to apply principles of management in order to execute the role as a manager
C317	CE332: Transportation Engineering Lab	C317.1	Know about various properties required for different types of pavement constructions
		C317.2	Know about selection of different pavement construction materials based on the properties..
		C317.3	Students will be able to correlate the lab experience with field and can identify the tests to be done for checking the quality.
		C317.4	students will be able to enhance their learning and thinking ability
		C317.5	Students will be able to work independently and in groups
		C317.6	Students will be able to communicate their ideas and concepts
C401	CE 401: Design of steel Structures	C401.1	Students should be able to analyze and design bolted and welded connections.
		C401.2	Students should be capable to analyze and design tension members using the IS specifications
		C401.3	Students should be aware of various connections in steel columns and able to design columns under axial loads using IS specifications
		C401.4	Students should be able to design beams and plate girders
		C401.5	Students should be able to assess loads on truss and design purlins.
		C401.6	Students should be aware on design of Structural Components Using Timber.
C402	CE 403: Structural Analysis- III	C402.1	Students will be able to analyse structures using the approximate method
		C402.2	Students will be able to understand the basics of matrix analysis
		C402.3	Students will be able to analyse trusses, continuous beams, and rigid frames using flexibility method
		C402.4	Students will be able to analyse trusses, continuous beams, and rigid frames by stiffness method
		C402.5	Students will be able to conceive Finite element procedures by direct stiffness method

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		C402.6	Students will be able to use the basics of structural dynamics and analyse the response of SDOF systems
C403	CE 405: Environmental Engineering I	C403.1	Students will be able to understand the various water quality parameters and its interpretation
		C403.2	Students will be able to design sedimentation tanks for water treatment
		C403.3	students will be able to design slow and rapid sand filters of water treatment plants
		C403.4	Students will be able to study the various disinfection methods of drinking water
		C403.5	Students will be able to design a water distribution system
		C403.6	Students will be able to study the various methods for remediation of domestic water quality problems
C404	CE 407: Transportation Engineering- II	C404.1	Students will be able to learn and improve their contemporary knowledge about other means of transportation such as railways, waterways and tunneling
		C404.2	Graduates will be able to plan, design, construct and operate systems in railway transportation
		C404.3	They will be learning the need and frequency and method of maintenance of railway track and the factors that cause railway accidents
		C404.4	Students will gain knowledge in various aspects of tunnel engineering starting from the selection of site, fixing alignment, constructing and providing proper lighting, ventilation and drainage.
		C404.5	Students will be able to learn about various components in water transportation such as harbours, break waters and docks.
		C404.6	Analytical skill as well as problem solving and optimizing ability is enhanced along with the ability to work individually and in a group, prepare presentations and improve on communication skill
C405	CE 409: Quantity Surveying and Valuation	C405.1	Students will be able to prepare approximate estimation and detailed estimation for buildings.
		C405.2	Students will able to study draw the specifications for the different items of civil engineering project and also to prepare the schedule of programming of the project
		C405.3	Students will be able to prepare detail estimation for sanitary works, road works etc.
		C405.4	Students will able to calculate the exact quantities and rates

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			for different materials required for various items of work by using data book and schedule of rate.
		C405.5	Students will be able to prepare valuation report of real and landed property
C406	CE473 : ADVANCED COMPUTATIONAL TECHNIQUES AND OPTIMIZATION	C406.1	Students will be able find different numerical solutions of complicated problems
		C406.2	Students will be able identify different types of optimization problems and to solve various multivariable optimization problems
		C406.3	Students will be able determine solutions of real time problems applying numerical methods in mathematics
		C406.4	Students will be able convert problem solving strategies to procedural algorithms and to write program structures
		C406.5	Students will be able understand fundamental mathematics and to solve problems of algebraic and differential equations, simultaneous equation, partial differential equations
		C406.6	Students will be able understand the importance of optimization and apply optimization techniques in real time problems
C407	CE465 : GEO ENVIRONMENTAL ENGINEERING	C407.1	Students will be able to understand the relevance of geoenvironmental engineering with emphasis on soil-water-contaminant interaction
		C407.2	Students will be able to appreciate the concept of valorization of waste in geotechnical applications
		C407.3	Students will be able to understand the various components in a landfill and its design
		C407.4	The students will be able to understand the characteristics of the various by-products generated from the landfill
		C407.5	The students will be able to understand the techniques available and its applicability for soil remediation
		C407.6	The students will be able to understand the change in engineering properties of soil due to change in environment
C408	CE 451: Seminar & Project Preliminary	C408.1	Student can explore the latest developments in various spheres of civil engineering
		C408.2	Student can undertake a critical review of the literature on the chosen topic
		C408.3	Student can learn technical report writing effectively
		C408.4	Student can present a technical paper fluently and convincingly
		C408.5	Student will be able to develop right competency and skill to

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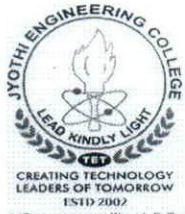


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			learn new technologies and apply it in professional practices and motivate fellow professionals to imbibe them
C409	CE431: Environmental Engineering Lab	C409.1	Students will be able to analyze the physical water quality parameters like turbidity pH, color, taste and odor and to meaningfully interpret the results
		C409.2	Students will be able Analyze the chemical water quality parameters like iron, manganese, hardness , organic matter etc and to interpret the test result
		C409.3	Students will be able To study the water treatment by conventional plant operation and to find the optimum quantity of coagulant using jar test
		C409.4	Students will be able To analyze the presence of indicator bacteriological organisms like coliform in water and interpret the result to give guidance to the people
		C409.5	Students will be able to deal with domestic water quality issues of the area and to guide the people for its remediation
C410	CE 402: Environmental Engineering II	C410.1	Measure the waste water flow and design of circular sewer
		C410.2	Understand and interpret various characteristics of waste water with special reference to organic matter
		C410.3	Assess the self-purification capacity of rivers
		C410.4	Design conventional waste water systems like activated sludge and trickling filter
		C410.5	Design septic tank , oxidation pond and UASB
		C410.6	Design of various sludge disposal systems
C411	CE 404: Civil Engineering Project Management	C411.1	Plan and schedule a construction project.
		C411.2	Will be able to understand the uses and suitability of various construction equipment and codification of planning system
		C411.3	Study the role arbitrator and the process of arbitration and importance of construction cost
		C411.4	Study the legal and ethical issues related to construction projects and concepts of computerized information system
		C411.5	Impart knowledge in the principles of safe construction practices and material management
		C411.6	Understand the need of different construction procedure and preparation of tender document and contract document and familiar with TQM and similar concepts related to quality
C412	CE462 : TOWN AND COUNTRY PLANNING	C412.1	Student will be able to identify and develop the various components of planning at neighborhood, city, regional and national levels

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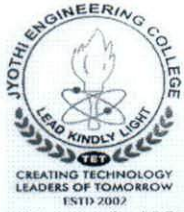


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		C412.2	Student will be able to learn urban-rural nexus in planning and integrated planning approach
		C412.3	Student will be able to learn theories of urbanization in thier planning, principles and strategies
		C412.4	Student will be able to familiarize with spatial standards of facilities and prepare base maps for urban development
		C412.5	Student will be able to learn the development control rule which gives the required legal support to the city plans and also contain elementary aspects of urban renewal.
		C412.6	Student will be able to identify and develop the various components of Town Development Plan
C413	CE474 : Municipal solid waste management	C413.1	Students will have an awareness of different types of solid wastes in the environment.
		C413.2	Students will be able to understand the various methods available for estimation of generation rate of solid waste and its quantities.
		C413.3	Students will have an awareness about the collection methods of solid waste.
		C413.4	Students will have an awareness about the processing techniques of solid waste.
		C413.5	Students will be able to understand the various methods for the disposal of solid waste.
		C413.6	Students will be able to understand the various composting techniques of solid waste.
C414	BT 362 : SUSTAINABLE ENERGY PROCESS	C414.1	Students should be able to identify global and Indian energy sources.
		C414.2	Students should be able to explain capture, conversion and application of solar energy
		C414.3	Students should be able to explain capture, conversion and application of wind energy
		C414.4	Students should be able to explain conversion of biomass to energy
		C414.5	Students should be able to explain the capture of energy from oceans
		C414.6	Students should be able to explain fuel cells and energy storage routes
C415	CE 492: Project	C415.1	Knowledge and confidence in approaching a problem in a systematic way.
		C415.2	Knowledge about various data collection techniques and methods.

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		C415.3	Knowledge of data preparation and exploration and further drawing of inferences
		C415.4	Learn application of various analysis software, interpret the output and present the results
		C415.5	Improvement in technical report writing and presentation skills.

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