A

COURSE FILE

ON

“DEVOPS”

III B-Tech I Semester

COMPUTER SCIENCE & ENGINEERING

CMR ENGINEERING COLLEGE

KANDLAKOYA (V), MEDCHAL (M), R.R.DIST.

A.Y 2023-24

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Submitted By

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Asst.Professor,

CSE Dept

1. DEPARTMENT VISION & MISSION

VISION OF THE DEPARTMENT

To produce globally competent and industry-ready graduates in Computer Science & Engineering by imparting quality education with the know-how of cutting-edge technology and holistic personality.

MISSION OF THE DEPARTMENT

1. To offer high-quality education in Computer Science & Engineering in order to build core competence for the graduates by laying a solid foundation in Applied Mathematics and program framework with a focus on concept building.

2. The department promotes excellence in teaching, research, and collaborative activities to prepare graduates for a professional career or higher studies.

3. Creating an intellectual environment for developing logical skills and problem-solving strategies, thus developing, an able and proficient computer engineer to compete in the current global scenario.

2.1 Program Educational outcome (PEOs):

PEO 1: Excel in professional career and higher education by acquiring knowledge of mathematical computing and engineering principles.

PEO 2: To provide an intellectual environment for analyzing and designing computing systems for technical needs.

PEO 3: Exhibit professionalism to adapt current trends using lifelong learning with legal and ethical responsibilities.

PEO 4: To produce responsible graduates with effective communication skills and multidisciplinary practices to serve society and preserve the environment.

2.2 Program Outcomes (POs):

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems

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

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

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

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

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

8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice

9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings

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

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

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.

2.3 Program Specific Outcomes (PSOs):

PSO1: Professional Skills and Foundations of Software development: Ability to analyze, design and develop applications by adopting the dynamic nature of Software developments.

PSO2: **Applications of Computing and Research Ability:** Ability to use knowledge in cutting edge technologies in identifying research gaps and to render solutions with innovative ideas.

NBA Graduate Attributes

PO1 Engineering knowledge

PO2 Problem analysis

PO3 Design/development of solutions

PO4 Conduct investigations of complex problems

PO5 Modern tool usage

PO6 The engineer and society

PO7 Environment and sustainability

PO8 Ethics

PO9 Individual and team work

PO10 Communication

PO11 Project management and finance

PO12 Life-long learning

3. Mapping of Course/ Program Outcomes to Program Educational Objectives

COURSE OUTCOMES:

CO's	Description
CO1	**Explain** traditional software development methodologies like a waterfall.
CO2	**Apply** the agile methodologies and comparing various other software development models with agile.
CO3	**Explain** implementing continuous integration and continuous delivery.
CO4	**Explain** CAMS for DevOps (Culture, Automation, Measurement, and Sharing)
CO5	**Create** quick MVP prototypes for modules and functionalities.

4. Syllabus copy

R20 B.TECH

UNIT –I
UNIT I:
TRADITIONAL SOFTWARE DEVELOPMENT
The Advent of Software Engineering, Waterfall method, Developers vs IT Operations conflict
UNIT II:
RISE OF AGILE METHODOLOGIES
Agile movement in 2000, Agile Vs Waterfall Method, Iterative Agile Software Development, Individual and team interactions over processes and tools, Working software over comprehensive documentation, Customer collaboration over contract negotiation, Responding to change over following a plan
UNIT III:
DEFINITION OF DEVOPS
Introduction to DevOps, DevOps and Agile.
UNIT IV:
PURPOSE OF DEVOPS
Minimum Viable Product, Application Deployment, Continuous Integration, Continuous Delivery
UNIT V:
CAMS (CULTURE, AUTOMATION, MEASUREMENT AND SHARING)

CAMS – Culture, CAMS – Automation, CAMS – Measurement, CAMS – Sharing, Test-Driven Development, Configuration Management, Infrastructure Automation, Root Cause Analysis, Blamelessness, Organizational Learning.

TEXT BOOKS:

1. Dev Ops – Volume 1 , Pearson and Xebia Press

REFERENCE BOOKS:

1. The DevOps Handbook - Book by Gene Kim, Jez Humble, Patrick Debois, and Willis
2. What is DevOps? - by Mike Loukides

5.Individual Time Table

Mr.MD.Azhar

	I(9:10-10:10)	II(10:10-11:00)	III(11:00-11:50)	IV(11:50-12:40)		V(1:20-2:20)	VI(2:20-3:10)	VII(3:10-4:00)
MON								DEVOPS-III-D
TUE								
WED								
THU								
FRI		DEVOPS-III-C					DEVOPS-III-B	DEVOPS-III-A
SAT								

6.SESSION PLAN / LESSON PLAN

S.No	Topic (JNTU syllabus)	Sub-Topic	No.of Lectures Required	Suggested Books	Method of Teaching	Remarks
1	UNIT-I	**TRADITIONAL SOFTWARE DEVELOPMENT** The Advent of Software Engineering	L1	T1	M1	
2		Waterfall method	L2	T1	M1	
3		Developers vs IT Operations conflict	L3	T1	M1	

4		**RISE OF AGILE METHODOLOGIES** Agile movement in 2000, Agile Vs Waterfall Method	L4	T1	M4	
		Iterative Agile Software Development	L5	T1	M1	
6	**UNIT-II**	Individual and team interactions over processes and tools	L6	T1	M1	
7		Working software over comprehensive documentation	L7	T1	M1	
8		Customer collaboration over contract negotiation, Responding to change over following a plan	L8	T1	M1	
9	**UNIT-III**	**DEFINITION OF DEVOPS** Introduction to DevOps	L9	T1,R2	M4	
10		DevOps and Agile	L10	T1,R2	M1	
11		**PURPOSE OF DEVOPS** Minimum Viable Product, Application Deployment	L11	T1	M1	
12	**UNIT-IV**	Continuous Integration, Continuous Delivery	L12	R1	M4	
13		**CAMS (CULTURE, AUTOMATION, MEASUREMENT AND SHARING)** CAMS – Culture, CAMS – Automation, CAMS – Measurement, CAMS – Sharing	L13	T1	M1	
14	**UNIT-V**	Test-Driven Development, Configuration Management,	L14	T1	M1	
15		Infrastructure Automation, Root Cause Analysis,	L15	T1	M1	

16		Blamelessness, Organizational Learning.	L16	T1	M1	
TOTAL			**16**			

METHODS OF TEACHING

M1 : Lecture Method	**M6 : Tutorial**
M2 : Demo Method	**M7 : Assignment**
M3 : Guest Lecture	**M8 : Industry Visit**
M4 : Presentation /PPT	**M9 : Project Based**
M5 : Lab/Practical	**M10 : Charts / OHP**

7.Session execution log

S.NO	UNIT No.	Starting Date	Ending Date
1	UNIT-I	21/8/2023	15/9/2023
2	UNIT-II	16/9/2023	15/10/2023
3	UNIT-III	16/10/2023	15/11/2023
4	UNIT-IV	16/11/2023	30/11/2023
5	UNIT-V	01/12/2023	23/12/2023

8.Lecture Notes

(Attached)

9.Assignment Questions

N/A

10.Mid exam question papers (samples)

N/A

11.Scheme of evaluation

N/A

12.Mapping of Cos with Pos and PSOs

Course Outcomes	Relationship of Course outcomes to Program Outcomes (PO AVG)													
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO 1	PSO2
CO1	1	-	-	-	-	-	-	-	-	-	2		1	
CO2	2		2	-	-	-	-	-	-	-	2		2	
CO3	1	-	-	-	1	-	-	-	-	-	1		1	
CO4	2	-	1	-	2	-	-	-	-	-	2		1	
CO5	1	-	-	-	-	-	-	-	-	-	1		1	
AVERAGE	**1**		**2**		**2**						**2**		1	

13.COs,POs,PSOs Justification

N/A

14. Attainment of COs,POs and PSOs (Excel Sheet)

N/A

15.Previous year Question Papers

III - B.TECH- I-SEM END EXAMINATION

Date: **28-11-2022** **Time*:* 3 HOURS**

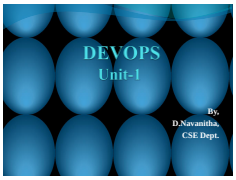
Subject: DEVOPS **Branch: CSE** **Marks: 100M**

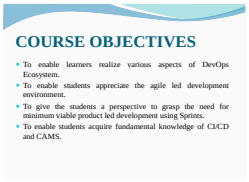
Answer any five questions. Each question carries 20 marks.

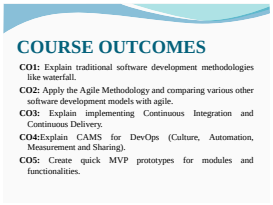
5x20=100 M

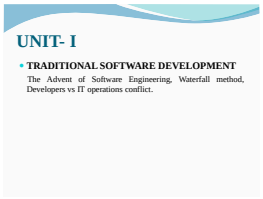
1. Explain about Waterfall model in detail.
2. Distinguish between Waterfall model and Agile model.
3. Discuss about iterative agile software development.
4. a) Define Devops. Discuss about Devops tools in detail.
b) Compare Devops and Agile.
5. Explain about Continuous Integration and Continuous Delivery.
6. Explain about CAMS in detail.
7. Discuss about Test Driven Development.
8. What is Configuration Management? Explain in detail.

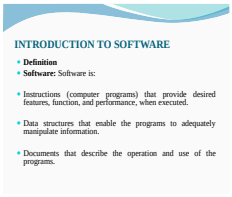
16..Power Point Presentations (PPTs)

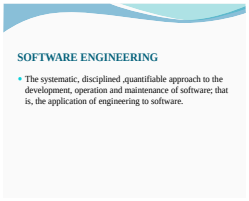


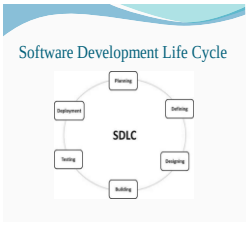


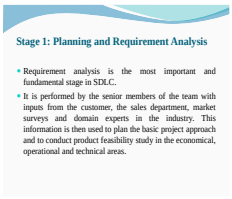


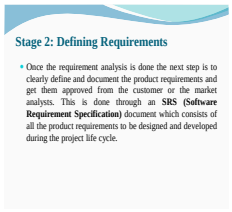


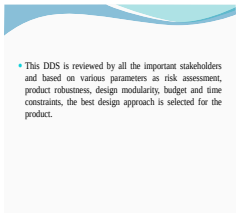


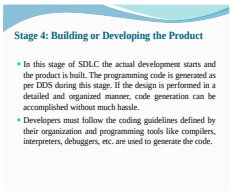


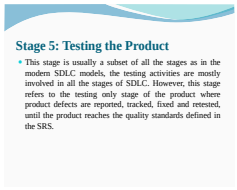


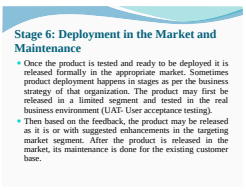


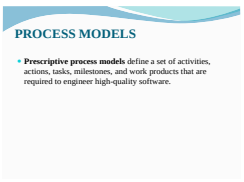


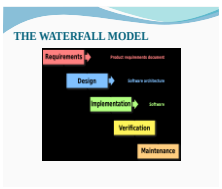


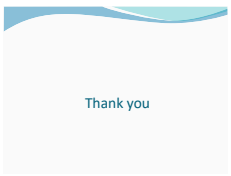












17. Innovative Teaching Methodologies

N/A

18Reference[Text Books/Websites/Journals]

https://www.coursera.org/learn/intro-to-devops

https://www.coursera.org/specializations/devops-cloud-and-agile-foundations

https://www.udemy.com/course/decodingdevops/

https://www.udemy.com/course/learn-devops-ci-cd-with-jenkins-using-pipelines-and-docker/

https://www.edureka.co/devops-certification-training