Shri. Balasaheb Mane Shikshan Prasarak Mandal's
ASHOKRAO MANE GROUP OF INSTITUTIONS
FACULTY OF ENGINEERING
DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
NH – 4, Wathar Tarf Vadgaon, Tal: - Hatkanangale, Dist: - Kolhapur - 416112.
Phone: (0230) 2407740, 2407750, 2407760 Fax: (0230) 2407750

Third Year B. Tech CSE

Subject: - Database Systems **Subject Code: BTCOC501**

Course Outcomes (COs):-

Upon completion of this course, students will be able to	
CO1	Understand fundamentals of database systems and applications and architecture.
CO2	Apply Relational Data Model,Relational Algebra and Calculus
CO3	Understand SQL, Use of SQL in modification of database through application programs.
CO4	Apply normalization and indexing, hashing to organizing data.
CO5	Understand the transaction processing and ACID property.

CO-PO Mapping:-

CO	PO												PSO		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3											2		1	
CO2	3			2									1		
CO3	3				2									1	
CO4	3											2		1	
CO5	3											1			
Avg.	3			2	2							1.6	1	1	

CO-PO Mapping Justification:-

CO No	PO/PSO	CL	JUSTIFICATION
1	PO 1	3	Strongly mapped as the knowledge in fundamental programming methodologies help students in designing solutions for complex engineering problems.
	PO 12	2	Moderately mapped as Information acquired from the fundamentals of Database system provides lifelong learning in the context of technological change.
	PSO 2	1	Slightly mapped as students will have the knowledge in programming methodologies like database query language help in designing solutions and analyzing its complexity.
2	PO1	3	Strongly mapped as students will have the knowledge of relational algebra and relational calculus can be applied to solve complex engineering problems.
	PO4	2	Moderately mapped as students will have the knowledge of extended relational algebra expression and relational calculus which help in analysis of solutions to complex problems.
	PSO1	1	Slightly mapped as students will have the knowledge of extended relational algebra expressions to demonstrate the knowledge of recent technologies.
3	PO1	3	Strongly mapped as students gain knowledge SQL.
	PO5	2	Moderately mapped as students are able to analyze and apply apply appropriate techniques of SQL
	PSO2	1	Slightly mapped as students demonstrate the knowledge of SQL and advanced structured query Languages in computer based problem solving.
4	PO1	3	The knowledge of various indexing hashing techniques can be applied in designing solutions to complex engineering problems
	PO12	2	Moderately mapped as knowledge of normalization, Indexing, hashing techniques can be applied to solve various problems this provides lifelong learning in the context of technological change.
	PSO2	1	Slightly mapped as students gain the knowledge of various sorting and hashing techniques can be applied in designing solutions to complex multidisciplinary engineering problems.
5	PO1	3	The knowledge of various transaction models can be applied in designing solutions to complex engineering problems.
	PO12	2	Moderately mapped as Information acquired from the fundamentals of transaction management provides lifelong learning in the context of technological change.

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Subject:-Theory of Computation **Subject Code: BTCOC502**

Course Outcomes (COs):-

Upon completion of this course, students will be able to	
C1	Construction of DFA, NFA and ϵ-NFA and regular expressions for the languages, Understand the concept of converting NFA to DFA, ϵ-NFA to DFA, automata to regular expressions and regular expression to automata, Remembering pumping lemma for regular languages and context free languages.
C2	Construct a CFG and parse trees.
C3	Construct a CFL and Their Conversions.
C4	Construct a PDA, Understand the concepts of converting grammar to PDA and PDA to grammar
C5	Understand the working principles of Turing Machine and post correspondence problem

CO-PO-PSO Mapping:-

CO	PO												PSO		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1	3	1										1		1	
CO2	1		2									1		1	
CO3	1													2	
CO4	2	2										1		2	
CO5	2	1										1		2	
Avg.	1.8	1.3	2									1		1.6	

CO-PO Mapping Justification:-

CO No	PO/PSO	CL	JUSTIFICATION
1	PO1	3	Basic Mathematics knowledge such as set theory, relations, functions and proof methods (induction, deduction, and contradiction) are used for verification of properties. Apply theory and principles of computer science engineering to solve an engineering problem
	PO2	1	Classification of real world problems such as lexical analyzers, compilers, network protocols, signaling systems etc and then accordingly providing appropriate design
	PO12	1	Describe requirement for continuing professional development.
	PSO2	1	The skills of designing Finite state machines are relevant to design secure network systems.
2	PO1	1	Apply theory and principles of computer science engineering to solve an engineering problem.
	PO3	2	Identify suitable criteria for evaluation of alternate design solutions and Demonstrate an ability to advance an engineering design to defined end state
	PO12	1	Describe requirement for continuing professional development.
	PSO2	1	The skills of designing Finite state machines are relevant to design secure network systems.
3	PO1	1	Apply theory and principles of computer science engineering to solve an engineering problem.
	PSO2	2	The skills of designing Finite state machines are relevant to design secure network systems.
4	PO1	2	Apply theory and principles of computer science engineering to solve an engineering problem
	PO2	2	Identify the mathematical, engineering and other relevant knowledge that applies to a given problem and Apply engineering mathematics and computations to solve mathematical problems
	PO12	1	Describe requirement for continuing professional development.
	PSO2	2	The skills of designing Finite state machines are relevant to design secure network systems.
5	PO1	2	Apply theory and principles of computer science engineering to solve an engineering problem.
	PO2	1	Classification of real world problems such as signaling systems, and then accordingly providing appropriate design
	PO12	1	Describe requirement for continuing professional development.
	PSO2	2	The skills of designing Finite state machines are relevant to design secure network systems.

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Subject:- Software Engineering **Subject Code: BTCOC503**

Course Outcomes (COs):-

	Upon completion of this course Student should be able to
CO1	Understand knowledge of basic Software engineering methods and practices, and their appropriate applications
CO2	Apply the agile methodologies to development of software
CO3	Apply the varies software system modeling techniques at the time of development of software
CO4	Apply design and implementation methods to each respective model
CO5	Apply the testing strategies to developed software/model for check it is working or some issues are occurred

CO-PO Mapping:-

CO	PO												PSO		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1	3												2		
2		3													2
3		3													2
4		3													2
5									3						2

CO-PO Mapping Justification:-

CO No	PO/PSO	CL	JUSTIFICATION
1	PO 1	3	Strongly mapped as Provide knowledge of basic Software engineering methods and practices, and their appropriate applications.
	PSO 1	2	Medium mapped as students will have the knowledge software engineering and its applications, and process methods
2	PO2	3	Strongly mapped as students will apply various Agile technologies at the time of development of Software OR any model with quickly and less time duration
	PSO3	2	Slightly mapped as students apply the agile methodology as well as traditional software engineering methods for development of software.
3	PO2	3	Strongly mapped as students will apply system modeling methods to describe all details with each model
	PSO3	2	Moderately mapped as students develop the ability to analyze, design the software
4	PO2	3	Strongly mapped as students will apply various methods for quality control and how to ensure good quality software
	PSO3	2	Moderately mapped as students build the role of project management in planning, scheduling, risk management, different software architectural styles, implementation issues
5	PO9	3	Strongly mapped as students will apply the software testing approaches such as unit testing and integration testing and understanding of software evolution and related issues such as version management
	PSO3	2	Moderately mapped as students search the some ethical and professional issues that are important for software engineers and development of significant teamwork and project-based experience

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Subject: - Human Computer Interaction **Subject Code: BTCOE504**

Course Outcomes (COs):-

CO	DESCRIPTION (Student should be able to...)
1	Students should able to identify how to design the user-friendly interface and systems
2	Students should able to design the system that resolves the issues related to privacy, security and social responsibility of the user
3	Students should able to make changes in the design as per the requirement
4	Students should able to grasp fundamental concepts and principles in HCI such as user behaviour, interface design & making use of different models to address the design challenges
5	Students should able to understand the technology that seamlessly blends with our everyday lives & enhances interaction with digital world

CO-PO Mapping:-

CO	PO												PSO		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
1		2										2			3
2						3									
3		3										3			
4			3									3			2
5			3												3

CO-PO Mapping Justification:-

CO No	PO/PSO	CL	JUSTIFICATION
1	PO2	2	Moderately mapped because students are able to identify the user needs to make the design user friendly
	PO12	2	Moderately mapped because students are recognizing the needs of user
	PSO3	3	Strongly mapped because students are able to analyze, design and implement software products
2	PO6	3	Strongly mapped because students are Understanding the need of authentication to the system
3	PO3	2	Moderately mapped because students are understanding the need of changes in development cycle
	PO12	3	Strongly mapped because students are understanding how the changes in development are important for a good quality software
4	PO3	2	Moderately mapped because Students are understanding different design models used for design process of any system
	PO12	3	Strongly mapped because students are Learning different design models to be used to design the user centric system design
	PSO3	2	Moderately mapped because students are able to analyze, design and implement software products
5	PO3	3	Strongly mapped because students are using different modern technologies and resources to interact with digital world
	PSO3	3	Strongly mapped because students are able to analyze, design and implement software products

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Subject:-Business Communication **Subject Code: BTHM505**

Course Outcomes (COs):-

CO	DESCRIPTION (Student should be able to...)
1	Demonstrate the ability to communicate clearly and concisely in both written and verbal formats.
2	Develop proficiency in using appropriate business communication tools and technologies.
3	Craft persuasive and informative business documents suitable for various audiences and purposes.
4	Exhibit effective interpersonal communication skills, including active listening and empathetic communication.
5	Collaborate with team members, demonstrating the ability to resolve conflicts and build positive working relationships.

CO-PO Mapping:-

CO	PO												PSO		
	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO1								2		3		3			
CO2					3						2				
CO3									2	3		3			
CO4								3		3		3			
CO5									2		3	3			
Avg.					3			2.5	2	3	2.5	3			

CO-PO Mapping Justification:-

CO	PO/PSO	CL	JUSTIFICATION
1	PO 8	3	This PO emphasizes the importance of communication skills, including verbal, written, and listening skills.
	PO 10	3	This PO emphasizes the to engage in independent and life-long learning in the broadest context of technological change.
	PO 12	2	Demonstrating leadership qualities is related to ethical awareness, as leaders often need to make ethical decisions.
2	PO5	3	In the context of business communication, the ability to create, select, and apply modern engineering and IT tools, as well as prediction and modeling techniques. This skill set empowers professionals to analyze and present complex information effectively, facilitating informed business strategies. Understanding the limitations of these tools ensures responsible and accurate communication of results.
	PO 11	2	Effective communication involves adapting to the audience, and this aligns with the emphasis on communication skills.
3	PO9	2	The ability to function effectively both as an individual and within diverse teams is vital. Effective communication skills enable individuals to collaborate seamlessly within multidisciplinary settings, promoting the exchange of ideas, fostering innovation, and ultimately driving successful outcomes in complex business scenarios.
	PO10	3	This PO emphasizes the importance of communication skills, including verbal, written, and listening skills.
	PO12	3	This PO emphasizes the to engage in independent and life-long learning in the broadest context of technological change.
4	PO8	3	: In the domain of business communication, adhering to ethical principles and professional responsibilities is essential. Upholding ethical standards ensures honest and transparent communication, fostering trust among stakeholders and maintaining the integrity of business relationships.
	O10	2	This PO emphasizes the importance of communication skills, including verbal, written, and listening skills.
	PO12	1	This PO emphasizes the to engage in independent and life-long learning in the broadest context of technological change.
5	PO9	3	The ability to function effectively both as an individual and within diverse teams is vital. Effective communication skills enable individuals to collaborate seamlessly within multidisciplinary settings, promoting the exchange of ideas, fostering innovation, and ultimately driving successful outcomes.
	PO11	1	Applying these principles helps in resource allocation, budgeting, and risk assessment, ensuring that communication efforts align with organizational goals and deliver measurable outcomes.

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Subject: Mini Project-1 **Subject Code: BTCOM507**

Course Outcomes (COs):-

CO	DESCRIPTION (Student should be able to...)
1	Students will be able to practice acquired knowledge within the chosen area of technology for project development.
2	Identify, discuss and justify the technical aspects of the chosen project with a comprehensive and systematic approach.
3	Reproduce, improve and refine technical aspects for report writing using latex
4	Work as an individual or in a team in development of technical projects.
5	Communicate and report effectively project related activities and findings

CO-PO Mapping:-

CO	PO												PSO		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**1**	**2**	**3**
1	3		2												
2		3				2									
3										**3**					
4									**2**		**3**				
5												**3**			

CO-PO Mapping Justification:-

CO	Justification of mapping		
	1: Slight (Low)	**2: Moderate (Medium)**	**3: Substantial (High)**
1		Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety, and cultural, societal, and environmental considerations.	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems
2		Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to professional engineering practice.	Identify, formulate, review research literature, and analyze complex engineering problems, reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3			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.
4		Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.	
5			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.