

Sinhgad Technical Education Society's

NBN SINHGAD TECHNICAL INSTITUTES CAMPUS RN SINHCAD SCHOOL OF ENGINEERING

Approved by AICTE, New Delhi, Recognized by Government of Maharashtra & Affiliated to Savitribai Phule Pune University (ID No. - PU/PN/Engg/432/2012)

S. No. 10/1, Ambegaon (Budruk), Off Sinhgad Road, Pune 411041

PTel.:+91-20-24355042 / 46, +91-20-24610880/881 ● Tele Fax:+91-20-24355042 ● Website:www.sinhgad.edu ● Email:nbnssoe@sinhgad.edu

DEPARTMENT OF COMPUTER ENGINEERING

VISION

उत्तमपुरुषान् उत्तमाभियंतृन् निर्मातुं कटीबध्दाः वयम्।

We are committed to produce not only good engineers but good human beings, also.

MISSION

"Holistic development of students and teachers is what we believe in and work for. We strive to achieve this by imbibing a unique value system, transparent work culture, excellent academic and physical environment conducive to learning, creativity and technology transfer. Our mandate is to generate, preserve and share knowledge for developing a vibrant society".



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DEPARTMENT OF COMPUTER ENGINEERING

PROGRAMME OUTCOMES

The graduates of Computer Engineering will be able to:

PO1	Engineering knowledge	Apply the knowledge of mathematics, science, Engineering fundamentals, and an Engineering specialization to the solution of complex Engineering problems.
PO2	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.
PO3	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.
PO4	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.
PO5	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.
PO6	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.
PO7	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.
PO8	Ethics	Apply ethical principles and commit to professional ethics and responsibilities and norms of the Engineering practice.
PO9	Individual and Team Work	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	Communication Skills	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.



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DEPARTMENT OF COMPUTER ENGINEERING

		Demonstrate knowledge and understanding of the
		Engineering and management principles and
PO11	Project Management and Finance	apply these to one's own work, as a member and
		leader in a team, to manage projects and in
		multidisciplinary Environments.
		Recognize the need for, and have the preparation
PO12	Life-long Learning	and ability to engage in independent and life-long
		learning in the broadest context of technological
		change.



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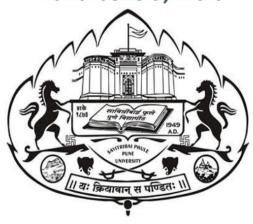
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DEPARTMENT OF COMPUTER ENGINEERING

PROGRAMME SPECIFIC OUTCOMES

PSO1	Professional Skills -The ability to understand, analyze and develop computer programs in the areas related to algorithms, system software, multimedia, web design, big data analytics, and networking for efficient design of computer-based systems of varying complexities.
PSO2	Problem-Solving Skills - The ability to apply standard practices and strategies in software project development using open-ended programming environments to deliver a quality product for business success.
PSO3	Successful Career and Entrepreneurship - The ability to employ modern computer languages, environments, and platforms in creating innovative career paths to be an entrepreneur, and a zest for higher studies.

Faculty of Science and Technology Savitribai Phule Pune University Maharashtra, India



Curriculum for Second Year of Computer Engineering (2019 Course) (With effect from 2020-21)

Savitribai Phule Pune University Second Year of Computer Engineering (2019 Course) (With effect from Academic Year 2020-21)

Semester-III

Course		Teach	ning Sc	heme	Exan	ninati	on Sch	eme	and N	/larks					
Code	Course Name	(Ho	urs/W	eek)								Cre	edit		
		Theory	Practical	Tutorial	Mid-Sem	End-Sem	ML M	PR	OR	Total	¥	A.	12	Total	
210241	Discrete Mathematics	03	10	01	30	70	12	70	100	100	03		01	04	
210242	<u>Fundamentals of Data</u> <u>Structures</u>	03	-	_	30	70	-	-	:22	100	03	-	-	03	
210243	Object Oriented Programming	03	-	-	30	70	-	-	7=	100	03	-	-	03	
210244	Computer Graphics	03	-	-	30	70	-	-	-	100	03	-	-	03	
210245	Digital Electronics and Logic Design	03	30=5	5. 5	30	70	1.00	-	3. -	100	03	-	3. 5 5	03	
210246	Humanity and Social Science	-	-	01	-	-	-	-	-	-	-	-	-	-	
210247	Data Structures Lab	100	04	-	7/2	202	25	50	194	75	19-3	02	79-2	02	
210248	OOP and Computer Graphics Lab	12	04	=	**	-	25	50	-	75	7/2	02	-	02	
210249	Digital Electronics Lab	-	02	-	-	-	25	-	5-0	25	-	01	-	01	
210250	Business Communication Skills Lab	-	02	-	-	1-	25	-	-	25	-	01	-	01	
210251	Audit Course 3	10-	3.5	30=0	355	35=3	1	3.5). 	30=	30=3	355	3.=	-	
								Т	otal	Credit	15	06	01	22	
	Total	15	12	02	150	350	100	100	100	700	100	100	100	10-0	

Semester-IV

Course			_		Exan	ninatio	on Sch	eme	and N	/larks				
Code	Course Name	(Hou	urs/W	eek)								Cre	dit	
		Theory	Practical	Tutorial	Mid-Sem	End-Sem	WL	PR	OR	Total		PR	<u>1</u> 01	Total
210252	Mathematics III	03	-	01	30	70	-	-	-	100	03		01	04
210253	<u>Data Structures and</u> <u>Algorithms</u>	03	-	-	30	70	-	-	-	100	03	-	-	03
210254	Software Engineering	03	-	-	30	70	-	-	-	100	03	-	-	03
210255	Microprocessor	03		3.5	30	70	3.5	3.00	3(=)	100	03	3.00	3.75	03
210256	Principles of Programming Languages	03	-	-	30	70	-	-	-	100	03	-	-	03
210257	<u>Data Structures and</u> <u>Algorithms Lab</u>	-	04	-	-	-	25	50	-	75	-	02	-	02
210258	Microprocessor Lab	-	04	-	-	_	25	50	-	75		02	-	02
210259	Code of Conduct	100	_	01	792		_		72	-		-	_	-
210260	Project Based Learning	-	04	-	-	-	50	-	-	50	-	02	-	02
210261	Audit Course 4	-	-	-	-	-	-	-	-	-	-	-	-	-
					Total Credit 1							06	01	22
	Total	15	12	02	150	350	100	100	3.=3	700	-	-	-	3-

Savitribai Phule Pune University Second Year of Computer Engineering (2019 Course) 210241: Discrete Mathematics

Credit **Examination Scheme:** Teaching Scheme: 03 Hours/Week Mid_Semester(TH): 30 Marks End_Semester(TH): 70 Marks 01 Hours/Week

Prerequisite Courses, if any: Basic Mathematics

Companion Course, if any:

Course Objectives:

- To use appropriate set, function and relation models to understand practical examples, and interpret the associated operations and terminologies in context.
- Determine number of logical possibilities of events.
- Learn logic and proof techniques to expand mathematical maturity.
- Formulate problems precisely, solve the problems, apply formal proof techniques, and explain the reasoning clearly.

Course Outcomes:

On completion of the course, learner will be able to-

- CO1: Design and analyze real world engineering problems by applying set theory, propositional logic and mathematical induction
- CO2: Develop skill in expressing mathematical properties of relation and function
- CO3: Identify number of logical possibilities of events to design professional engineering Solutions
- CO4: Model and solve computing problem using tree and graph Analyze the properties of binary operations and evaluate the algebraic structure
- CO5: Apply abstract algebra in combinatorics, coding theory and questions regarding geometric constructions



SINHGAD TECHNICAL EDUCATION SOCIETY'S

NBN SINHGAD TECHNICAL INSTITUES CAMPUS NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41

DEPARTMENT OF COMPUTER ENGINEERING

Course Articulation Matrix															
Course Title:	Discre	te Mat	hemati	cs						,	SPPU (Course	Code:	21024	l
Designation of Course: Professional															
Class: SE Computer Semester: III AY: 2021 - 22													22		
Teaching Scheme: Theory 3 Lectures/ week															
Assessment Tool	Assessment Tool Internal Assessment Tool External Assessment Tool														
Theory Unit Test Assignment / Tuto Prelim Exam Online / Insem Endsem													1		
Practical / Tutorial TW OR PR															
CO - PO Mappi	CO - PO Mapping														
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
210241 CO1	3	3	3	2	-	-	-	-	-	-	-	-	2	-	_
210241 CO2	3	3	3	2	-	-	-	-	-	-	-	-	1	1	1
210241 CO3	3	3	3	2	-	-	-	-	-	-	-	-	1	_	-
210241 CO4	3	3	3	2	-	-	-	-	-	-	-	-	3	-	-
210241 CO5	3	3	3	2	-	-	-	-	-	-	-	-	1	1	-
210241 CO6	3	3	3	2	-	-	-	-	-	-	-	-	1	-	-
210241	3.00	3.00	3.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	1.00	1.00
CO- PO mapping	is done	with c	orelatio	n level	1, 2, 3	and —	_		Evaluate			m's Tax			

- 1 : Slightly (low)
- 2: Moderately (Medium)
- 3 : Substantionally (High)
 - -: No corelation between CO and PO

ame Course Co-ordinator

Res Program Co-ordinator

Savitribai Phule Pune University Second Year of Computer Engineering (2019 Course) 210242: Fundamentals of Data Structures

Teaching Scheme: Credit **Examination Scheme:** TH: 03 Hours/Week 03 Mid_Semester(TH): 30 Marks End_Semester(TH): 70 Marks

Prerequisite Courses, if any: 110005: Programming and Problem Solving

Companion Course, if any: 210247: Data Structures Laboratory

Course Objectives:

- To understand the basic techniques of algorithm analysis.
- To understand various algorithmic strategies to approach the problem solution.
- To understand the memory requirement for various data structures.
- To understand various data searching and sorting methods with pros and cons.
- To acquaint with the structural constraints and advantages in usage of the data.
- To understand the standard and abstract data representation methods.
- To identify the appropriate data structure and algorithm design method for a specified application.

Course Outcomes:

- CO1: To demonstrate a detailed understanding of behaviour of data structures like array, linked list, stack, and queue by developing programs.
- CO2: To use appropriate algorithmic strategy for better efficiency
- CO3: To summarize data searching and sorting techniques.
- CO4: To discriminate the usage of various structures in approaching the problem solution.
- CO5: To analyze and use effective and efficient data structures in solving various Computer Engineering domain problems.
- CO6: To design the algorithms to solve the programming problems.



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DEPARTMENT OF COMPUTER ENGINEERING

	Course Articulation Matrix																
Course Title:	Funda	menta	ls of Da	ata Stri	ictures				SPPU Course Code: 210242								
Designation of C	ourse:	Core S	Subject	s													
Class: SE Co	mputer	r		Sen	Semester: SE Computer AY: 2021 - 22						22						
Teaching Schem	Teaching Scheme: Theory 3 Lectures/ week																
Assessment Tool Internal Assessment Tool External Assessment Tool																	
Theory		Unit	Test	Assign	nment	/ Tuto	Prelim	Exam	n Online / Insem Endsem					n			
Practical / Tutor	ial	Т	w						TW OR			R	P	R			
CO - PO Mappi	ng																
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
210242 CO1	3	3	2	2	_	_	_	_	_	_	_	_	3	_	_		
210242 CO2	1	2	2	3	_	_	_	_	_	_	_	_	3	2	1		

CO/PO	POI	PO2	PO3	PO4	PO5	PO6	PO/	PO8	PO9	POI	POII	PO12	PSOI	PSO2	PSO3
210242 CO1	3	3	2	2	_	_	_	_	_	_	_	_	3	_	_
210242 CO2	1	2	2	3	_	_	_	_	_	_	_	_	3	2	1
210242 CO3	3	1	2	2	_	_	_	_	_	_	_	_	1	_	_
210242 CO4	3	3	3	3	_	_	_	_	_	_	_	_	1	_	_
210242 CO5	2	3	3	3	_	_	_	_	_	_	_	_	1	1	_
210242 CO6	1	2	3	3	_	_	_	_	_	_	_	_	1	_	_
210242	2.17	2.33	2.50	2.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.67	1.50	1.00

CO- PO mapping is done with corelation level 1, 2, 3 and —

- 1 : Slightly (low)
- 2: Moderately (Medium)
- 3 : Substantionally (High)
- : No corelation between CO and PO



am Course Co-ordinator

Director / Principal

Savitribai Phule Pune University Second Year of Computer Engineering (2019 Course) 210243: Object Oriented Programming

Teaching Scheme:	Credit	Examination Scheme:
TH: 03 Hours/Week	03	Mid_Semester(TH): 30 Marks End_Semester(TH): 70 Marks

Prerequisite Courses, if any: Good understanding of Programming and Problem Solving concepts

Companion Course, if any:

Course Objectives:

- To explore & understand the principles of Object Oriented Programming (OOP).
- · To use the object-oriented paradigm in program design.
- To provide object-oriented programming insight using C++
- · To lay a foundation for advanced programming.

Course Outcomes:

On completion of the course, learner will be able to-

CO1: Analyze the strengths of object oriented programming

CO2: Design and apply OOP principles for effective programming

CO3: Develop the application using object oriented programming language(C++)

CO4: Apply object-oriented concepts for advanced programming.



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NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41

DEPARTMENT OF COMPUTER ENGINEERING

	Course Articulation Matrix																
Course Title:	Object	t Orien	ted Pr	ogramı	ning (C	OOP)			SPPU Course Code: 210243								
Designation of C	ourse:		Core S	Subject	s												
Class:	SE Co	mpute	r					Sen	ester:	Ш			AY:	2021 -	22		
Teaching Scheme																	
Assessment Tool	•																
Theory		Unit	Test	Assig	nment	/ Tuto	Prelim	Exam	(Online	/ Insen	n]	Endsen	ı		
Practical / Tutor	ial	T	W						T	W	0	R	P	R			
CO - PO Mappi	ng																
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3		
210243 CO1	2	1	1	1	-	-	-	-	-	-	-	-	1	-	-		
210243 CO2	2	2	3	2	-	-	-	-	-	-	-	-	1	_	1		
210243 CO3	2	2	3	2	-	-	-	-	-	-	-	-	1	-	-		
210243 CO4	3	3	3	2	-	-	-	-	-	-	-	-	1	-	-		
210243 CO5	-	-	-	-	-	-	-	-	-	-	-	-	1	1	-		
210243 CO6	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-		
210243	2.25	2.00	2.50	1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00		
CO- PO mapping is done with corelation level 1, 2, 3 and —																	
1 : Slightly (low) 2 : Moderately (1			orciano	ni ievei	1, 2, 3	ciii.			-		ENALUATE ANALYSE	Character and Control	er conjunter droit r drobitom trai pulps oriest to	op, formulate, autros, pport, value, critique, o es an, corrient, distingui			



3 : Substantionally (High)

: No corelation between CO and PO



Savitribai Phule Pune University Second Year of Computer Engineering (2019 Course) 210244: Computer Graphics Teaching Scheme: Credit **Examination Scheme:** TH: 03 Hours/Week 03 Mid Semester(TH): 30 Marks End_Semester(TH): 70 Marks

Prerequisite Courses, if any:

Companion Course, if any: OOP

Course Objectives:

- Remembering: To acquaint the learner with the basic concepts of Computer Graphics
- Understanding: To learn the various algorithms for generating and rendering graphical figures.
- Applying: To get familiar with mathematics behind the graphical transformations
- Understanding: To understand and apply various methods and techniques regarding projections, animation, shading, illumination and lighting
- Creating: To generate Interactive graphics using OpenGL

Course Outcomes:

On completion of the course, learner will be able to-

- CO1: Define basic terminologies of Computer Graphics, interpret the mathematical foundation of the concepts of computer graphics and apply mathematics to develop Computer programs for elementary graphic operations.
- CO2: Define the concept of windowing and clipping and apply various algorithms to fill and clip polygons.
- CO3: Explain the core concepts of computer graphics, including transformation in two and three dimensions, viewing and projection.
- CO4: Explain the concepts of color models, lighting, shading models and hidden surface elimination.
- CO5: Describe the fundamentals of curves, fractals, animation and gaming.



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Course Articulation Matrix															
Course Title:	Comp	uter G	raphics	5							SPPU	Course	Code:	210244	4
Designation of Course: Core Subjects															
Class: SE Computer Semester: III AY: 2021 - 22													22		
Teaching Schem	Teaching Scheme														
Assessment Tool Internal Assessment Tool External Assessment Tool															
Theory Unit Test Assignment / Tuto Prelim Exam Online / Insem Endsem														n	
Practical / Tutorial TW OR PR															
CO - PO Mappi	CO - PO Mapping														
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
210244 CO1	2	1	1	-	-	-	-	-	-	-	-	-	1	_	-
210244 CO2	1	2	-	-	-	-	-	-	-	-	-	-	1	_	1
210244 CO3	2	1	1	-	-	-	-	-	-	-	-	-	1	_	-
210244 CO4	1	-	1	-	-	-	-	-	-	-	-	-	1	_	-
210244 CO5	-	2	2	1	-	-	-	-	-	-	-	-	1	1	-
210244 CO6	-	1	-	-	-	-	-	-	-	-	-	-	1	_	-
210244	1.50	1.50	1.25	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00
Evaluatation of 60 with P0 and P50 on 3 point scale using Bioom's Taxonomy Bloom's Taxonomy															
CO- PO mapping	CO- PO mapping is done with corelation level 1, 2, 3 and —														
1 : Slightly (low)	1 : Slightly (low)														

2 : Moderately (Medium)

3 : Substantionally (High)

- : No corelation between CO and PO

AKS_

agre Course Co-ordinator

Program Co-ordinator

210245: Digital Electronics and Logic Design

	Teaching Scheme:	Credit	Examination Scheme:
TH:	03 Hours/Week	03	Mid_Semester(TH): 30 Marks
			End Semester(TH): 70 Marks

Prerequisite Courses, if any: 104010 Basic Electronics Engineering

Companion Course, if any: 210249 Digital Electronics Lab

Course Objectives:

- · To study number systems and develop skills for design and implementation of combinational logic circuits and sequential circuits
- · To understand the functionalities, properties and applicability of Logic Families.
- To introduce programmable logic devices and ASM chart and synchronous state machines.
- · To basics of microprocessor.

Course Outcomes:

On completion of the course, learner will be able to-

- CO1: Simplify Boolean Expressions using K Map.
- CO2: Design and implement combinational circuits.
- CO3: Design and implement sequential circuits.
- CO4: Develop simple real-world application using ASM and PLD.
- CO5: Choose appropriate logic families IC packages as per the given design specifications.
- CO6: Explain organization and architecture of computer system



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					~	A42	14	1/-	4						
Course Title:	Digita	l Electi	ronics a				сшапо	on Ma	urix	:	SPPU	Course	Code:	21024	5
Designation of C	ourse:	Core S	Subject	S											
Class: SE Co	mputer							Sen	nester:	Ш			AY:	2021 -	22
Teaching Schem	e														
Assessment Tool	l		In	ternal .	Assessi	nent T	ool			Ex	ternal	Assessi	ment T	ool	
Theory		Unit	Test	Assign	nment	/ Tuto	Prelim	Exam		Online	/ Insen	n	1	Endsen	n
Practical / Tutor	ial	Т	W		Т	W	О	R	P	R					
CO - PO Mappi	ng														
CO/PO	PO1	PO2	PO3	PO4	PO8	PO9	PO10	PO11	PO12	PSO1	PSO ₂	PSO3			
210245 CO1	3	-	2	-	-	-	-	-	-	-	-	-	1	_	_
210245 CO2	3	1	3	-	-	-	-	-	-	-	-	-	1	_	1
210245 CO3	3	1	3	-	-	-	-	-	-	-	-	-	1	_	_
210245 CO4	3	-	2	1	-	-	-	-	-	-	-	-	1	_	-
210245 CO5	3	2	-	-	-	-	-	-	-	-	-	-	1	1	-
210245 CO6	3	-	-	-	-	-	-	-	-	-	-	-	1	_	-
210245	3.00	1.33	2.50	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00
	•		•			-			Evaluati	ation of 60 wi		o on a point o		loom's Taxon	renty.
CO- PO mapping	is done	with c	orelatio	n level	1, 2, 3	and —	-		_		CREATE D	noduce new or only	prod work	ton formulate suffer	translates
1 : Slightly (low)										1	ENALUATE		eteral judge, orient, su	apport, salvan, critiques	suringin
2 : Moderately (1	Mediun	1)							1		WHATABE	differentials.	entitions arrowing tole organization misses com- quisition, tool formation in mass o	are contact datings	sub, examine.
3 : Substantionall	y (High)							0		UNDERSTAND	STANDAY STANDAY	in change the court of	er demonstrate, many	en comme.
- : No corelation			and PO)					1		REMEMBER	2	Recell facts and	I best concepts	



Savitribai Phule Pune University Second Year of Engineering (2019 Course) 210253: Data Structures & Algorithms

	Teaching Scheme:	Credit	Examination Scheme:
TH:	03 Hours/Week	03	Mid_Semester(TH): 30 Marks
			End Semester(TH): 70 Marks

Prerequisite Courses, if any:

- Fundamentals of Data Structure
- Basic Mathematics, Geometry, linear algebra, vectors and matrices

Companion Course, if any:

Course Objectives:

- To develop a logic for graphical modeling of the real life problems.
- · To suggest appropriate data structure and algorithm for graphical solutions of the problems.
- To understand advanced data structures to solve complex problems in various domains.
- To operate on the various structured data
- To build the logic to use appropriate data structure in logical and computational solutions.
- To understand various algorithmic strategies to approach the problem solution.



SINHGAD TECHNICAL EDUCATION SOCIETY'S NBN SINHGAD TECHNICAL INSTITUES CAMPUS NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41 DEPARTMENT OF COMPUTER ENGINEERING

				(Course	Artic	culatio	on Ma	trix						
Course Title:	Data S	tuctur	es and	Algori	thms						SPPU (Course	Code:	21025	3
Designation of C	ourse:	Core S	Subject	s											
Class: SE Co	mputer							Sen	ester:	IV			AY:	2021 -	22
Teaching Schem	e														
Assessment Tool Internal Assessment Tool External Assessment Tool															
Theory Unit Test Assignment / Tuto Prelim Exam Online / Insem Endsem															
Practical / Tutorial TW OR PR															
CO - PO Mapping CO / PO															
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
210253 CO1	3	1	3	1	_	-	_	_	1	_	_	1	1	_	-
210253 CO2	3	2	3	1	-	-	_	-	1	-	_	-	3	1	1
210253 CO3	3	2	3	1	-	-	_	-	1	-	-	-	3	2	1
210253 CO4	3	2	3	1	1	-	_	-	1	-	-	-	3	2	1
210253 CO5	3	2	3	1	1	-	_	_	1	-	-	1	3	1	1
210253 CO6	3	2	3	1	1	-	-	-	1	-	-	1	3	2	1
210253	2.00	2.00	2.00	1.00	3.00	3.00	3.00	1.00	1.00	1.00	1.00	2.00	3.00	2.00	1.00
CO. PO manning			1-4		1 2 2	,			Evaluate	ition of 60 w		om 3 point om's Tax	onomy	loom's Taxone	eny.

CO-PO mapping is done with corelation level 1, 2, 3 and —

- 1 : Slightly (low)
- 2 : Moderately (Medium)
- 3 : Substantionally (High)
- : No corelation between CO and PO

Course Co-ordinator

SES-Program Co-ordinator

Savitribai Phule Pune University Second Year of Engineering (2019 Course) 210254: Software Engineering

ı	Teaching Scheme:	Credit	Examination Scheme:
ľ	TH: 03 Hours/Week	03	Mid_Semester(TH): 30 Marks
ı			End Semester(TH): 70 Marks

Prerequisite Courses, if any: Fundamentals of Programming Languages

Companion Course, if any:

Course Objectives:

- · To learn and understand the principles of Software Engineering.
- To be acquainted with methods of capturing, specifying, visualizing and analyzing software requirements.
- To apply Design and Testing principles to S/W project development.
- To understand project management through life cycle of the project.

Course Outcomes:

- CO1: Apply software engineering principles to develop software.
- CO2: Analyze software requirements and formulate design solution for a software.
- CO3: Explain concepts of project estimation, planning and scheduling.
- CO4: Explain risk management and software configuration management.
- CO5: Explain various types of software testing.



SINHGAD TECHNICAL EDUCATION SOCIETY'S NBN SINHGAD TECHNICAL INSTITUES CAMPUS NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41 DEPARTMENT OF COMPUTER ENGINEERING

				(Course	Artic	culatio	on Ma	trix						
Course Title:	Softwa	ire Eng	gineeri	ng							SPPU (Course	Code:	21025	4
Designation of C	ourse:	Core S	Subject	S											
Class: SE Co	mputer							Sem	ester:	IV			AY:	2021 -	22
Teaching Schem	e														
Assessment Tool Internal Assessment Tool External Assessment Tool															
Theory Unit Test Assignment / Tuto Prelim Exam Online / Insem Endsem															
Practical / Tutorial TW OR PR															
CO - PO Mappi	ing														
CO/PO	PO1	01 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 PSO1 PSO2 PSO3													
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210254 CO2	2	1	-	-	2	-	-	-	-	-	-	1	1	_	1
210254 CO3	2	-	-	-	1	-	-	-	1	-	1	-	1	_	-
210254 CO4	2	-	-	-	-	-	-	-	-	-	-	-	1	_	_
210254 CO5	2	-	-	-	1	-	-	-	-	-	-	1	1	1	-
210254 CO6	-	-	-	-	-	-	-	-	-	-	-	-	1	_	-
210254	2.00	1.00	0.00	0.00	1.33	0.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
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2: Moderately (Mediun	1)							8	-	AMALYEE		Automotion in new	allestion	sh marries.



3 : Substantionally (High)

-: No corelation between CO and PO

SES

Director / Principal

Savitribai Phule Pune University Second Year of Engineering (2019 Course)

210255: Microprocessor

Teaching Scheme:	Credit	Examination Scheme:
TH: 03 Hours/Week	03	Mid_Semester(TH): 30 Marks
		End_Semester(TH): 70 Marks

Prerequisite Courses, if any: Digital Electronics and Logic Design

Companion Course, if any:

Course Objectives:

- To learn the architecture and programmer's model of advanced processor
- To understand the system level features and processes of advanced processor
- To acquaint the learner with application instruction set and logic to build assembly language programs.
- To understand debugging and testing techniques confined to 80386 DX

Course Outcomes:

On completion of the course, student will be able to-

- CO1: To apply the assembly language programming to develop small real life embedded application.
- CO2: To understand the architecture of the advanced processor thoroughly to use the resources for programming
- CO3: To understand the higher processor architectures descended from 80386 architecture



SINHGAD TECHNICAL EDUCATION SOCIETY'S NBN SINHGAD TECHNICAL INSTITUES CAMPUS NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41 DEPARTMENT OF COMPUTER ENGINEERING

				(Course	Artic	culatio	on Ma	trix						
Course Title:	Micro	proces	sor								SPPU (Course	Code:	21025	5
Designation of C	ourse:	Core S	Subject	s											
Class: SE Co	mputer	-						Sen	nester:	IV			AY:	2021 -	22
Teaching Schem	e														
Assessment Tool			In	ternal .	Assessi	nent T	ool			Ex	ternal	Assessi	ment T	ool	
Theory Unit Test Assignment / Tuto Prelim Exam Online / Insem														Endsen	n
Practical / Tutor	ial	T	W	Т	w	О	R	P	R						
CO - PO Mapping															
CO/PO	PO1	PO2	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO ₃						
210255 CO1	2	2	2	2	2	-	-	-	2	2	2	-	1	_	_
210255 CO2	2	2	2	2	-	-	-	-	2	2	-	-	1	_	1
210255 CO3	2	2	1	1	-	-	-	-	2	1	-	-	1	_	_
210255 CO4	2	2	2	2	-	-	-	-	2	2	-	-	1	_	_
210255 CO5	-	-	-	-	-	-	-	-	-	-	-	-	1	1	_
210255 CO6	-	-	-	-	-	-	-	-	-	-	-	-	1	_	_
210255	2.00	2.00	1.75	1.75	2.00	0.00	0.00	0.00	2.00	1.75	2.00	0.00	1.00	1.00	1.00
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CO- PO mapping	is done	with c	orelatio	n level	1, 2, 3	and —	-		_			obus me o origi	ral work	op. Formulate, author.	handan.
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2 : Moderately (Mediun	1)							1		AHALYBE	equitiness,		are content dutings	uh, mareine.
3 : Substantionall	y (High)							- 7		APPLY	suitedus Te	n. stantijk		
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Course Co-ordinator

SKS

Director / Principal

Savitribai Phule Pune University Second Year of Engineering (2019 Course) 210256: Principles of Programming Languages

Teaching Scheme: Credit Examination Scheme:

TH: 03 Hours/Week 03 Mid_Semester(TH): 30 Marks
End_Semester(TH): 70 Marks

Prerequisite Courses, if any: Fundamentals of Data Structures, Object Oriented Programming, Fundamentals of programming language.

Companion Course, if any: Software Engineering, Data Structures and Algorithms, Project based learning

Course Objectives:

- · To learn basic principles of programming languages and programming paradigms
- · To learn structuring the data and manipulation of data, computation and program structure
- · To learn Object Oriented Programming (OOP) principles using Java Programming Language
- · To learn basic concepts of logical and functional programming language

Course Outcomes:

On completion of the course, student will be able to-

- CO1: Make use of basic principles of programming languages
- CO2: Able to develop a program with Data representation and Computations
- CO3: Able to develop programs using Object Oriented Programming language : Java
- CO4: Develop application using inheritance, encapsulation, and polymorphism
- CO5: Able to demonstrate Applet and Multithreading for robust application development
- CO6: Able to develop a simple program using basic concepts of Functional and Logical programming paradigm



SINHGAD TECHNICAL EDUCATION SOCIETY'S NBN SINHGAD TECHNICAL INSTITUES CAMPUS NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41 DEPARTMENT OF COMPUTER ENGINEERING

				(Course	Artic	culatio	on Ma	trix						
Course Title:	Princi	ples of	Progra	mmin	g Lang	uages				:	SPPU (Course	Code:	210250	6
Designation of C	ourse:	Core S	Subject	s											
Class: SE Co	mputer	r						Sen	ester:	IV			AY:	2021 -	22
Teaching Schem	Teaching Scheme														
Assessment Tool Internal Assessment Tool External Assessment Tool															
Theory Unit Test Assignment / Tuto Prelim Exam Online / Insem Endsem															
Practical / Tutorial TW OR PR															
CO - PO Mapping CO / PO															
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
210256 CO1	3	2	2	2	2	1	-	1	2	-	1	3	1	_	-
210256 CO2	3	3	3	3	2	1	-	1	2	1	3	3	1	-	1
210256 CO3	3	3	3	3	3	2	1	3	2	1	3	3	1	-	-
210256 CO4	3	3	3	3	3	2	1	3	2	1	3	3	1	_	-
210256 CO5	3	3	3	3	3	2	1	3	2	1	3	3	1	1	-
210256 CO6	3	3	3	3	3	2	1	3	2	1	3	3	1	_	-
210256	3.00	2.83	2.83	2.83	2.67	1.67	1.00	2.33	2.00	1.00	2.67	3.00	1.00	1.00	1.00
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CO- PO mapping is done with corelation level 1, 2, 3 and -

- 1 : Slightly (low)
- 2 : Moderately (Medium)
- 3 : Substantionally (High)
 - : No corelation between CO and PO



Course Co-ordinator

RES_

210260: Project Based Learning

Teaching Scheme: Credit Examination Scheme: PR: 04 Hours/Week TW: 50 Marks

Prerequisite Courses, if any: Problem Based Learning.

Companion Course, if any: Software Engineering.

Course Objectives:

- · To develop critical thinking and problem solving ability by exploring and proposing solutions to realistic/social problem.
- To Evaluate alternative approaches, and justify the use of selected tools and methods,
- To emphasizes learning activities that are long-term, inter-disciplinary and student-centric.
- To engages students in rich and authentic learning experiences.
- To provide every student the opportunity to get involved either individually or as a group so as to develop team skills and learn professionalism.
- To develop an ecosystem this may promote entrepreneurship and research culture among the students.

Course Outcomes:

- CO1: Ability to solve real life problems by applying knowledge.
- CO2: Ability to analyze alternative approaches, apply and use most appropriate one for feasible solution.
- CO3: Ability to understand basics of IT Project management
- CO4: Students should be able to accept and meet challenges in the real world, mirroring what professionals do every day.
- CO5: Able to Classify software applications and identify unique features of various domains
- CO6: Learning by doing approach in PBL will promote long-term retention of material and replicable skill, as well as improve teachers' and students' attitudes towards learning.



SINHGAD TECHNICAL EDUCATION SOCIETY'S NBN SINHGAD TECHNICAL INSTITUES CAMPUS NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41 DEPARTMENT OF COMPUTER ENGINEERING

				(Course	Artic	culatio	on Ma	trix						
Course Title:	Projec	t Base	d Lear	ning II							SPPU (Course	Code:	21026	D
Designation of C	ourse:	Projec	t Worl	k.											
Class: SE Co	mputer							Sen	nester:	IV			AY:	2021 -	22
Teaching Schem	e														
Assessment Tool	l		In	ternal .	Assessi	nent T	ool			Ex	ternal	Assessi	ment T	ool	
Theory		Unit	Test		Online	/ Insen	n	1	Endsen	n					
Practical / Tutor		T	W	O	R	P	R								
CO - PO Mappi	ng														
CO/PO	PO1	PO2	PO3	PO4	PO8	PO9	PO10	PO11	PO12	PSO1	PSO ₂	PSO3			
210260 CO1	2	-	3	-	0	-	3	-	-	2	-	2	1	_	_
210260 CO2	3	2	3	-	2	2	-	-	2	-	-	-	1	-	1
210260 CO3	3	-	-	-	3	3	-	-	-	-	-	-	1	-	_
210260 CO4	3	-	-	-	0	2	-	-	-	-	-	-	1	-	_
210260 CO5	3	-	-	-	3	-	-	-	-	-	-	-	1	1	_
210260 CO6	3	-	2	-	3	-	3	-	-	-	-	-	1	_	_
210260	2.83	2.00	2.67	0.00	1.83	2.33	3.00	0.00	2.00	2.00	0.00	2.00	1.00	1.00	1.00
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CO- PO mapping	is done	with c	orelatio	n level	1, 2, 3	and —	-		_	_	CREATE D	oduce new or only	fruid reverb cost, competitions, drawn	tion forwards author	investigate
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- 2 : Moderately (Medium)
- 3 : Substantionally (High)
- : No corelation between CO and PO



agne Course Co-ordinator

Faculty of Science and Technology Savitribai Phule Pune University Maharashtra, India



Curriculum for

Third Year of Computer Engineering

(2019 Course) (With effect from 2021-22)

310241: Database Management Systems

Teaching Scheme: Credit: 03 Examination Scheme: Mid-Sem (TH): 30 Marks
Hours/Week End-Sem (TH): 70 Marks

Prerequisites Courses: Discrete Mathematics (210241), Data Structures and Algorithms (210252)

Companion Course: Database Management Systems Laboratory (310246)

Course Objectives:

- · To understand the fundamental concepts of Database Management Systems
- To acquire the knowledge of database query languages and transaction processing
- To understand systematic database design approaches
- To acquire the skills to use a powerful, flexible, and scalable general-purpose databases to handle Big Data
- To be familiar with advances in databases and applications

Course Outcomes:

On completion of the course, learners should be able to

CO1: Analyze and design Database Management System using ER model

CO2: Implement database queries using database languages

CO3: Normalize the database design using normal forms

CO4: Apply Transaction Management concepts in real-time situations

CO5: Use NoSQL databases for processing unstructured data

CO6: Differentiate between Complex Data Types and analyze the use of appropriate data types



SINHGAD TECHNICAL EDUCATION SOCIETY'S NBN SINHGAD TECHNICAL INSTITUES CAMPUS NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41 DEPARTMENT OF COMPUTER ENGINEERING

					Course	Artic	culatio	on Ma	trix						
Course Title:	Datab	ase Ma	nagem	ent Sys	stems						SPPU	Course	Code:	31024	l
Designation of C	ourse:	Core S	Subject	s											
Class: TE Co	mpute	r						Sen	nester:	\mathbf{V}			AY:	2021 -	22
Teaching Schem	e														
Assessment Tool	l		In	ternal .	Assessi	nent T	ool			Ex	ternal	Assessi	ment T	ool	
Theory Unit Test Assignment / Tuto Prelim Exam Online / Insem Endsem Practical / Tutorial TW OR PR															n
Practical / Tutor	W	O	R	P	R										
CO - PO Mapping															
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
310241 CO1	2	2	3	1	-	-	-	1	-	-	-	3	1	_	_
310241 CO2	-	2	3	-	-	2	-	-	-	-	-	3	1	_	1
310241 CO3	-	2	3	-	1	-	-	-	-	-	-	3	1	_	_
310241 CO4	2	2	2	2	-	-	-	-	-	1	-	3	1	-	_
310241 CO5	-	2	3	-	-	-	-	-	-	-	1	3	1	1	-
310241 CO6	2	2	-	-	-	-	1	-	2	-	1	1	1	_	_
310241	2.00	2.00	2.80	1.50	1.00	2.00	1.00	1.00	2.00	1.00	1.00	2.67	1.00	1.00	1.00
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- : No corelation between CO and PO

SES

Director / Principal

Home

310242: Theory of Computation

Teaching Scheme: Credit: 03 Examination Scheme: Mid-Sem (TH): 30 Marks Hours/Week End-Sem (TH): 70 Marks

Prerequisites Courses: Discrete Mathematics (210241)

Companion Course: --

Course Objectives:

- To introduce the students to basics of Theory of Computation
- To study abstract computing models to provide a formal connection between algorithmic problem solving and the theory of languages
- To learn Grammar, Pushdown Automata and Turing Machine for language processing and algorithm design
- To learn about the theory of computability and complexity for algorithm design

Course Outcomes:

After completion of the course, learners should be able to

- CO1: Understand formal language, translation logic, essentials of translation, alphabets, language representation and apply it to design Finite Automata and its variants
- CO2: Construct regular expression to present regular language and understand pumping lemma for RE
- CO3: Design Context Free Grammars and learn to simplify the grammar
- CO4: Construct Pushdown Automaton model for the Context Free Language
- CO5: Design Turing Machine for the different requirements outlined by theoretical computer science
- CO6: Understand different classes of problems, classify and analyze them and study concepts of NP completeness



SINHGAD TECHNICAL EDUCATION SOCIETY'S NBN SINHGAD TECHNICAL INSTITUES CAMPUS NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41

DEPARTMENT OF COMPUTER ENGINEERING

					Course	Artic	culatio	on Ma	trix						
Course Title:	Theor	y of Co	mputa	tion						,	SPPU	Course	Code:	310242	2
Designation of Co	ourse:	Core S	Subject	s											
Class: TE Con	mputei	r						Sem	nester:	\mathbf{V}			AY:	2021 -	22
Teaching Scheme	Teaching Scheme														
Assessment Tool Internal Assessment Tool External Assessment Tool															
Theory Unit Test Assignment / Tuto Prelim Exam Online / Insem Endsem															
Practical / Tutorial TW OR PR															
CO - PO Mappir	CO - PO Mapping														
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
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310242 CO2	3	3	2	2	1	-	-	-	-	-	-	1	1	_	1
310242 CO3	3	3	2	2	1	-	-	-	-	-	-	1	1	_	_
310242 CO4	3	3	2	2	1	-	-	-	-	-	-	1	1	_	_
310242 CO5	3	3	3	2	1	-	-	-	-	-	-	2	1	1	_
310242 CO6	3	3	3	3	1	-	-	-	-	-	-	1	1	_	_
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CO- PO mapping is done with corelation level 1, 2, 3 and —

- 1 : Slightly (low)
- 2 : Moderately (Medium)
- 3: Substantionally (High)
- : No corelation between CO and PO

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Bloom's Taxonomy

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Bloom's Taxonomy

CREATE Points were or original week

Section of CO with PO and P50 on 3 point scale using Bloom's Taxoneersy

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Section of CO with P50 on 3 poi

Course Co-ordinator

SES

Director / Principal

Savitribai Phule Pune University

Third Year of Computer Engineering (2019 Course)

310243: Systems Programming and Operating System

Examination Scheme: Teaching Scheme: Credit: 03 TH: 03 Mid-Sem (TH): 30 Marks Hours/Week End-Sem (TH): 70 Marks

Prerequisites Courses: Programming and Problem solving (110005), Data Structures and

Algorithms (210252), Principles of Programming Languages (210255), Microprocessor (210254)

Companion Course: Laboratory Practice I (310248)

Course Objectives:

- To get acquainted with the basics of System Programming
- · To acquire knowledge of data structures used in the design of System Software
- To be familiar with the format of object modules, the functions of linking, relocation, and loading
- To comprehend the structures and functions of Operating Systems and process management.
- To deal with concurrency and deadlock in the Operating System
- To learn and understand memory management of Operating System

Course Outcomes:

On completion of the course, learners should be able to

CO1: Analyze and synthesize basic System Software and its functionality.

CO2: Identify suitable data structures and Design & Implement various System Software

CO3: Compare different loading schemes and analyze the performance of linker and loader

CO4: Implement and Analyze the performance of process scheduling algorithms

CO5: Identify the mechanism to deal with deadlock and concurrency issues

CO6: Demonstrate memory organization and memory management policies



SINHGAD TECHNICAL EDUCATION SOCIETY'S

NBN SINHGAD TECHNICAL INSTITUES CAMPUS

NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41

DEPARTMENT OF COMPUTER ENGINEERING

Course Title:	Custon	as Duas						on Ma	trix		CDDII	Canna	Codo	31024	2
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Teaching Schem															
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310243 CO4	2	1	2	1	-	-	-	-	-	-	-	-	1	_	-
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Director / Principal

Course Co-ordinator

Savitribai Phule Pune University

Third Year of Computer Engineering (2019 Course)

310244: Computer Networks and Security

Teaching Scheme: Credit: 03 Examination Scheme: TH: 03

Mid-Sem (TH): 30 Marks Hours/Week End-Sem (TH): 70 Marks

Prerequisites Courses: -

Companion Course: Computer Networks and Security Laboratory (310247)

Course Objectives:

- To understand the fundamental concepts of networking standards, protocols and technologies
- To learn different techniques for framing, error control, flow control and routing
- To learn different layer protocols in the protocol stacks
- To understand modern network architectures with respect to design and performance
- To learn the fundamental concepts of Information Security

Course Outcomes:

On completion of the course, learners should be able to

CO1: Summarize fundamental concepts of Computer Networks, architectures, protocols and technologies

CO2: Illustrate the working and functions of data link layer

CO3: Analyze the working of different routing protocols and mechanisms

CO4: Implement client-server applications using sockets

CO5: Illustrate role of application layer with its protocols, client-server architectures

CO6: Comprehend the basics of Network Security



SINHGAD TECHNICAL EDUCATION SOCIETY'S NBN SINHGAD TECHNICAL INSTITUES CAMPUS NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41 DEPARTMENT OF COMPUTER ENGINEERING

				(Course	Artic	culatio	on Ma	trix						
Course Title:	Comp	uter No	etwork	s and S	ecurity	7				:	SPPU (Course	Code:	31024	4
Designation of C	ourse:	Core S	Subject	s											
Class: TE Co	mpute	r						Sem	nester:	\mathbf{V}			AY:	2021 -	22
Teaching Schem	e														
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310244 CO4	1	2	1	2	2	-	-	-	1	-	1	1	1	_	_
310244 CO5	1	3	-	-	1	-	1	1	-	-	-	-	1	1	_
310244 CO6	1	-	2	1	-	1	-	-	-	-	-	1	1	_	_
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2 : Moderately (Medium)

3 : Substantionally (High)

- : No corelation between CO and PO

Program Co-ordinator

agre Course Co-ordinator

Director / Principal

Home

Elective I



Examination Scheme: Teaching Scheme: Credit: 03 TH: 03 Mid-Sem (TH): 30 Marks Hours/Week End-Sem (TH): 70 Marks

Prerequisites Courses: Computer Networks and Security (310244)

Companion Course: Laboratory Practice I (310248)

Course Objectives:

- To understand fundamentals of Internet of Things (IoT) and Embedded Systems
- To learn advances in Embedded Systems and IoT
- · To learn methodologies for IoT application development
- To learn the IoT protocols, cloud platforms and security issues in IoT
- · To learn real world application scenarios of IoT along with its societal and economic impact using case studies and real time examples

Course Outcomes:

On completion of the course, learners should be able to

CO1: Understand the fundamentals and need of Embedded Systems for the Internet of Things

CO2: Apply IoT enabling technologies for developing IoT systems

CO3: Apply design methodology for designing and implementing IoT applications

CO4: Analyze IoT protocols for making IoT devices communication

CO5: Design cloud based IoT systems

CO6: Design and Develop secured IoT applications



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DEPARTMENT OF COMPUTER ENGINEERING

				(Course	Artic	culatio	on Ma	trix						
Course Title:	Intern	et of T	hings a	nd Em	bedde	l Syste	ms				SPPU (Course	Code:	310245	5 A
Designation of C	ourse:	Electiv	ve Suje	cts											
Class: TE Co	mpute	r						Sen	nester:	\mathbf{V}			AY:	2021 -	22
Teaching Schem	e														
Assessment Tool			In	ternal .	Assessr	nent T	ool			Ex	ternal	Assessi	ment T	ool	
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CO - PO Mappi	ng														
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2: Moderately (Medium)

3 : Substantionally (High)

- : No corelation between CO and PO

Director / Principal

Home

Course Co-ordinator

Savitribai Phule Pune University Third Year of Computer Engineering (2019 Course) 310246: Database Management Systems Laboratory

Home

Teaching Scheme

Practical: 04 Hours/Week

Credit Scheme: 02

Examination Scheme and Marks

Term work: 25 Marks Practical: 25 Marks

Companion Course: Database Management Systems (310241)

Course Objectives:

- To develop Database programming skills
- To develop basic Database administration skills
- To develop skills to handle NoSQL database
- To learn, understand and execute process of software application development

Course Outcomes:

On completion of the course, learners will be able to

CO1: Design E-R Model for given requirements and convert the same into database tables

CO2: Design schema in appropriate normal form considering actual requirements

CO3: Implement SQL queries for given requirements, using different SQL concepts

CO4: Implement PL/SQL Code block for given requirements

CO5: Implement NoSQL queries using MongoDB

CO6: Design and develop application considering actual requirements and using database concepts



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DEPARTMENT OF COMPUTER ENGINEERING

				_	Course	Artic	culatio	on Ma	frix						
Course Title:	Datab	ase Ma	nagem	ent Sys							SPPU	Course	Code:	31024	5
Designation of C			_				•								
Class: TE Co			•					Sen	ester:	\mathbf{v}			AY:	2021 -	22
Teaching Schem	e														
Assessment Tool			In	ternal .	Assessi	nent T	ool			Ex	ternal	Assessi	ment T	ool	
Theory		Unit	Test	Assign	nment	/ Tuto	Prelim	Exam		Online	/ Insen	n]	Endsen	1
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CO - PO Mappi	ng														
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310246 CO2	2	2	3	-	2	-	1	-	3	-	1	-	1	-	1
310246 CO3	-	1	2	-	2	1	-	1	3	-	-	2	1	_	-
310246 CO4	-	1	2	-	2	-	-	-	3	2	1	-	1	_	-
310246 CO5	-	1	2	-	2	-	2	-	3	1	-	1	1	1	-
310246 CO6	2	2	3	-	3	1	-	-	3	-	2	1	1	_	_
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Course Co-ordinator

Program Co-ordinator

310247: Computer Networks and Security Laboratory

Teaching Scheme Credit Scheme: 01 Examination Scheme and Marks Practical: 02 Hours/Week

Term work: 25 Marks Oral: 25 Marks

Home

Companion Course: Computer Network and Security (310244)

Course Objectives:

- · To learn computer network hardware and software components
- To learn computer network topologies and types of network
- To develop an understanding of various protocols, modern technologies and applications
- To learn modern tools for network traffic analysis
- To learn network programming

Course Outcomes:

On completion of the course, learners will be able to

CO1: Analyze the requirements of network types, topology and transmission media

CO2: Demonstrate error control, flow control techniques and protocols and analyze them

CO3: Demonstrate the subnet formation with IP allocation mechanism and apply various routing algorithms

CO4: Develop Client-Server architectures and prototypes

CO5: Implement web applications and services using application layer protocols

CO6: Use network security services and mechanisms



SINHGAD TECHNICAL EDUCATION SOCIETY'S NBN SINHGAD TECHNICAL INSTITUES CAMPUS NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41 DEPARTMENT OF COMPUTER ENGINEERING

				(Course	Artic	culatio	on Ma	trix						
Course Title:	Comp	uter No	etwork	s and S	ecurity	Labor	ratory				SPPU (Course	Code:	31024	7
Designation of C	ourse:	Core S	Subject	s											
Class: TE Co	mputer	r						Sen	nester:	\mathbf{V}			AY:	2021 -	22
Teaching Scheme	e														
Assessment Tool			In	ternal .	Assessi	nent T	ool			Ex	ternal	Assessi	ment T	ool	
Theory		Unit	Test	Assign	nment	/ Tuto	Prelim	Exam		Online	/ Insen	n]	Endsen	n
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CO - PO Mappi	ng														
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310247 CO4	-	1	2	1	1	1	-	_	-	_	-	1	1	_	-
310247 CO5	2	3	-	-	1	_	-	_	1	_	-	_	1	1	-
310247 CO6	-	1	3	1	1	_	1	_	2	_	-	1	1	_	_
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310248: Laboratory Practice I

Teaching Scheme Credit Scheme: Examination Scheme and Marks

Practical: 04 Hours/Week 02 Term work: 25 Marks Practical: 25 Marks

Companion Course: Systems Programming and Operating System (310243), Elective I (310245)

Course Objectives:

- · To learn system programming tools
- To learn modern operating system
- To learn various techniques, tools, applications in IoT and Embedded Systems /Human Computer Interface/Distributed Systems/ Software Project Management

Course Outcomes:

On completion of the course, learners will be able to

Systems Programming and Operating System

CO1: Implement language translators

CO2: Use tools like LEX and YACC

CO3: Implement internals and functionalities of Operating System

Internet of Things and Embedded Systems

CO4: Design IoT and Embedded Systems based application

CO5: Develop smart applications using IoT

CO6: Develop IoT applications based on cloud environment



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DEPARTMENT OF COMPUTER ENGINEERING

				(Course	Artic	culatio	on Ma	trix						
Course Title:	Labor	atory I	Practic	e I							SPPU	Course	Code:	31024	8
Designation of C	ourse:	Core S	Subject	S											
Class: TE Co	mpute	r						Sen	ester:	\mathbf{v}			AY:	2021 -	22
Teaching Schem	e														
Assessment Tool	l		In		Assessi					Ex	ternal	Assessi	ment T	ool	
Theory		Unit	Test	Assign	nment	/ Tuto	Prelim	Exam		Online	/ Inser	n	1	Endsen	n
Practical / Tutor		T	W		TW OR PR										
CO - PO Mappi	ng														
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
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310248 CO2	1	2	2	2	2	-	-	-	-	-	-	1	1	_	1
310248 CO3	1	2	2	2	2	-	-	-	-	-	-	1	1	_	_
310248 CO4	1	2	3	2	-	2	-	-	2	1	2	-	1	_	_
310248 CO5	1	2	2	1	-	2	-	-	3	2	1	-	1	1	_
310248 CO6	2	2	2	1	-	2	-	-	2	-	2	1	1	_	_
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3 : Substantionally (High)

: No corelation between CO and PO



Director (Prin

Home

Program Co-ordinator

SavitribaiPhule Pune University Third Year of Computer Engineering (2019 Course) 310249: Seminar and Technical Communication



Teaching Scheme Credit Scheme Examination Scheme and Marks
Practical: 01 Hours/Week 01 Term Work: 50 Marks

Course Objectives:

- To explore the basic principles of communication (verbal and non-verbal) and active, empathetic listening, speaking and writing techniques
- To explore the latest technologies
- To enhance the communication skills
- To develop problem analysis skills

Course Outcomes:

On completion of the course, learners will be able to

CO1: Analyze a latest topic of professional interest

CO2: Enhance technical writing skills

CO3: Identify an engineering problem, analyze it and propose a work plan to solve it

CO4: Communicate with professional technical presentation skills



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				(Course	Artic	culatio	on Ma	trix						
Course Title:	Semin	ar and	Techn	ical Co	mmun	ication					SPPU (Course	Code:	310249	•
Designation of C	ourse:	Core S	Subject	s											
Class: TE Co	mputer	r						Sen	ester:	\mathbf{V}			AY:	2021 -	22
Teaching Schem	e														
Assessment Tool	l		In	ternal .	Assessi	nent T	ool			Ex	ternal	Assessi	nent T	ool	
Theory		Unit	Test	Assign	nment	/ Tuto	Prelim	Exam		Online	/ Insen	n]	Endsen	a
Practical / Tutor	ial	T	W						T	W	O	R	P	R	
CO - PO Mappi	ng														
CO/PO	PO1	1 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 PSO1												PSO2	PSO3
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310249 CO2	_	1	2	1	-	-	-	-	-	-	-	-	1	-	1
310249 CO3	2	1	1	-	-	-	-	-	-	-	-	-	1	-	_
310249 CO4	1	2	2	1	-	-	-	-	-	-	-	-	1	_	_
310249 CO5	_	_	_	_	_	_	1	-	_	_	_	_	1	1	_
310249 CO6	_	_	_	_	_	_	-	-	_	_	_	_	1	-	_
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Course Co-ordinator

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Program Co-ordinator

310251: Data Science and Big Data Analytics

Teaching Scheme: TH: 03

Hours/Week

Credit: 03

Examination Scheme:

Mid-Sem (TH): 30 Marks End-Sem (TH): 70 Marks

Prerequisites Courses: Discrete Mathematics (210241), Database Management Systems (310341)

Companion Course: Data Science and Big Data Analytics Laboratory (310256)

Course Objectives:

- To understand the need of Data Science and Big Data
- To understand computational statistics in Data Science
- To study and understand the different technologies used for Big Data processing
- To understand and apply data modelling strategies
- To learn Data Analytics using Python programming
- To be conversant with advances in analytics

Course Outcomes:

After completion of the course, learners should be able to

CO1: Analyze needs and challenges for Data Science Big Data Analytics

CO2: Apply statistics for Big Data Analytics

CO3: Apply the lifecycle of Big Data analytics to real world problems

CO4: Implement Big Data Analytics using Python programming

CO5: Implement data visualization using visualization tools in Python programming

CO6: Design and implement Big Databases using the Hadoop ecosystem



SINHGAD TECHNICAL EDUCATION SOCIETY'S

NBN SINHGAD TECHNICAL INSTITUES CAMPUS

NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41

DEPARTMENT OF COMPUTER ENGINEERING

				(Course	Artic	culatio	on Ma	trix						
Course Title:	Data S	Science	and B	ig Data	Analy	tics					SPPU	Course	Code:	31025	1
Designation of C	ourse:	Core S	Subject	s											
Class: TE Co	mputer	r						Sen	nester:	VI			AY:	2021 -	22
Teaching Schem	e														
Assessment Tool	l			Interi	ıal Ass	essmen	t Tool			Ex	ternal	Assess	ment T	ool	
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Practical / Tutor	ial	T	W						Т	w	O	R	P	R	
CO - PO Mappi	ng														
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Course Co-ordinator

: No corelation between CO and PO

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Program Co-ordinator Dire

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310252: Web Technology

Teaching Scheme: Credit: 03 Examination Scheme: Mid-Sem (TH): 30 Marks
Hours/Week End-Sem (TH): 70 Marks

Prerequisites Courses: Database Management Systems (310341),

Computer Networks and Security (310244)

Companion Course: Web Technology Laboratory (310257)

Course Objectives:

- To learn the fundamentals of web essentials and markup languages
- To use the Client side technologies in web development
- To use the Server side technologies in web development
- To understand the web services and frameworks

Course Outcomes:

On completion of the course, learners should be able to

CO1: Implement and analyze behavior of web pages using HTML and CSS

CO2: Apply the client side technologies for web development

CO3: Analyze the concepts of Servlet and JSP

CO4: Analyze the Web services and frameworks

CO5: Apply the server side technologies for web development

CO6: Create the effective web applications for business functionalities using latest web development platforms



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Course Articulation Matrix Course Title: Web Technology SPPU Course Code: 310252 Designation of Course: Core Subjects Class: TE Computer Semester: VI AY: 2021 - 22 Teaching Scheme Assessment Tool External Assessment Tool Internal Assessment Tool Theory Unit Test | Assignment / Tuto | Prelim Exam Online / Insem Endsem Practical / Tutorial TW TW OR CO - PO Mapping CO/PO PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 PSO₃ 310252 CO1 1 2 1 310252 CO2 2 1 3 1 1 1 310252 CO3 2 2 1 1 310252 CO4 1 3 1 2 2 1 1 1 1 310252 CO5 1 2 3 1 1 1 1 1 310252 CO6 310252 1.60 1.40 1.60 1.80 1.60 1.00 1.00 1.00 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00

CO- PO mapping is done with corelation level 1, 2, 3 and —

1 : Slightly (low)

2 : Moderately (Medium)

3: Substantionally (High)

- : No corelation between CO and PO

Bloom's Taxonomy

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Course Co-ordinator

SKS

Director / Principal

Home

Savitribai Phule Pune University

Third Year of Computer Engineering (2019 Course)

310253: Artificial Intelligence

Teaching Scheme: TH: 03

Credit: 03

Examination Scheme: Mid-Sem (TH): 30 Marks End-Sem (TH): 70 Marks

Hours/Week Prerequisites Courses: Programming and Problem solving (110005),

Data Structures and Algorithms (210252)

Companion Course: Laboratory Practice II (310258)

Course Objectives:

- To understand the concept of Artificial Intelligence (AI) in the form of various Intellectual tasks
- To understand Problem Solving using various peculiar search strategies for AI
- To understand multi-agent environment in competitive environment
- To acquaint with the fundamentals of knowledge and reasoning
- To devise plan of action to achieve goals as a critical part of AI
- To develop a mind to solve real world problems unconventionally with optimality

Course Outcomes:

After completion of the course, students should be able to

- CO1: Identify and apply suitable Intelligent agents for various AI applications
- CO2: Build smart system using different informed search / uninformed search or heuristic approaches
- CO3: Identify knowledge associated and represent it by ontological engineering to plan a strategy to solve given problem
- CO4: Apply the suitable algorithms to solve AI problems
- CO5: Implement ideas underlying modern logical inference systems
- CO6: Represent complex problems with expressive yet carefully constrained language of representation



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DEPARTMENT OF COMPUTER ENGINEERING

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: No corelation between CO and PO

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Elective II

310254(A): Information Security

Teaching Scheme: Credit: 03 Examination Scheme: TH: 03 Mid-Sem (TH): 30 Marks Hours/Week

End-Sem (TH): 70 Marks

Prerequisites Courses: -- Computer Networks and Security (310244)

Companion Course: -- Laboratory Practice II (310258)

Course Objectives:

- · To understand the fundamental approaches, principles and apply these concepts in Information Security
- To acquire the knowledge of mathematics for cryptography, understand the concepts of basic cryptography
- To learn standard algorithms and protocols employed to provide confidentiality, integrity and authenticity
- To acquire the knowledge of security protocol deployed in web security
- To study Information Security tools

Course Outcomes:

On completion of the course, learners should be able to

CO1: Model the cyber security threats and apply formal procedures to defend the attacks

- CO2: Apply appropriate cryptographic techniques by learning symmetric and asymmetric key cryptography
- CO3: Design and analyze web security solutions by deploying various cryptographic techniques along with data integrity algorithms
- CO4: Identify and Evaluate Information Security threats and vulnerabilities in Information systems and apply security measures to real time scenarios
- CO5: Demonstrate the use of standards and cyber laws to enhance Information Security in the development process and infrastructure protection



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NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41

DEPARTMENT OF COMPUTER ENGINEERING

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Course Co-ordinator

- : No corelation between CO and PO

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Home

Savitribai Phule Pune University

Third Year of Computer Engineering (2019 Course)

310255: Internship**

Teaching Scheme: Credit: 04 Examination Scheme: Term work: 100 Marks



Course Objectives:

Internship provides an excellent opportunity to learner to see how the conceptual aspects learned in classes are integrated into the practical world. Industry/on project experience provides much more professional experience as value addition to classroom teaching.

- To encourage and provide opportunities for students to get professional/personal experience through internships.
- To learn and understand real life/industrial situations.
- To get familiar with various tools and technologies used in industries and their applications.
- To nurture professional and societal ethics.
- To create awareness of social, economic and administrative considerations in the working environment of industry organizations.

Course Outcomes:

On completion of the course, learners should be able to

CO1: To demonstrate professional competence through industry internship.

CO2: To apply knowledge gained through internships to complete academic activities in a professional manner.

CO3: To choose appropriate technology and tools to solve given problem.

CO4: To demonstrate abilities of a responsible professional and use ethical practices in day to day life.

CO5: Creating network and social circle, and developing relationships with industry people.

CO6: To analyze various career opportunities and decide carrier goals.



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NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41

DEPARTMENT OF COMPUTER ENGINEERING

				-	Course	Artic	culatio	on Ma	trix						
Course Title:	Intern	ship									SPPU (Course	Code:	31025	5
Designation of C	ourse:	Intern	ship												
Class: TE Co	mpute	r	-					Sen	nester:	VI			AY:	2021 -	22
Teaching Schem	e														
Assessment Tool	l		In	ternal .	Assessi	nent T	ool			Ex	ternal	Assessi	ment T	ool	
Theory		Unit	Test	Assign	nment	/ Tuto	Prelim	Exam		Online	/ Insen	n	1	Endsen	n
Practical / Tutor	ial	Т	w						T	w	0	R	P	R	
CO - PO Mappi	ng														
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO ₃
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310255 CO3	-	-	-	-	-	1	-	-	2	2	1	1	1	_	_
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Savitribai Phule Pune University Third Year of Computer Engineering (2019 Course) 310256: Data Science and Big Data Analytics Laboratory



Teaching Scheme Credit Scheme: Examination Scheme and Marks

Practical: 04 Hours/Week 02 Term work: 50 Marks Practical: 25 Marks

Companion Course: Data Science and Big Data Analytics (310251)

Course Objectives:

- To understand principles of Data Science for the analysis of real time problems
- To develop in depth understanding and implementation of the key technologies in Data Science and Big Data Analytics
- To analyze and demonstrate knowledge of statistical data analysis techniques for decision-making
- · To gain practical, hands-on experience with statistics programming languages and Big Data tools

Course Outcomes:

On completion of the course, learners will be able to

CO1: Apply principles of Data Science for the analysis of real time problems

CO2: Implement data representation using statistical methods

CO3: Implement and evaluate data analytics algorithms

CO4: Perform text preprocessing

CO5: Implement data visualization techniques

CO6: Use cutting edge tools and technologies to analyze Big Data



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CO - PO Mappi	ng														
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO ₂	PSO3
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310256 CO2	2	2	2	2	3	_	-	_	-	-	_	_	1	_	1
310256 CO3	2	2	2	_	2	_	_	-	-	_	_	_	1	_	-
310256 CO4	2	2	2	2	2	2	_	-	-	_	_	_	1	_	-
310256 CO5	2	2	2	2	2	2	_	_	_	_	_	_	1	1	-
310256 CO6	2	2	2	2	2	2	_	_	_	_	3	_	1	_	_
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Course Co-ordinator

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Director / Principal

310257: Web Technology Laboratory

Home

Teaching Scheme Credit Scheme Examination Scheme and Marks
Practical: 02 Hours/Week 01 Term Work: 25 Marks

Oral: 25 Marks

Companion Course: Web Technology (310252)

Course Objectives:

To learn the web based development environment

To use client side and server side web technologies

To design and develop web applications using front end technologies and backend databases

Course Outcomes:

On completion of the course, learners will be able to

CO1: Understand the importance of website planning and website design issues

CO2: Apply the client side and server side technologies for web application development

CO3: Analyze the web technology languages, frameworks and services

CO4: Create three tier web based applications



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DEPARTMENT OF COMPUTER ENGINEERING	
Course Articulation Matrix	

Course Title: Web Technology Laboratory

Designation of Course: Core Subjects

Class: TE Computer Semester: VI AY: 2021 - 22

Teaching Scheme

Assessment Tool		In	ternal .	Assessi	nent T	ool	External Assessment Tool								
Theory	Unit Test		Assignment / Tuto			Prelim	Exam Onlin		Online	/ Insen	n	Endsem		n	
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CO - PO Mapping															
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310257 CO2	2	2	_	2	1	_	_	_	1	_	-	-	1	_	1
310257 CO3	2	_	3	-	-	1	_	_	_	1	1	-	1	_	_
310257 CO4	1	2	2	1	2	1	1	_	_	_	_	1	1	_	_
310257 CO5	_	_	_	_	_	_	_	_	_	_	-	_	1	1	_
310257 CO6	_	_	_	_	_	_	_	_	_	_	_	_	1	_	_
310257	1.67	1.67	2.67	1.33	1.50	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

CO- PO mapping is done with corelation level 1, 2, 3 and -

1 : Slightly (low)

2 : Moderately (Medium)

3 : Substantionally (High)

— : No corelation between CO and PO

Bloom's Taxonomy

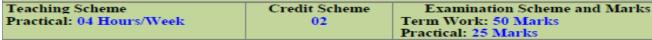
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SPPU Course Code: 310257

Course Co-ordinator Program Co-ordinator

310258: Laboratory Practice II



Companion Course: Artificial Intelligence (310253), Elective II (310245)

Course Objectives:

- To learn and apply various search strategies for AI
- · To Formalize and implement constraints in search problems
- To understand the concepts of Information Security / Augmented and Virtual Reality/Cloud Computing/Software Modeling and Architectures

Course Outcomes:

On completion of the course, learner will be able to

- Artificial Intelligence
 - CO1: Design system using different informed search / uninformed search or heuristic approaches
 - CO2: Apply basic principles of AI in solutions that require problem solving, inference, perception, knowledge representation, and learning
 - CO3: Design and develop an expert system
- Information Security
 - CO4: Use tools and techniques in the area of Information Security
 - CO5: Use the knowledge of security for problem solving
 - CO6: Apply the concepts of Information Security to design and develop applications



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NBN SINHGAD TECHNICAL INSTITUES CAMPUS

NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41

DEPARTMENT OF COMPUTER ENGINEERING

Course Articulation Matrix																
Course Title: Laboratory Practice II SPPU Course Code: 310258														e		
Designation of Course: Core Subjects																
			subject													
Class: TE Co	iester:	VI		AY: 2021 - 22												
Teaching Scheme Assessment Tool Internal Assessment Tool External Assessment Tool																
Assessment Tool	External Assessment Tool															
Theory	Exam	(Online	/ Inser	Endsem											
Practical / Tutor						TW OR			PR							
CO - PO Mapping																
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO ₃	
310258 CO1	2	_	2	_	3	_	_	2	2	2	1	2	1	_	-	
310258 CO2	1	_	2	2	3	2	_	2	2	2	1	2	1	_	1	
310258 CO3	1	_	2	2	3	2	_	2	2	2	2	2	1	_	-	
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310258 CO5	1	_	2	_	3	_	_	2	2	2	2	2	1	1	_	
310258 CO6	1	_	2	_	3	_	_	2	2	2	2	2	1	_	_	
310258	1.17	0.00	2.00	2.00	3.00	2.00	0.00	2.00	2.00	2.00	1.67	2.00	1.00	1.00	1.00	
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CO- PO mapping	is done	with c	orelatio	n level	1, 2, 3	and —			CREATE Engineering comments appropriate formation purpose propriate appropriate comments and the comments appropriate appropri							
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Course Co-ordinator

SES

Director / Pr

Program Co-ordinator

Director / Principal

Home

Faculty of Engineering Savitribai Phule Pune University, Pune

Maharashtra, India



Syllabus

for

Fourth Year of Computer Engineering (2015 Course)

(with effect from 2018-19)

Savitribai Phule Pune University Fourth Year of Computer Engineering (2015 Course) 410241: High Performance Computing

Teaching Scheme:

TH: 04 Hours/Week

Credit

O4

Examination Scheme:

In-Sem (Paper): 30 Marks

End-Sem (Paper): 70 Marks

Prerequisite Courses: 210253-Microprocessor, 210244- Computer Organization and

Architecture, 210254-Principles of Programming Languages, 310251- Systems Programming and Operating System

Companion Course: 410246-Laboratory Practice I

Course Objectives:

- · To study parallel computing hardware and programming models
- To be conversant with performance analysis and modeling of parallel programs
- To understand the options available to parallelize the programs
- To know the operating system requirements to qualify in handling the parallelization

Course Outcomes:

On completion of the course, student will be able to-

- Describe different parallel architectures, inter-connect networks, programming models
- Develop an efficient parallel algorithm to solve given problem
- Analyze and measure performance of modern parallel computing systems
- Build the logic to parallelize the programming task



SINHGAD TECHNICAL EDUCATION SOCIETY'S NBN SINHGAD TECHNICAL INSTITUES CAMPUS NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41 DEPARTMENT OF COMPUTER ENGINEERING

I				(Course	Artic	culatio	on Ma	trix							
Course Title:	SPPU Course Code: 410241															
Designation of C	ourse:	Core S	Subject	s												
Class: BE Computer Sem										VII		AY:	2021 -	22		
Teaching Schem	e															
Assessment Tool	l		In	ternal .	Assessi	nent T	ool		External Assessment Tool							
Theory Unit Test Assignment / Tuto Prelim E										Online	/ Insen	Endsem				
Practical / Tutor	W						TW OR			PR						
CO - PO Mapping																
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
410241 CO1	2	1	-	-	-	-	-	-	-	-	-	-	1	_	-	
410241 CO2	2	1	ı	-	-	-	-	-	-	-	-	-	1	_	1	
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410241 CO4	1	2	-	2	-	-	-	-			1	_	_			
410241 CO5	1	2	-	2	-	-	-	-	-	-	-	1	1	1	_	
410241 CO6	2	2	-	2	-	-	-	-	-	-	-	1	1	_	-	
410241	1.67	1.50	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	
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Course Co-ordinator

ABS-Program Co-ordinator

Savitribai Phule Pune University Fourth Year of Computer Engineering (2015 Course)

410242: Artificial Intelligence and Robotics

Teaching Scheme: Examination Scheme: Credit In-Sem (Paper): 30 Marks 03 TH: 03 Hours/Week End-Sem (Paper): 70 Marks

Prerequisite Courses: 210254-Principles of Programming Languages

Companion Course: 410246-Laboratory Practice I

Course Objectives:

- To understand the concept of Artificial Intelligence (AI)
- To learn various peculiar search strategies for AI
- To acquaint with the fundamentals of mobile robotics
- To develop a mind to solve real world problems unconventionally with optimality

Course Outcomes:

On completion of the course, student will be able to-

- Identify and apply suitable Intelligent agents for various AI applications
- Design smart system using different informed search / uninformed search or heuristic
- Identify knowledge associated and represent it by ontological engineering to plan a strategy to solve given problem.
- Apply the suitable algorithms to solve AI problems



SINHGAD TECHNICAL EDUCATION SOCIETY'S NBN SINHGAD TECHNICAL INSTITUES CAMPUS NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41 DEPARTMENT OF COMPUTER ENGINEERING

				(Course	Artic	culatio	on Ma	trix						
Course Title:	Artific	ial Int	elligen	ce and	Roboti	cs					SPPU (Course	Code:	410242	2
Designation of C	ourse:	Core S	Subject	s											
Class: BE Co	mpute	r						Sen	nester:	VII			AY:	2021 -	22
Teaching Schem	e														
Assessment Tool			In	ternal .	Assessi	nent T	ool			Ex	ternal	Assessi	ment T	ool	
Theory		Unit	Test	Assign	nment	/ Tuto	Prelim	Exam	•	Online	/ Insen	n	1	Endsen	a
Practical / Tutor	ial	T	W						T	W	О	R	P	R	
CO - PO Mappi	ng														
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO ₃
410242 CO1	3	2	3	2	1	1	_	_	-	_	_	1	3	2	_
410242 CO2	3	2	3	2	1	_	_	_	-	_	_	1	3	2	_
410242 CO3	3	2	3	2	1	1	_	-	-	_	_	1	3	2	_
410242 CO4	3	2	3	2	1	1	_	_	_	_	_	1	3	2	_
410242 CO5	3	2	3	2	_	_	_	1	-	_	_	1	3	2	_
410242 CO6	3	2	3	2	1	1	_	-	ı	_	_	1	3	2	_
410242	3.00	2.00	3.00	2.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00		2.00	0.00
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CO- PO mapping	is done	with c	orelatio	n level	1, 2, 3	and —	-		_		CREATE PO	oduce new or only	irad swarts una compressure deven	op. Formulate, author,	nunnique
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Course Co-ordinator

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Savitribai Phule Pune University Fourth Year of Computer Engineering (2015 Course)

410243: Data Analytics

Teaching Scheme:	Credit	Examination Scheme:
		In-Sem (Paper): 30 Marks
TH: 03 Hours/Week	03	End-Sem (Paper): 70 Marks

Prerequisite Courses: 310242-Database Management Systems

Companion Course: 410246-Laboratory Practice I

Course Objectives:

- To develop problem solving abilities using Mathematics
- · To apply algorithmic strategies while solving problems
- To develop time and space efficient algorithms
- To study algorithmic examples in distributed, concurrent and parallel environments

Course Outcomes:

On completion of the course, student will be able to-

- Write case studies in Business Analytic and Intelligence using mathematical models
- · Present a survey on applications for Business Analytic and Intelligence
- Provide problem solutions for multi-core or distributed, concurrent/Parallel environments



SINHGAD TECHNICAL EDUCATION SOCIETY'S NBN SINHGAD TECHNICAL INSTITUES CAMPUS NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41 DEPARTMENT OF COMPUTER ENGINEERING

					Course	Artic	culatio	on Ma	trix						
Course Title:	Data A	Analyti	cs								SPPU	Course	Code:	41024	3
Designation of C	ourse:	Core S	Subject	s											
Class: BE Co	mpute	r						Sen	nester:	VII			AY:	2021 -	22
Teaching Schem	e														
Assessment Tool			In	ternal .	Assessi	nent T	ool			Ex	ternal	Assess	ment T	ool	
Theory		Unit	Test	Assig	nment	/ Tuto	Prelim	Exam		Online	/ Insen	n	1	Endsen	n
Practical / Tutor	ial	T	w						Т	w	0	R	P	R	
CO - PO Mappi	ng	•		•	•	•	•				•		•		
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO ₂	PSO ₃
410243 CO1	3	2	2	2	2	-	-	-	-	-	-	1	2	2	-
410243 CO2	3	2	2	2	2	1	1	-	-	-	-	-	2	2	-
410243 CO3	3	2	2	2	2	-	-	-	-	-	-	1	2	2	-
410243 CO4	2	2	-	3	3	-	-	-	-	-	-	1	2	2	-
410243 CO5	3	2	2	2	2	1	-	-	-	-	-	1	2	2	-
410243 CO6	2	2	2	1	3	-	-	-	-	-	-	-	2	2	-
410243	3.00	2.00	3.00	3.00	3.00	2.00	2.00	3.00	3.00	3.00	2.00	2.00	2.00	3.00	1.00
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Course Co-ordinator

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Director / Principal

Savitribai Phule Pune University Fourth Year of Computer Engineering (2015 Course) Elective I

410244(D): Data Mining and Warehousing

Teaching Scheme:
TH: 03 Hours/Week

Credit
O3

Credit
In-Sem (Paper): 30 Marks
End-Sem (Paper): 70 Marks

Prerequisite Courses: 310242-Database Management Systems, 310244- Information Systems and Engineering Economics

Companion Course: 410247-Laboratory Practice II

Course Objectives:

- To understand the fundamentals of Data Mining
- To identify the appropriateness and need of mining the data
- To learn the preprocessing, mining and post processing of the data
- To understand various methods, techniques and algorithms in data mining

Course Outcomes:

On completion of the course the student should be able to-

- · Apply basic, intermediate and advanced techniques to mine the data
- · Analyze the output generated by the process of data mining
- Explore the hidden patterns in the data
- Optimize the mining process by choosing best data mining technique



SINHGAD TECHNICAL EDUCATION SOCIETY'S NBN SINHGAD TECHNICAL INSTITUES CAMPUS NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41 DEPARTMENT OF COMPUTER ENGINEERING

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Course Title:	Data M	_		arehou	ising						SPPU	Course	Code:	41024	1 (D)
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Class: BE Co	mpute	r						Sem	iester:	VII			AY:	2021 -	22
Teaching Schem	e														
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Theory		Unit	Test	Assig	nment	/ Tuto	Prelim	Exam		Online	/ Insen	n]	Endsen	n
Practical / Tutor	ial	Т	W						T	w	О	R	P	R	
CO - PO Mappi	ng														
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO ₂	PSO3
410244 CO1	2	1	-	2	1	1	-	-	-	-	-	1	1	_	_
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41024 CO3	3	2	_	1	-	2	_	_	-	-	-	1	1	_	_
410244 CO4	2	2	3		-	1	_	_	_	-	-	2	1	_	_
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Savitribai Phule Pune University Fourth Year of Computer Engineering (2015 Course) Elective II

410245(B): Software Testing and Quality Assurance

Teaching Scheme:

TH: 03 Hours/Week

Credit

O3

Credit

In-Sem (Paper): 30 Marks

End-Sem (Paper): 70 Marks

Prerequisite Courses: 310243- Software Engineering and Project Management,310263- Software

Modeling and Design

Companion Course: 410247-Laboratory Practice II

Course Objectives:

- Introduce basic concepts of software testing
- Understand white box, block box, object oriented, web based and cloud testing
- Know in details automation testing and tools used for automation testing
- Understand the importance of software quality and assurance software systems development.

Course Outcomes:

On completion of the course, student will be able to-

- Describe fundamental concepts in software testing such as manual testing, automation testing and software quality assurance.
- Design and develop project test plan, design test cases, test data, and conduct test operations
- Apply recent automation tool for various software testing for testing software
- Apply different approaches of quality management, assurance, and quality standard to software system
- Apply and analyze effectiveness Software Quality Tools



SINHGAD TECHNICAL EDUCATION SOCIETY'S NBN SINHGAD TECHNICAL INSTITUES CAMPUS NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41 DEPARTMENT OF COMPUTER ENGINEERING

				(Course	Artic	culatio	on Ma	trix						
Course Title:	Softwa	are Tes	ting an	ıd Qua	lity Ass	suranc	e			:	SPPU	Course	Code:	410245	5 (B)
Designation of C	ourse:	Electiv	ve II												
Class: BE Co	mpute	r						Sen	nester:	VII			AY:	2021 -	22
Teaching Schem	e														
Assessment Tool	l		In	ternal .	Assessi	nent T	ool			Ex	ternal	Assessi	ment T	ool	
Theory		Unit	Test	Assign	nment	/ Tuto	Prelim	Exam	•	Online	/ Insen	n]	Endsen	n
Practical / Tutor	rial	T	W						T	W	O	R	P	R	
CO - PO Mappi	ing														
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
#10243 CO1	3	1	1	2	2	_	_	1	2	1	2	1	_	1	_
410245 CO2	1	3	3	2	1	_	_	1	2	1	2	_	_	_	-
410243 CO3	1	_	1	2	3	_	_	_	2	1	1	_	1	-	-
410243 CO4	1	1	2	3	1	1	1	2	2	2	2	_	_	_	-
410245 CO5	1	2	1	2	3	1	-	_	1	1	2	_	_	_	_
410243 CO6	1	2	3	2	3	1	_	_	2	1	1	_	_	_	_
410245 (B)	1.33	1.80	1.83	2.17	2.17	1.00	1.00	1.33	1.83	1.17	1.67	1.00	1.00	1.00	0.00
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CO- PO mapping	is done	with c	orelatio	n level	1, 2, 3	and —	-				CREATE	obuse new or original	nal work	gs. Formulate, author, i	numique
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3 : Substantionall	y (High)							9		UNDERSTAND	to herouse	DESCRIPTION AND LOSS	demonstrate, interpr	en reportation



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Savitribai Phule Pune University

Fourth Year of Computer Engineering (2015 Course)

410246:Laboratory Practice I

Teaching Scheme: Credit Examination Scheme:

Practical: 04 Hours/Week Term Work: 50 Marks

Practical: 50 Marks

Companion Courses: 410241, 410242 and 410243

Course Objectives and Outcomes: Practical hands on is the absolute necessity as far as employability of the learner is concerned. The presented course is solely intended to enhance the competency by undertaking the laboratory assignments of the core courses.



SINHGAD TECHNICAL EDUCATION SOCIETY'S

NBN SINHGAD TECHNICAL INSTITUES CAMPUS

NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41

DEPARTMENT OF COMPUTER ENGINEERING

				(Course	Arti	culatio	n Ma	trix							
Course Title:	Labor	atory I	Practice	e I							SPPU (Course	Code:	410240	6	
Designation of C	ourse:	Core S	Subject	s												
Class: BE Co	mputer	r						Sen	nester:	VII			AY:	2021 -	22	
Teaching Scheme	e															
Assessment Tool			In	ternal .	Assessi	nent T	ool			Ex	ternal	Assessi	ment T	ool		
Theory		Unit Test Assignment / Tuto Prelim Exam Online / Insem Endsem TW OR PR														
Practical / Tutor	ial	T														
CO - PO Mappi	ng															
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
410246 CO1	3	3	2	3	3	1	3	1	2	1	3	-	-	1	-	
410246 CO2	3	2	1	3	2	3	-	1	-	1	3	2	-	2	-	
410246 CO3	3	3	2	3	1	3	-	1	1	1	3	-	-	-	-	
410246 CO4	3	3	3	3	2	2	3	1	2	1	3	-	-	-	-	
410246 CO5	3	3	3	3	3	1	-	1	2	1	3	-	-	2	-	
410246 CO6	3	3	3	3	2	3	1	1	-	1	3	-	-	1	-	
410246	3.00	2.83	2.33	3.00	2.17	2.17	2.33	1.00	1.75	1.00	3.00	2.00	0.00	1.50	0.00	

CO- PO mapping is done with corelation level 1, 2, 3 and -

- 1 : Slightly (low)
- 2 : Moderately (Medium)
- 3 : Substantionally (High)
- : No corelation between CO and PO

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Program Co-ordinator

Director / Principal

Course Co-ordinator

Savitribai Phule Pune University Fourth Year of Computer Engineering (2015 Course) 410247:Laboratory Practice II

Teaching Scheme: Credit Examination Scheme:

Practical: 04 Hours/Week Term Work: 50 Marks
Presentation: 50 Marks

Companion Courses: 410244 and 410245

Course Objectives and Outcomes: Practical hands on is the absolute necessity as far as employability of the learner is concerned. The presented course is solely intended to enhance the competency by undertaking the laboratory assignments of the core courses. Enough choice is provided to the learner to choose an elective of one's interest.

Laboratory Practice II is companion lab for elective course I and elective course II.



SINHGAD TECHNICAL EDUCATION SOCIETY'S NBN SINHGAD TECHNICAL INSTITUES CAMPUS NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41 DEPARTMENT OF COMPUTER ENGINEERING

					Course	Artic	culatio	on Ma	trix							
Course Title:	Labor	atory I	Practice	e II						:	SPPU (Course	Code:	41024	7	
Designation of C	ourse:	Core S	Subject	s												
Class: BE Co	mputer	r						Sem	ester:	VII			AY:	2021 -	22	
Teaching Scheme	e															
Assessment Tool																
Theory		Unit														
Practical / Tutor	ial	T														
CO - PO Mappi	ng															
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	
410247 CO1	3	3	3	3	1	3	1	-	1	-	2	-	3	3	-	
410247 CO2	3	2	3	2	2	3	2	-	-	-	3	-	3	2	-	
410247 CO3	3	3	3	3	1	3	-	1	2	3	3	2	3	1	-	
410247 CO4	3	2	2	3	3	2	3	2	1	2	-	3	2	-	-	
410247 CO5	3	2	2	3	1	1	1	3	2	1	-	2	1	-	-	
410247 CO6	3	2	3	3	3	3	2	1	3	3	2	3	1	1	-	
410247	3.00	2.33	2.67	2.83	1.83	2.50	1.80	1.75	1.80	2.25	2.50	2.50	2.17	1.75	0.00	

CO- PO mapping is done with corelation level 1, 2, 3 and -

- 1 : Slightly (low)
- 2 : Moderately (Medium)
- 3 : Substantionally (High)
 - : No corelation between CO and PO

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Course Co-ordinator

Program Co-ordinator

Savitribai Phule Pune University Fourth Year of Computer Engineering (2015 Course) 410248:Project Work Stage I

Teaching Scheme: Credit Examination Scheme: 02

Practical: 02 Hours/Week Presentation: 50 Marks

Course Objectives:

- To Apply the knowledge for solving realistic problem
- To develop problem solving ability
- To Organize, sustain and report on a substantial piece of team work over a period of several
- To Evaluate alternative approaches, and justify the use of selected tools and methods,
- To Reflect upon the experience gained and lessons learned,
- To Consider relevant social, ethical and legal issues,
- To find information for yourself from appropriate sources such as manuals, books, research journals and from other sources, and in turn increase analytical skills.
- To Work in TEAM and learn professionalism.

Course Outcomes:

On completion of the course, student will be able to-

- Solve real life problems by applying knowledge.
- Analyze alternative approaches, apply and use most appropriate one for feasible solution.
- Write precise reports and technical documents in a nutshell.
- Participate effectively in multi-disciplinary and heterogeneous teams exhibiting team work. Inter-personal relationships, conflict management and leadership quality.



SINHGAD TECHNICAL EDUCATION SOCIETY'S NBN SINHGAD TECHNICAL INSTITUES CAMPUS NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41 DEPARTMENT OF COMPUTER ENGINEERING

				(Course	Artic	culatio	on Ma	trix						
Course Title:	Projec	t Worl	k Stage	I							SPPU	Course	Code:	41024	8
Designation of C	ourse:	Core S	Subject	s											
Class: BE Co	mpute	r						Sen	nester:	VII			AY:	2021 -	22
Teaching Schem	e														
Assessment Tool	l		In	ternal .	Assessi	nent T	ool			Ex	ternal	Assess	ment T	ool	
Theory		Unit	Test	Assig	nment	/ Tuto	Prelim	Exam		Online	/ Inser	n]	Endsen	n
Practical / Tutor	ial	Т	w						Т	w	O	R	P	R	
CO - PO Mappi	ng	•			•		•				•		•		•
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO ₂	PSO3
410248 CO1	1	3	1	3	3	1	2	3	2	1	1	3	3	3	2
410248 CO2	1	3	2	3	3	1	1	3	2	3	1	3	3	2	2
410248 CO3	3	2	2	3	2	3	1	1	3	3	3	3	2	2	1
410248 CO4	1	3	3	3	3	2	1	3	2	1	2	3	2	2	1
410248 CO5	_	_	_	_	_	_	_	_	-	_	_	_	_	_	_
410248 CO6	-	_	_	_	_	_	_	_	-	_	_	_	_	_	_
410248	1.50	2.75	2.00	3.00	2.75	1.75	1.25	2.50	2.25	2.00	1.75	3.00	2.50	2.25	1.50
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CO- PO mapping	is done	with c	orelatio	n level	1, 2, 3	and —	-		-	_		oduce new or only		op. Formulatin, auditor.	incodigues
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: No corelation between CO and PO

SES

Director / Principal

Savitribai Phule Pune University Fourth Year of Computer Engineering (2015 Course) 410250: Machine Learning

Teaching Scheme:
TH: 03 Hours/Week

Credit
03

Examination Scheme:
In-Sem (Paper): 30 Marks
End-Sem (Paper): 70 Marks

Prerequisite Courses: 207003- Engineering Mathematics III

Companion Course: 410254- Laboratory Practice III

Course Objectives:

- · To understand human learning aspects and relate it with machine learning concepts.
- To understand nature of the problem and apply machine learning algorithm.
- To find optimized solution for given problem.

Course Outcomes:

On completion of the course, student will be able to-

- Distinguish different learning based applications
- Apply different preprocessing methods to prepare training data set for machine learning.
- Design and implement supervised and unsupervised machine learning algorithm.
- Implement different learning models
- Learn Meta classifiers and deep learning concepts



SINHGAD TECHNICAL EDUCATION SOCIETY'S NBN SINHGAD TECHNICAL INSTITUES CAMPUS NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41 DEPARTMENT OF COMPUTER ENGINEERING

				(Course	Artic	culatio	on Ma	trix						
Course Title:	Machi	ne Lea	rning								SPPU (Course	Code:	410250)
Designation of C	ourse:	Core S	Subject	S											
Class: BE Co	mputer	r						Sen	nester:	VIII			AY:	2021 -	22
Teaching Schem	e														
Assessment Tool			In	ternal .	Assessi	nent T	ool			Ex	ternal	Assessi	ment T	ool	
Theory		Unit	Test	Assign	nment	/ Tuto	Prelim	Exam	•	Online	/ Insen	n	1	Endsen	n
Practical / Tutor	ial	T	W						T	W	O	R	P	R	
CO - PO Mappi	ng														
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
410250 CO1	2	-	_	2	_	_	1	1	1	1	1	1	1	1	1
410250 CO2	2	1	_	1	1	1	1	1	1	1	1	1	1	1	1
410250 CO3	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1
410250 CO4	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1
410250 CO5	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1
410250 CO6	2	_	2	1	1	1	1	1	1	1	1	1	1	1	1
410250	2.00	1.75	2.00	1.17	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00_
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CO- PO mapping	is done	with c	orelatio	n level	1, 2, 3	and —	-		-		CREATE PO	Australia control	et conjecture develo	gs, formstate, autros, i	romigen
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3 : Substantionall	y (High)							9		UNDERSTAND	Total Control	nisin Mass or coor	MORE ENGINEERS INDUSTRIES, BOOKE	n. recogmiss.
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SES

Director / Principal

Savitribai Phule Pune University Fourth Year of Computer Engineering (2015 Course) 410251: Information and Cyber Security

Teaching Scheme:
TH: 03 Hours/Week

Credit
03

Credit
In-Sem (Paper): 30 Marks
End-Sem (Paper): 70 Marks

Prerequisite Courses: 310245-Computer Networks
Companion Course: 410254: Laboratory Practice III

Course Objectives:

- To offer an understanding of principle concepts, central topics and basic approaches in information and cyber security.
- To know the basics of cryptography.
- To acquire knowledge of standard algorithms and protocols employed to provide confidentiality, integrity and authenticity.
- To enhance awareness about Personally Identifiable Information (PII), Information Management, cyber forensics.

Course Outcomes:

On completion of the course, student will be able to-

- Gauge the security protections and limitations provided by today's technology.
- Identify information security and cyber security threats.
- Analyze threats in order to protect or defend it in cyberspace from cyber-attacks.
- Build appropriate security solutions against cyber-attacks.



SINHGAD TECHNICAL EDUCATION SOCIETY'S NBN SINHGAD TECHNICAL INSTITUES CAMPUS NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41 DEPARTMENT OF COMPUTER ENGINEERING

				(Course	Artic	culatio	on Ma	trix						
Course Title:	Inform	nation	and Cy	ber Se	curity						SPPU	Course	Code:	41025	1
Designation of C	ourse:	Core S	Subject	s											
Class: BE Co	mpute	r						Sen	nester:	VIII			AY:	2021 -	22
Teaching Schem	e														
Assessment Tool			In	ternal .	Assessi	nent T	ool			Ex	ternal	Assessi	ment T	ool	
Theory		Unit	Test	Assign	nment	/ Tuto	Prelim	Exam	•	Online	/ Insen	n	1	Endsen	n
Practical / Tutor	ial	T	W						T	W	O	R	P	R	
CO - PO Mappi	ng														
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
410251 CO1	3	2	2	3	2	1	2	1	-	1	3	2	2	-	-
410251 CO2	3	3	3	3	2	-	-	-	-	1	2	2	3	-	-
410251 CO3	3	3	2	3	2	-	1	2	1	2	3	3	3	3	-
410251 CO4	3	3	3	3	3	-	1	-	1	2	2	3	2	1	-
410251 CO5	3	3	3	3	3	1	-	1	-	-	3	3	2	2	-
410251 CO6	3	2	2	2	3	2	-	2	1	1	2	2	1	-	-
410251	3.00	2.67	2.50	2.83	2.50	1.33	1.33	1.50	1.00	1.40	2.50	2.50	2.17	2.00	0.00
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Program Co-ordinator

Savitribai Phule Pune University Fourth Year of Computer Engineering (2015 Course)

Elective III

410252(D): Soft Computing and Optimization Algorithms

Teaching Scheme:
TH: 03 Hours/Week

Credit
03

Credit
In-Sem (Paper): 30 Marks
End-Sem (Paper): 70 Marks

Prerequisite Courses: 310250-Design and Analysis of Algorithm

Companion Course: 410255-Laboratory Practice IV

Course Objectives:

- To know the basics behind the Design and development intelligent systems in the framework of soft computing
- To acquire knowledge of Artificial Neural Networks Fuzzy sets, Fuzzy Logic, Evolutionary computing and swarm intelligence
- To explore the applications of soft computing
- To understand the need of optimization

Course Outcomes:

On completion of the course, student will be able to-

- Apply soft computing methodologies, including artificial neural networks, fuzzy sets, fuzzy logic, fuzzy inference systems and genetic algorithms
- Design and development of certain scientific and commercial application using computational neural network models, fuzzy models, fuzzy clustering applications and genetic algorithms in specified applications.



SINHGAD TECHNICAL EDUCATION SOCIETY'S
NBN SINHGAD TECHNICAL INSTITUES CAMPUS

NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41

DEPARTMENT OF COMPUTER ENGINEERING

				(Course	Artic	culatio	on Ma	trix						
Course Title:	Soft C	omput	ing and	l Optin	nizatio	n Algo	r ithm s			:	SPPU (Course	Code:	41025	2
Designation of C	ourse:	Electiv	ve												
Class: BE Co	mpute	r						Sen	nester:	VIII			AY:	2021-	22
Teaching Schem	e														
Assessment Tool	l		In	ternal .	Assessi	nent T	ool			Ex	ternal	Assessi	ment T	ool	
Theory		Unit	Test	Assign	nment	/ Tuto	Prelim	Exam	•	Online	/ Insen	n	1	Endsen	n
Practical / Tutor	ial	T	W						T	W	O	R	P	R	
CO - PO Mappi	ng														
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
410252 CO1	3	3	2	2	3	2	1	1	1	1	1	1	3	2	_
410252 CO2	3	3	2	2	2	1	_	1	-	1	1	1	3	3	_
410252 CO3	3	3	3	3	1	1	1	1	1	1	2	1	3	3	_
410252 CO4	2	3	2	2	3	1	1	1	1	2	1	2	2	3	_
410252 CO5	2	3	3	3	_	2	2	2	1	2	2	3	3	3	_
410252 CO6	2	3	3	3	3	2	2	1	2	2	1	3	3	3	_
410252	2.50	3.00	2.50	2.50	2.40	1.50	1.40	1.17	1.20	1.50	1.33	1.83	2.83	2.83	0.00
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CO- PO mapping	is done	with c	orelatio	n level	1, 2, 3	and —	-		_	_	CREATE S	reduce new or only	girad swarfs rues, sompressure, dissu	tiop. Formulate, author	. investigane
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2: Moderately (Mediun	n)							1	-	AMALYSE	differentiate experiment	enganisal relate from question, but formation in new	pare, combast, distings	ash, marries.

Course Co-ordinator

3 : Substantionally (High)

: No corelation between CO and PO

SES

Director / Principal

Savitribai Phule Pune University Fourth Year of Computer Engineering (2015 Course) Elective IV

410253(C): Cloud Computing

Teaching Scheme: Credit Examination Scheme:

TH: 03 Hours/Week 03 In-Sem (Paper): 30 Marks End-Sem (Paper): 70 Marks

Prerequisite Courses: 310245 Computer Networks
Companion Course: 410255-Laboratory Practice IV

Course Objectives:

To understand cloud computing concepts;

- · To study various platforms for cloud computing
- To explore the applications based on cloud computing

Course Outcomes:

On completion of the course, student will be able to-

- To install cloud computing environments.
- · To develop any one type of cloud
- To explore future trends of cloud computing



SINHGAD TECHNICAL EDUCATION SOCIETY'S NBN SINHGAD TECHNICAL INSTITUES CAMPUS NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41 DEPARTMENT OF COMPUTER ENGINEERING

				(Course	Arti	culatio	n Ma	trix						
Course Title:	Cloud	Comp	uting								SPPU (Course	Code:	41025	3
Designation of C	ourse:	Electiv	ve												
Class: BE Co	mpute	r						Sen	nester:	VIII			AY:	2021 -	22
Teaching Schem	e														
Assessment Tool	l		In	ternal .	Assessr	nent T	ool			Ex	ternal	Assessi	ment T	ool	
Theory		Unit	Test	Assig	nment	/ Tuto	Prelim	Exam		Online	/ Insen	n]	Endsen	n
Practical / Tutor	ial	T	W						T	W	O	R	P	R	
CO - PO Mappi	ng														
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO ₃
410253 CO1	3	3	2	3	2	3	2	2	-	_	_	2	2	2	_
410253 CO2	3	2	2	2	1	-	_	_	_	_	_	3	3	3	_
410253 CO3	3	3	2	3	2	2	1	3	3	_	_	3	2	3	_
410253 CO4	3	3	2	_	_	1	1	_	_	_	_	2	2	3	_
410253 CO5	3	3	2	3	2	2	2	1	-	-	-	3	3	-	_
410253 CO6	3	3	2	2	2	1	1	_	_	-	_	1	_	2	_
410253	3.00	2.83	2.00	2.60	1.80	1.80	1.40	2.00	3.00	0.00	0.00	2.33	2.40	2.60	0.00
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CO- PO mapping	is done	with c	orelatio	n level	1, 2, 3	and —	-		- 1	4	CREATE Pro	hatib a steed or		p. formulate, author, i	investigate

Course Co-ordinator

1: Slightly (low)

2 : Moderately (Medium) 3 : Substantionally (High)

No corelation between CO and PO

SES

Director / Principal

Savitribai Phule Pune University Fourth Year of Computer Engineering (2015 Course) 410254:Laboratory Practice III

Teaching Scheme: Credit Examination Scheme:

Practical: 04 Hours/Week 02 Term Work: 50 Marks
Practical: 50 Marks

Companion Courses: 410250 and 410251

Course Objectives and Outcomes: Practical hands on is the absolute necessity as far as employability of the learner is concerned. The presented course is solely intended to enhance the competency by undertaking the laboratory assignments of the core courses.



SINHGAD TECHNICAL EDUCATION SOCIETY'S NBN SINHGAD TECHNICAL INSTITUES CAMPUS NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41

DEPARTMENT OF COMPUTER ENGINEERING

				-	Course	Artic	rulatio	on Ma	frix						
Course Title:	Labor	atory I	Practic		Jourse	- 111 ta	·······	/II 1710	u La		SPPU	Course	Code:	-	410254
Designation of C															
	mpute		•					Sen	ester:	VIII			AY:	2021 -	22
Teaching Schem															
Assessment Tool			In	ternal .	Assessi	nent T	ool			Ex	ternal	Assessi	ment T	ool	
Theory		Unit	Test	Assign	nment	/ Tuto	Prelim	Exam		Online	/ Insen	n]	Endsen	n
Practical / Tutor	ial	T	W						T	W	0	R	P	R	
CO - PO Mappi	ng														
CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
410254 CO1	3	3	3	2	3	2	1	0	0	0	0	1	3	3	-
410254 CO2	3	3	2	3	3	2	1	0	0	0	0	1	3	3	-
410254 CO3	3	3	3	2	3	2	1	0	0	0	0	1	3	3	-
410254 CO4	3	3	3	2	3	2	1	0	0	0	0	1	2	2	-
410254 CO5	3	2	3	3	3	2	1	0	0	0	0	1	3	3	-
410254 CO6	3	3	3	3	3	2	1	0	0	0	0	1	3	3	-
0	3.00	2.83	2.83	2.50	3.00	2.00	1.00	0.00	0.00	0.00	0.00	1.00	2.83	2.83	0.00
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Course Co-ordinator

Program Co-ordinator

Savitribai Phule Pune University Fourth Year of Computer Engineering (2015 Course) 410255:Laboratory Practice IV

Teaching Scheme: Credit Examination Scheme: Term Work: 50 Marks Practical: 04 Hours/Week Presentation: 50 Marks

Companion Courses: 410252 and 410253

Course Objectives and Outcomes: Practical hands on is the absolute necessity as far as employability of the learner is concerned. The presented course is solely intended to enhance the competency by undertaking the laboratory assignments of the elective courses. Enough choice is provided to the learner to choose an elective of one's interest.

Laboratory Practice II is companion lab for elective course III and elective course IV.



SINHGAD TECHNICAL EDUCATION SOCIETY'S

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NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41

DEPARTMENT OF COMPUTER ENGINEERING

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Course Title:											SPPU	Course	Code:	4	410255
Designation of C			Subject	S											
1	mpute	r						Sen	iester:	VIII			AY:	2021 -	22
Teaching Schem	ie														
Assessment Tool	l		In	ternal .	Assessi	nent T	ool			Ex	ternal	Assessi	ment T	ool	
Theory		Unit	Test	Assig	nment	/ Tuto	Prelim	Exam		Online	/ Inser	n]	Endsen	n
Practical / Tutor	rial	T	W						T	W	C	R	P	R	
CO - PO Mappi	ing														
CO / PO PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 PSO1 PSO2 PSO															PSO3
410255 CO1	3	3	2	0	2	1	1	2	3	2	1	3	-	-	-
410255 CO2	3	3	3	3	2	1	0	2	2	1	1	1	2	-	-
410255 CO3	3	3	3	2	2	1	1	1	2	0	1	1	-	1	-
410255 CO4	2	2	2	1	3	2	2	3	3	1	1	0	-	-	-
410255 CO5	1	1	1	1	3	3	2	2	1	0	1	1	1	-	-
410255 CO6	3	3	3	2	2	2	1	1	1	1	0	0	-	-	-
0	2.50	2.50	2.33	1.50	2.33	1.67	1.17	1.83	2.00	0.83	0.83	1.00	1.50	1.00	0.00
					•				Evaluate	tion of 60 wi	Bloc	om a point a		oom's Taxone	eny
CO- PO mapping	is done	with c	orelatio	n level	1, 2, 3	and —			_		Pr	oduce new or origi	rai wark		
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Course Co-ordinator

Savitribai Phule Pune University Fourth Year of Computer Engineering (2015 Course) 410256:Project Work Stage II

Teaching Scheme: Credit Examination Scheme: 06

Practical: 06 Hours/Week Term Work: 100 Marks
Presentation: 50 Marks

Course Objectives:

- To follow SDLC meticulously and meet the objectives of proposed work
- · To test rigorously before deployment of system
- To validate the work undertaken
- To consolidate the work as furnished report.

Course Outcomes:

On completion of the course, student will be able to-

- · Show evidence of independent investigation
- Critically analyze the results and their interpretation.
- Report and present the original results in an orderly way and placing the open questions in the right perspective.
- Link techniques and results from literature as well as actual research and future research lines with the research.
- · Appreciate practical implications and constraints of the specialist subject



SINHGAD TECHNICAL EDUCATION SOCIETY'S NBN SINHGAD TECHNICAL INSTITUES CAMPUS NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41 DEPARTMENT OF COMPUTER ENGINEERING

					Course	Artic	culatio	on Ma	trix						
Course Title:	Projec	t Worl	s Stage	II							SPPU (Course	Code:	4	110256
Designation of C	ourse:	Projec	t work	:											
Class: BE Co	mputer							Sen	nester:	VIII			AY:	2021 -	22
Teaching Scheme	e														
Assessment Tool			In	ternal .	Assessi	nent T	ool			Ex	ternal	Assessi	ment T	ool	
Theory		Unit	Test	Assign	nment	/ Tuto	Prelim	Exam	•	Online	/ Insen	n]	Endsen	n
Practical / Tutor		T	W						T	W	0	R	P	R	
CO - PO Mappi															
CO / PO PO1 PO2 PO3 PO4 PO5 PO6 PO7 PO8 PO9 PO10 PO11 PO12 PSO1 PSO2 PSO 410256 CO1 3 3 3 3 2 3 2 2 2 2 2 2 2 2 2 2 2 2 2															PSO3
410256 CO1	3	3	3	3	2	3	2	2	-	_	_	2	2	2	_
410256 CO2	2	2	2	2	1	_	_	_	-	_	_	1	3	3	_
410256 CO3	3	3	2	3	2	2	2	3	2	_	_	2	2	2	_
410256 CO4	2	3	3	_	-	1	1	_	-	_	_	2	2	3	2
410256 CO5	3	3	2	3	2	2	2	2	ı	_	_	3	1	-	_
410256 CO6	3	3	2	2	2	2	1	_	_	_	_	1	_	2	_
0	2.67	2.83	2.33	2.60	1.80	2.00	1.60	2.33	2.00	0.00	0.00	1.83	2.00	2.40	2.00
									2731331	2000 OF CO W		om's Tax			,
CO- PO mapping	is done	with c	orelatio	n level	1, 2, 3	and —	-		_	_	CREATE !	Troduce new or or	iginal work erust serjecture des	otop. formulate, author	n, incentigans
1 : Slightly (low)									_	1	ENALUATE		meteral justipe, unless, o		- manight
2: Moderately (1	Medium	1)							2		AMALYSE	differentials	to the state of th	rysans, combust, disting	sish ssamine.
3 : Substantionally	y (High)							- 3		APPLY	Stanford St. Predi	to implement to be	and district of the last	gran operate,
- : No corelation	n betwe	en CO	and PC)					1 4		DENGMEN		Therefor checkles, disco- region, unless, manufact		cate, recognise.

Course Co-ordinator

SES

Director / Principal



SINHGAD TECHNICAL EDUCATION SOCIETY'S

NBN SINHGAD TECHNICAL INSTITUES CAMPUS

NBN Sinhgad School of Engineering, Ambegaon, Pune -41. DEPARTMENT OF COMPUTER ENGINEERING PROGRAM ARTICULATION MATRIX

Academic Year: 2021 - 22

Sr. No.	Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	110005	2.00	2.00	3.00	1.33	2.50	0.00	0.00	0.00	1.00	3.00	0.00	1.33	1.00	1.00	1.00
2	210241	3.00	3.00	3.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	1.00	1.00
3	210242	2.17	2.33	2.50	2.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.67	1.50	1.00
4	210243	2.25	2.00	2.50	1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00
5	210244	1.50	1.50	1.25	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00
6	210245	3.00	1.33	2.50	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00
7	210247	2.00	2.00	2.00	1.50	2.00	1.50	1.67	0.83	1.83	1.50	0.33	1.83	1.00	1.00	1.00
8	210248	2.50	2.33	2.17	2.00	2.17	2.50	2.00	2.00	2.50	2.00	1.83	2.17	1.00	1.00	1.00
9	210249	1.17	1.50	1.33	1.50	1.00	0.80	0.80	1.00	0.50	1.17	1.00	0.67	2.50	2.67	2.50
10	210250	1.50	1.50	1.25	1.00	1.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00
11	210246	0.00	0.00	0.00	0.00	0.00	0.00	3.00	2.25	2.33	0.00	0.00	1.00	1.00	1.00	1.00
12	310241	2.00	2.00	0.00	0.00	0.00	0.00	1.00	0.00	2.00	0.00	1.00	1.00	1.00	0.00	0.00
13	310242	3.00	3.00	2.33	2.17	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.33	1.00	1.00	1.00
14	310243	2.00	1.67	1.50	1.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00
15	310244	1.33	1.75	1.40	1.40	1.60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16	310245A	2.17	2.00	1.67	2.33	2.20	2.75	0.00	1.00	1.60	1.00	1.40	1.67	1.00	1.00	1.00
17	310246	2.00	1.33	2.50	0.00	2.33	1.00	1.33	1.00	3.00	1.33	1.33	1.25	1.00	1.00	1.00
18	310247	2.00	2.00	2.00	1.00	1.20	1.00	1.00	1.00	1.50	1.00	1.00	1.00	1.00	1.00	1.00
19	310248	1.17	2.00	2.17	1.67	2.33	2.00	0.00	0.00	2.33	1.50	1.67	1.00	1.00	1.00	1.00
20	310249	1.50	1.25	1.75	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00
21	410241	1.67	1.50	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00
22	410242	3.00	2.00	3.00	2.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	3.00	2.00	0.00
23	410243	3.00	2.00	3.00	3.00	3.00	2.00	2.00	3.00	3.00	3.00	2.00	2.00	2.00	3.00	1.00
24	410244 (D)	2.50	1.75	2.00	1.50	1.00	1.50	0.00	0.00	0.00	0.00	0.00	1.50	1.00	1.00	1.00
25	410245 (B)	1.33	1.80	1.83	2.17	2.17	1.00	1.00	1.33	1.83	1.17	1.67	1.00	1.00	1.00	0.00
26	410246	3.00	2.83	2.33	3.00	2.17	2.17	2.33	1.00	1.75	1.00	3.00	2.00	0.00	1.50	0.00
27	410247	3.00	2.33	2.67	2.83	1.83	2.50	1.80	1.75	1.80	2.25	2.50	2.50	2.17	1.75	0.00
28	410248	1.50	2.75	2.00	3.00	2.75	1.75	1.25	2.50	2.25	2.00	1.75	3.00	2.50	2.25	1.50
29	110005	2.67	2.00	2.17	1.83	2.17	2.17	2.17	1.67	1.50	1.67	1.50	2.17	2.50	1.67	2.00
30	210252	2.50	2.80	2.20	1.25	2.60	1.00	1.00	0.00	0.00	0.00	1.50	1.50	2.83	1.40	1.25
31	210253	2.00	2.00	2.00	1.00	3.00	3.00	3.00	1.00	1.00	1.00	1.00	2.00	3.00	2.00	1.00
32	210254	2.00	1.00	0.00	0.00	1.33	0.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00



SINHGAD TECHNICAL EDUCATION SOCIETY'S

NBN SINHGAD TECHNICAL INSTITUES CAMPUS

NBN Sinhgad School of Engineering, Ambegaon, Pune -41. DEPARTMENT OF COMPUTER ENGINEERING

PROGRAM ARTICULATION MATRIX Academic Year: 2021 - 22

Sr. No.	Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
33	210255	2.00	2.00	1.75	1.75	2.00	0.00	0.00	0.00	2.00	1.75	2.00	0.00	1.00	1.00	1.00
34	210256	3.00	2.83	2.83	2.83	2.67	1.67	1.00	2.33	2.00	1.00	2.67	3.00	1.00	1.00	1.00
35	210257	2.83	2.33	2.67	2.00	2.33	1.17	1.17	1.00	1.33	1.00	1.00	2.00	1.00	1.00	1.00
36	210258	3.00	2.33	1.67	2.00	1.83	2.17	2.00	1.00	1.50	1.67	1.00	1.67	1.00	1.00	1.00
37	210260	2.83	2.00	2.67	0.00	1.83	2.33	3.00	0.00	2.00	2.00	0.00	2.00	1.00	1.00	1.00
38	210259	1.33	1.33	1.00	0.00	0.50	0.50	0.50	0.50	2.00	0.50	0.50	1.00	1.00	1.00	1.00
39	310251	1.17	2.00	1.67	1.50	2.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00
40	310252	1.40	1.60	1.60	1.80	1.60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
41	310253	1.33	2.17	2.17	1.33	2.00	1.00	1.00	3.00	1.00	2.00	0.00	0.00	1.00	1.00	1.00
42	310254A	3.00	2.80	1.80	2.40	0.00	2.00	1.00	1.50	0.00	1.00	1.00	1.00	1.00	1.00	1.00
43	310255	1.67	2.00	2.00	2.00	3.00	1.33	1.50	1.50	1.40	1.50	1.50	1.17	1.00	1.00	1.00
44	310256	2.00	2.00	2.00	2.00	2.17	2.00	0.00	0.00	0.00	0.00	3.00	0.00	1.00	1.00	1.00
45	310257	1.67	1.67	2.67	1.33	1.50	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
46	310258	1.17	0.00	2.00	2.00	3.00	2.00	0.00	2.00	2.00	2.00	1.67	2.00	1.00	1.00	1.00
47	410250	2.00	1.75	2.00	1.17	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
48	410251	3.00	2.67	2.50	2.83	2.50	1.33	1.33	1.50	1.00	1.40	2.50	2.50	2.17	2.00	0.00
49	410252	2.50	3.00	2.50	2.50	2.40	1.50	1.40	1.17	1.20	1.50	1.33	1.83	2.83	2.83	0.00
50	410253	3.00	2.83	2.00	2.60	1.80	1.80	1.40	2.00	3.00	0.00	0.00	2.33	2.40	2.60	0.00
51	410254	3.00	2.83	2.83	2.50	3.00	2.00	1.00	0.00	0.00	0.00	0.00	1.00	2.83	2.83	0.00
52	410255	2.50	2.50	2.33	1.50	2.33	1.67	1.17	1.83	2.00	0.83	0.83	1.00	1.50	1.00	0.00
53	410256	2.67	2.83	2.33	2.60	1.80	2.00	1.60	2.33	2.00	0.00	0.00	1.83	2.00	2.40	2.00
Ave	rage PO	2.18	2.09	2.14	1.89	2.00	1.61	1.47	1.53	1.68	1.46	1.47	1.53	1.41	1.34	1.10
% 1	Average	72.75	69.77	71.43	63.04	66.63	53.60	48.91	51.11	56.01	48.68	48.97	50.99	47.05	44.71	36.63

eme

Course Co-ordinator

BKG.

Principal / Director



Course:

410253(C) CC

SINHGAD TECHNICAL EDUCATION SOCIETY'S

NBN SINHGAD TECHNICAL INSTITUES CAMPUS

NBN Sinhgad School of Engineering, Ambegaon, Pune -41.

Department of Mechanical Engineering

Class: BE

Cour	ьс.	410255(C)			CO1										1											
Acade	emic Year	Semester	Course Outcomes							CO1											CO2					
			Type of Assessment			Ir	iternal	la/ a				Externa						ternal						ernal	0/ 0	
202	21 - 22	I	Assessment Tools	UT1	TW		ASSI/ TUT	% of all tools	Students Attained	IN SEM	OR / ENI PR SEM	TW	% of all tools	Students	UT1	TW	PREL IM	ASSI/ TUT	% of all tools	Students Attained	IN SEM	OR / PR	END SEM	TW	% of all tools	Students Attained
Sr.	ROLL	EXAM	Total Marks	30	0			30.00	Y/N	30	50 0	50	130.00	Y/N	30	0	0	0	30.00	Y/N	30	50	0	50	130.00	Y/N
No	NO.	SEAT NO.	Name of the Students		Α	vg. R	elevant l	Marks %	66		Avg	g. Releva	nt Marks %	66		A	vg. Re	levant l	Marks %	66		Avg. Re	elevant I	Marks %		66
1	B5546	B151054201	ABHINAV SINHA PRERNA SINH	29				97	Y	27	42	43	86	Y	29				97	Y	27	42		43	86	Y
2	B5557	B151054202	ABHISHEK VAISHYA SANGITA	26				87	Y	27	43	44	88	Y	26				87	Y	27	43		44	88	Y
3	B5401	B151054203	ADMANE AJINKYA PRADIPKUMA	16				53	N	29	44	43	89	Y	16				53	N	29	44		43	89	Y
4	B5402	B151054204	AJMERI ISHAN RAKESHCHANDR	28				93	Y	24	41	4:	82	Y	28				93	Y	24	41		41	82	Y
5	B5451	B151054205	AKASH GUPTA GEETA 7192200	28				93	Y	26	42	43	85	Y	28				93	Y	26	42		43	85	Y
6	B5492	B151054206	AKASH MAURYA VIDYA MAURYA	29				97	Y	29	43	44	89	Y	29				97	Y	29	43		44	89	Y
7	B5558	B151054207	AKHIL V SATHI VARIER M.V.	28				93	Y	29	43	42	88	Y	28				93	Y	29	43		42	88	Y
8	B5551	B151054208	ALISH SULKIYA PUSHPA SULK	25				83	Y	27	42	4:	85	Y	25				83	Y	27	42		41	85	Y
9	B5403	B151054209	ALLEPALLY PRANAY VEERABRA	28				93	Y	29	44	44	90	Y	28				93	Y	29	44		44	90	Y
10	B5510	B151054210	AMRITESH PANDEY SAVITA 71	0				0	N	27	41	42	85	Y	0				0	N	27	41		42	85	Y
11	B5439	B151054211	ANIMESH GAHARWAR PRATIBHA	28				93	Y	28	42	43	87	Y	28				93	Y	28	42		43	87	Y
12	B5404	B151054212	ANPAT ROHIT SHANKAR SAVIT	0				0	N	28	43	44	88	Y	0				0	N	28	43		44	88	Y
13	B5481	B151054213	ANSHULI KUMARI SUDHA KUMA	29				97	Y	29	43	43	88	Y	29				97	Y	29	43		43	88	Y
14	B5421	B151054214	APURVA CHATURVEDI MEENA C	27				90	Y	27	43	45	88	Y	27				90	Y	27	43		45	88	Y
15	B5405	B151054215	ARGADE OMKAR CHANDRAKANT	29				97	Y	28	44	43	88	Y	29				97	Y	28	44		43	88	Y
16	B5544	B151054216	ASHISH KUMAR SRIVASTVA US	28				93	Y	27	42	44	87	Y	28				93	Y	27	42		44	87	Y
17	B5417	B151054217	ATHARV SHASHIKANT BIRARI	28				93	Y	27	43	4:	85	Y	28				93	Y	27	43		41	85	Y
18	B5406	B151054218	AUNDHKAR AAKASH AVINASH A	28				93	Y	27	44	45	89	Y	28				93	Y	27	44		45	89	Y
19	B5407	B151054219	BANKAR NIRANJAN ANANDRAO	29				97	Y	27	43	45	88	Y	29				97	Y	27	43		45	88	Y
21	B5410	B151054221	BHARUKA AMAN ANKALESH KAN	29					Y	29	41	4:	85	Y	29				97	Y	29	41		41	85	Y
22	B5411	B151054222	BHAVE SAURABH RAKESH REKH	29				97	Y	28	42	43	87	Y	29				97	Y	28	42		43	87	Y
23	B5412	B151054223	BHAVSAR SIDDHARTH KAILAS	28				93	Y	24	42	43	84	Y	28				93	Y	24	42		43	84	Y
24	B5413	B151054224	BHORE ANIKET DURGADAS PRE	29				97	Y	29	43	44		Y	29				97	Y	29	43		44	89	Y
25	B5414	B151054225	BHUJBAL RUSHIKESH BHASKAR	29				97	Y	26	42	43	85	Y	29				97	Y	26	42		43	85	Y
26	B5418	B151054226	BORAWAKE KANCHAN MANGESH	28				93	Y	28	40	42	85	Y	28				93	Y	28	40		42	85	Y
27	B5419	B151054227	CHAHAL GAURAV DILIP SAVIT	26				87	Y	28	41	44	87	Y	26				87	Y	28	41		44	87	Y
28	B5420	B151054228	CHAND SIDHARTH SHAILESH S	29				97	Y	28	41	43	86	Y	29				97	Y	28	41		43	86	Y
29	B5423	B151054229	CHAUDHARI GHANSHYAM MADAN	28				93	Y	29	42	43	88	Y	28				93	Y	29	42		43	88	Y
30	B5424	B151054230	CHAVAN PRATHMESH MANOJ CH	29				97	Y	29	43	42	88	Y	29				97	Y	29	43		42	88	Y
		ı	Total	4281.0	0.0	0.0	0.0	14270.0	152.0	4488.0	6935.0 0.0	9641.0	#VALUE!	162.0	4281.0	0.0	0.0	0.0	14270.0	153.0	4570.0	6935.0	0.0	7083.0	14298.5	164.0
			Average	26.76	0.00	0.00	0.00	89.19		19.86	30.69 0.00	0 42.66	#VALUE!		26.76	0.00	0.00	0.00	89.19		27.04	41.04	0.00	41.91	84.61	
													•	•						•						
		•	Attainment Level			Tot	al No fo	Students	160					226			Tota	l No fo	Students	160						169
If % A	Attainment	<=50, Level o	obtained = 1 (Low)			No o	f students	achieved	152					162			No of s	tudents	achieved	153	1					164
If % A	Attainment	>50 & <66, L	evel obtained = 2 (Medium)						95.00					71.68				% A	ttainment	95.63	1					97.0
If % A	Attainment	>=66, Level o	obtained = 3 (High)	% Attainment 9 Attainment level					3					3			At	tainme	ent level	3	1					3
				Attainment icves																						
										A	Internal Att	ainment	Level (20%)	0.60							A.	. Internal	Attainn	nent Leve	el (20%)	0.60
										External Att	ainment	Level (80%)	2.4							В. 1	External	Attainn	nent Leve	el (80%)	2.4	
										T	otal CO1 At	tainment	level (A+B	3.00							T	otal CO2	2 Attain	ment leve	el (A+B)	3.00
											Fin	al CO At	tainment leve	el 2.73												
	A V	% RESULT						-	Sap Ana	lveie					_											
	AY						,	,			, ,				-											
	2017 - 18	78				253(C)	CO		CO1	CO2	CO3 CO	4 CO5	CO6	CO												
	2018 - 19	82	To measure course outcomes attained level through University examination are obtained by	Target 1	Level				1.98	1.98	1.98 1.99	8 1.98	1.98	1.98												
	2019 - 20	68.00	using precribed levels defined by program.	Attaine	d Leve	el			3.00	3.00	2.60 2.60	0 2.60	2.60	2.73												
Targ	get Value	76		Action 1	Requi	red (Y	/N)		N	N	N N	N	N	N												
			•										-	-	_											

DIV-1 Page 1 of 1



SINHGAD TECHNICAL EDUCATION SOCIETY'S NBN SINHGAD TECHNICAL INSTITUES CAMPUS NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41

DEPARTMENT OF COMPUTER ENGINEERING CO ATTAINMENT

Academic Year: 2021 - 22

Sr. No.	Course	CO1	CO2	CO3	CO4	CO5	CO6	CO
26	410246	3.00	3.00	3.00	3.00	3.00	3.00	3.00
27	410247	3.00	3.00	3.00	3.00	3.00	3.00	3.00
28	410248	3.00	3.00	3.00	3.00	3.00	3.00	3.00
29	110005	3.00	3.00	3.00	3.00	3.00	3.00	3.00
30	210252	3.00	2.60	3.00	3.00	2.60	3.00	2.87
31	210253	3.00	3.00	3.00	3.00	3.00	3.00	3.00
32	210254	3.00	3.00	3.00	3.00	3.00	3.00	3.00
33	210255	3.00	3.00	3.00	3.00	3.00	3.00	3.00
34	210256	3.00	3.00	3.00	3.00	3.00	3.00	3.00
35	210257	3.00	3.00	3.00	3.00	3.00	3.00	3.00
36	210258	3.00	2.60	3.00	3.00	3.00	3.00	2.93
37	210260	3.00	3.00	3.00	3.00	3.00	3.00	3.00
38	210259	3.00	3.00	3.00	3.00	3.00	2.60	2.93
39	310251	3.00	3.00	3.00	3.00	3.00	3.00	3.00
40	310252	3.00	3.00	3.00	3.00	3.00	3.00	0.73
41	310253	3.00	3.00	3.00	3.00	3.00	3.00	3.00
42	310254A	3.00	3.00	3.00	3.00	3.00	3.00	3.00
43	310255	3.00	3.00	3.00	3.00	3.00	3.00	3.00
44	310256	3.00	2.60	3.00	3.00	3.00	3.00	2.93
45	310257	3.00	3.00	3.00	3.00	2.60	3.00	2.93
46	310258	3.00	3.00	3.00	2.60	3.00	3.00	2.93
47	410250	2.60	3.00	3.00	3.00	3.00	3.00	2.93
48	410251	3.00	3.00	3.00	3.00	3.00	2.80	2.97
49	410252	2.60	3.00	3.00	3.00	3.00	3.00	2.93
50	410253	3.00	3.00	2.40	3.00	3.00	3.00	2.90



SINHGAD TECHNICAL EDUCATION SOCIETY'S NBN SINHGAD TECHNICAL INSTITUES CAMPUS NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41

DEPARTMENT OF COMPUTER ENGINEERING CO ATTAINMENT

Academic Year: 2021 - 22

Sr. No.	Course	CO1	CO2	CO3	CO4	CO5	CO6	CO
1	110005	3.00	3.00	3.00	2.60	2.60	2.60	2.80
2	210241	3.00	3.00	3.00	2.60	2.60	2.60	2.80
3	210242	3.00	3.00	3.00	2.60	3.00	3.00	3.00
4	210243	3.00	3.00	3.00	3.00	3.00	3.00	3.00
5	210244	3.00	3.00	3.00	3.00	3.00	3.00	3.00
6	210245	3.00	3.00	3.00	2.60	3.00	3.00	2.93
7	210247	2.60	2.60	3.00	3.00	3.00	3.00	2.87
8	210248	3.00	3.00	3.00	3.00	3.00	3.00	3.00
9	210249	2.60	2.60	3.00	3.00	3.00	3.00	2.87
10	210250	3.00	3.00	3.00	3.00	3.00	3.00	3.00
11	210246	3.00	3.00	2.40	3.00	3.00	3.00	2.90
12	310241	3.00	3.00	3.00	2.60	3.00	3.00	2.93
13	310242	3.00	3.00	3.00	3.00	3.00	3.00	3.00
14	310243	3.00	3.00	3.00	3.00	3.00	3.00	3.00
15	310244	3.00	3.00	3.00	3.00	3.00	3.00	3.00
16	310245A	3.00	3.00	3.00	3.00	3.00	3.00	3.00
17	310246	3.00	3.00	3.00	3.00	3.00	3.00	3.00
18	310247	3.00	3.00	3.00	3.00	3.00	3.00	3.00
19	310248	3.00	3.00	2.60	3.00	3.00	3.00	2.93
20	310249	3.00	3.00	3.00	3.00	3.00	3.00	3.00
21	410241	3.00	3.00	3.00	3.00	3.00	3.00	3.00
22	410242	3.00	3.00	3.00	3.00	3.00	3.00	3.00
23	410243	3.00	3.00	3.00	3.00	3.00	3.00	3.00
24	410244 (D)	3.00	3.00	3.00	3.00	3.00	3.00	3.00
25	410245 (B)	3.00	3.00	3.00	3.00	3.00	3.00	3.00



SINHGAD TECHNICAL EDUCATION SOCIETY'S

NBN SINHGAD TECHNICAL INSTITUES CAMPUS NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41

DEPARTMENT OF COMPUTER ENGINEERING CO ATTAINMENT

Academic Year: 2021 - 22

Sr. No.	Course	CO1	CO2	CO3	CO4	CO5	CO6	СО
51	410254	3.00	3.00	3.00	3.00	3.00	2.60	2.93
52	410255	3.00	3.00	3.00	3.00	3.00	2.60	2.93
53	410256	3.00	3.00	3.00	3.00	3.00	2.60	2.93
Avei	rage	2.97	2.96	2.97	2.95	2.97	2.97	
% Av	erage	98.93	98.67	98.93	98.40	98.93	99.07	

Course Co-ordinator

Program Co-ordinator

Principal / Director

PO and PSO Attainment

Calculating PO attainment for direct method

The PO attainment is calculated by using the predefined CO/PO matrix and the value of Final CO attainment for the subject

The PO attainment is calculated by using the formula

PO attainment = Avg, of CO's of a PO /3 **X** Final CO attainment for the subject

For Example, if you want to calculate the PO attainment value for PO1 in the below table

PO attainment for PO1 = (Avg. of CO's for PO1 / 3) \mathbf{X} 2.97

PO attainment for PO1 = 2.97



SINHGAD TECHNICAL EDUCATION SOCIETY'S

NBN SINHGAD TECHNICAL INSTITUES CAMPUS

NBN Sinhgad School of Engineering, Ambegaon, Pune -41. DEPARTMENT OF COMPUTER ENGINEERING PO ATTAINMENT

Academic Year: 2021 - 22

Direct PO Attainment

Directio	Attailillent															
Sr. No.	Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	110005	1.87	1.87	2.80	1.24	2.33	0.00	0.00	0.00	0.93	2.80	0.00	1.24	0.93	0.93	0.93
2	210241	2.80	2.80	2.80	1.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.40	0.93	0.93
3	210242	2.17	2.33	2.50	2.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.67	1.50	1.00
4	210243	2.25	2.00	2.50	1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00
5	210244	1.50	1.50	1.25	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00
6	210245	2.93	1.30	2.44	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98	0.98	0.98
7	210247	1.91	1.91	1.91	1.43	1.91	1.43	1.59	0.80	1.75	1.43	0.32	1.75	0.96	0.96	0.96
8	210248	2.50	2.33	2.17	2.00	2.17	2.50	2.00	2.00	2.50	2.00	1.83	2.17	1.00	1.00	1.00
9	210249	1.12	1.43	1.27	1.43	0.96	0.76	0.76	0.96	0.48	1.12	0.96	0.64	2.39	2.55	2.39
10	210250	1.50	1.50	1.25	1.00	1.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00
11	210246	0.00	0.00	0.00	0.00	0.00	0.00	2.90	2.18	2.26	0.00	0.00	0.97	0.97	0.97	0.97
12	310241	1.96	1.96	0.00	0.00	0.00	0.00	0.98	0.00	1.96	0.00	0.98	0.98	0.98	0.00	0.00
13	310242	3.00	3.00	2.33	2.17	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.33	1.00	1.00	1.00
14	310243	2.00	1.67	1.50	1.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00
15	310244	1.33	1.75	1.40	1.40	1.60	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16	310245A	2.17	2.00	1.67	2.33	2.20	2.75	0.00	1.00	1.60	1.00	1.40	1.67	1.00	1.00	1.00
17	310246	2.00	1.33	2.50	0.00	2.33	1.00	1.33	1.00	3.00	1.33	1.33	1.25	1.00	1.00	1.00
18	310247	2.00	2.00	2.00	1.00	1.20	1.00	1.00	1.00	1.50	1.00	1.00	1.00	1.00	1.00	1.00
19	310248	1.14	1.96	2.12	1.63	2.28	1.96	0.00	0.00	2.28	1.47	1.63	0.98	0.98	0.98	0.98
20	310249	1.50	1.25	1.75	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00
21	410241	1.67	1.50	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00
22	410242	3.00	2.00	3.00	2.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00	3.00	2.00	0.00
23	410243	3.00	2.00	3.00	3.00	3.00	2.00	2.00	3.00	3.00	3.00	2.00	2.00	2.00	3.00	1.00
24	410244 (D)	2.50	1.75	2.00	1.50	1.00	1.50	0.00	0.00	0.00	0.00	0.00	1.50	1.00	1.00	1.00
25	410245 (B)	1.33	1.80	1.83	2.17	2.17	1.00	1.00	1.33	1.83	1.17	1.67	1.00	1.00	1.00	0.00
26	410246	3.00	2.83	2.33	3.00	2.17	2.17	2.33	1.00	1.75	1.00	3.00	2.00	0.00	1.50	0.00
27	410247	3.00	2.33	2.67	2.83	1.83	2.50	1.80	1.75	1.80	2.25	2.50	2.50	2.17	1.75	0.00
28	410248	1.50	2.75	2.00	3.00	2.75	1.75	1.25	2.50	2.25	2.00	1.75	3.00	2.50	2.25	1.50
29	110005	2.67	2.00	2.17	1.83	2.17	2.17	2.17	1.67	1.50	1.67	1.50	2.17	2.50	1.67	2.00
30	210252	2.39	2.68	2.10	1.19	2.48	0.96	0.96	0.00	0.00	0.00	1.43	1.43	2.71	1.34	1.19
31	210253	2.00	2.00	2.00	1.00	3.00	3.00	3.00	1.00	1.00	1.00	1.00	2.00	3.00	2.00	1.00
32	210254	2.00	1.00	0.00	0.00	1.33	0.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00
33	210255	2.00	2.00	1.75	1.75	2.00	0.00	0.00	0.00	2.00	1.75	2.00	0.00	1.00	1.00	1.00
34	210256	3.00	2.83	2.83	2.83	2.67	1.67	1.00	2.33	2.00	1.00	2.67	3.00	1.00	1.00	1.00
35	210257	2.83	2.33	2.67	2.00	2.33	1.17	1.17	1.00	1.33	1.00	1.00	2.00	1.00	1.00	1.00
36	210258	2.93	2.28	1.63	1.96	1.79	2.12	1.96	0.98	1.47	1.63	0.98	1.63	0.98	0.98	0.98
37	210260	2.83	2.00	2.67	0.00	1.83	2.33	3.00	0.00	2.00	2.00	0.00	2.00	1.00	1.00	1.00
38	210259	1.30	1.30	0.98	0.00	0.49	0.49	0.49	0.49	1.96	0.49	0.49	0.98	0.98	0.98	0.98
39	310251	1.17	2.00	1.67	1.50	2.00	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00
40	310252	0.34	0.39	0.39	0.44	0.39	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24



SINHGAD TECHNICAL EDUCATION SOCIETY'S

NBN SINHGAD TECHNICAL INSTITUES CAMPUS

NBN Sinhgad School of Engineering, Ambegaon, Pune -41. DEPARTMENT OF COMPUTER ENGINEERING PO ATTAINMENT

Academic Year: 2021 - 22

DPOA	46	2.14	2.04	2.09	1.84	1.95	1.57	1.43	1.49	1.64	1.42	1.43	1.50	1.38	1.31	1.07
53	410256	2.61	2.77	2.28	2.54	1.76	1.96	1.56	2.28	1.96	0.00	0.00	1.79	1.96	2.35	1.96
52	410255	2.44	2.44	2.28	1.47	2.28	1.63	1.14	1.79	1.96	0.81	0.81	0.98	1.47	0.98	0.00
51	410254	2.93	2.77	2.77	2.44	2.93	1.96	0.98	0.00	0.00	0.00	0.00	0.98	2.77	2.77	0.00
50	410253	2.90	2.74	1.93	2.51	1.74	1.74	1.35	1.93	2.90	0.00	0.00	2.26	2.32	2.51	0.00
49	410252	2.44	2.93	2.44	2.44	2.35	1.47	1.37	1.14	1.17	1.47	1.30	1.79	2.77	2.77	0.00
48	410251	2.97	2.64	2.47	2.80	2.47	1.32	1.32	1.48	0.99	1.38	2.47	2.47	2.14	1.98	0.00
47	410250	2.00	1.75	2.00	1.17	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
46	310258	1.14	0.00	1.96	1.96	2.93	1.96	0.00	1.96	1.96	1.96	1.63	1.96	0.98	0.98	0.98
45	310257	1.63	1.63	2.61	1.30	1.47	0.98	0.98	0.00	0.98	0.98	0.98	0.98	0.98	0.98	0.98
44	310256	1.96	1.96	1.96	1.96	2.12	1.96	0.00	0.00	0.00	0.00	2.93	0.00	0.98	0.98	0.98
43	310255	1.67	2.00	2.00	2.00	3.00	1.33	1.50	1.50	1.40	1.50	1.50	1.17	1.00	1.00	1.00
42	310254A	3.00	2.80	1.80	2.40	0.00	2.00	1.00	1.50	0.00	1.00	1.00	1.00	1.00	1.00	1.00
41	310253	1.33	2.17	2.17	1.33	2.00	1.00	1.00	3.00	1.00	2.00	0.00	0.00	1.00	1.00	1.00

Indirect PO Atainment

Sr. No	Survy	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
1	Student Exit	2.63	2.55	2.61	2.59	2.61	2.51	2.62	2.62	2.62	2.64	2.56	2.58	2.55	2.61	2.62
2	Alumni	0.00	0.00	0.00	2.81	2.81	2.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.72	2.76
3	Placement	2.78	2.04	2.04	2.04	0.00	2.46	0.00	0.00	0.00	0.00	3.00	3.00	2.04	2.04	2.04
4	Parent	2.61	0.00	0.00	0.00	0.00	2.51	0.00	0.00	0.00	0.00	2.58	2.55	2.51	2.58	2.55
5	Teacher	2.81	2.76	0.00	2.76	2.54	2.74	0.00	0.00	2.74	0.00	2.78	2.84	2.81	2.76	2.84
IPOA	Average	2.71	2.45	2.33	2.55	2.65	2.61	2.62	2.62	2.68	2.64	2.73	2.74	2.48	2.54	2.56

Direct PO Atainment	2.14	2.04	2.09	1.84	1.95	1.57	1.43	1.49	1.64	1.42	1.43	1.50	1.38	1.31	1.07
Indirect PO Atainment	2.71	2.45	2.33	2.55	2.65	2.61	2.62	2.62	2.68	2.64	2.73	2.74	2.48	2.54	2.56
A. 80% of Direct PO	1.71	1.64	1.67	1.47	1.56	1.26	1.14	1.19	1.31	1.14	1.15	1.20	1.10	1.05	0.85
B.20% of In Direct PO	0.54	0.49	0.47	0.51	0.53	0.52	0.52	0.52	0.54	0.53	0.55	0.55	0.50	0.51	0.51
PO Atainment (A+B)	2.25	2.13	2.14	1.98	2.09	1.78	1.67	1.72	1.85	1.66	1.69	1.74	1.60	1.56	1.37

Target PO	2.18	2.09	2.14	1.89	2.00	1.61	1.47	1.53	1.68	1.46	1.47	1.53	1.41	1.34	1.10
Achieved PO	2.25	2.13	2.14	1.98	2.09	1.78	1.67	1.72	1.85	1.66	1.69	1.74	1.60	1.56	1.37
Action Reuired	N	N	Y	N	N	N	N	N	N	N	N	N	N	N	N

esne

Course Co-ordinator

865-

Program Co-ordinator

Principal / Director



SINHGAD TECHNICAL EDUCATION SOCIETY'S NBN SINHGAD TECHNICAL INSTITUES CAMPUS NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41 DEPARTMENT OF COMPUTER ENGINEERING

POS & PSOS Attainment Levels and	Actions for improvement
Academic Year: 2	2021 - 22

POs	Target Level	Attainment Level	Observations						
PO1:	Engineering knowledge: Apply knowledge of mathematics, science and engineering to analyze,								
	design and evaluation	ate mechanical co	mponents & systems using state -of-the-art IT tools.						
PO1	2.24	2.29	Target Achieved						
Action									

POs	Target Level	Attainment Level	Observations						
PO2:	Problem analysis: Analyze problems of mechanical engineering including thermal, manufacturing and industrial systems to formulate design requirements								
	industrial system	s to formulate des	sign requirements						
PO2	2.15	2.17	Target Achieved						
Action									

POs	Target Level	Attainment Level	Observations							
PO3:	Design/developm	Design/development of solutions: Design, implement, and evaluate mechanical systems and processes								
		considering public health, safety, cultural, societal and environmental issues.								
PO3	2.14	2.15	Target Achieved							
Action										

POs	Target Level	Attainment Level	Observations
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SINHGAD TECHNICAL EDUCATION SOCIETY'S NBN SINHGAD TECHNICAL INSTITUES CAMPUS NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41 DEPARTMENT OF COMPUTER ENGINEERING

POs & PSOs Attainment Levels and Actions for improvement Academic Year: 2021 - 22

PO4:			ex problems: Use research-based knowledge and researchmethods
			nalysis and interpretation of data, and synthesis of theInformation to
	provide valid cor	nclusions.	
			Target Achieved
PO4	1.93	2.01	
Action			
Action			
		A 44	
POs	Target Level	Attainment	Observations
		Level	
PO5 :	Modern tool usa	age: Create, select	t, and apply appropriate techniques, resources, and
	modernengineeri	ng and IT tools in	icluding prediction and modeling to complex engineering activities
		nding of the limita	
			Target Achieved
PO5	2.00	2.08	
103	2.00	2.00	
Action			
	T	ı	
		Attainment	
POs	Target Level	Level	Observations
		Level	
PO6:	The engineer an	d society: Apply	reasoning informed by the contextual knowledge to assesssocietal,
			sues and the consequent responsibilities relevant to the Professional
	engineering pract	tice.	
			Target Achieved
PO6	1.60	1.77	
100	2,00	10.7	
Action			
Action			
		A44 •	
POs	Target Level	Attainment	Observations
		Level	



SINHGAD TECHNICAL EDUCATION SOCIETY'S NBN SINHGAD TECHNICAL INSTITUES CAMPUS NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41 DEPARTMENT OF COMPUTER ENGINEERING

POs & PSOs Attainment Levels and Actions for improvement

Academic Year: 2021 - 22

PO7:			: Understand the impact of the professional engineering solutions in ats, and demonstrate the knowledge of, and need for sustainable
	development.	Tommentar contex	its, and demonstrate the knowledge of, and need for sustamable
	1		Target Achieved
PO7	1.49	1.68	
Action		.1	
	1		
		T	1
POs	Target Level	Attainment Level	Observations
PO8:	Ethics: Apply et engineering pract		nd commit to professional ethics and responsibilities and norms of the
			Target Achieved
PO8	1.59	1.76	
Action	1	.1	
	1	T	T
POs	Target Level	Attainment Level	Observations
PO9:	Individual and	team work: Fund	ction effectively as an individual, and as a member or leader in diverse
	teams, and in mu	ıltidisciplinary set	
			Target Achieved
PO9	1.63	1.80	
Action	1	<u> </u>	
POs	Target Level	Attainment	Observations

Level



PSOs

Target Level

Level

SINHGAD TECHNICAL EDUCATION SOCIETY'S NBN SINHGAD TECHNICAL INSTITUES CAMPUS NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41 DEPARTMENT OF COMPUTER ENGINEERING

POs & PSOs Attainment Levels and Actions for improvement Academic Year: 2021 - 22

PO10:			effectively on complex engineering activities with the engineering
	The state of the s	•	ge, such as, being able to comprehend and write effective reports and
	design document	ation, make effec	tive presentations, and give and receive clear instructions.
			Target Achieved
PO10	1.50	1.69	
Action			
		Attainment	
POs	Target Level	Level	Observations
		Level	
PO11:			e: Demonstrate knowledge and understanding of the engineering and
			these to one's own work, as a member and leader in a team, to
	manage projects	and in multidiscip	plinary environments.
			Target Achieved
PO11	1.49	1.70	
Action		l.	
	•		
POs	Target Level	Attainment	Observations
		Level	
PO12:	Life-long learni	ng: Recognize th	he need for, and have the preparation and ability to engage in
	independent and	life-long learning	in the broadest context of technological change.
			Target Achieved
PO12	1.58	1.78	
1012	1.50	1.70	
Action			<u> </u>
,			
	I		
	I	Attainment	

PSO1: Graduate will apply their knowledge in the domain of mechanical and multi-disciplinary engineering

fields to solve real life problems in industries utilizing advanced technology

Observations



SINHGAD TECHNICAL EDUCATION SOCIETY'S NBN SINHGAD TECHNICAL INSTITUES CAMPUS NBN SINHGAD SCHOOL OF ENGINEERING, AMBEGOAN (BK), PUNE - 41

DEPARTMENT OF COMPUTER ENGINEERING

POs & PSOs Attainment Levels and Actions for improvement Academic Year: 2021 - 22

PSO1	1.47	1.64	Target Achieved
Action			

PSOs	Target Level	Attainment Level	Observations					
PSO2:	PSO2: Graduate will implement their technical skills to solve social and environmental issues.							
PSO2	1.39	1.59	Target Achieved					
Action								

PSOs	Target Level	Attainment Level	Observations
PSO3:	Graduate will apply their knowledge and leadership qualities to identify entrepreneurial opportunities		
PSO3	1.11	1.38	Target Achieved
Action			

Course Co-ordinator

Program Co-ordinator

Principal / Director