VSIT
Vidyalankar School of Information Technology

Version 05/22-8

Consolidated Academic Administration Plan for the Course

USIT 501, Software Project Management – Sem. V
B.Sc. (Information Technology)– 2022-2023 – Odd Semester
Ms. Pushpa Mahapatro, Ms. Ujwala Sav

The academic resources available in VSIT –

VMIS (ERP)	V-Refer and V-Live	VSIT Library	VAC & MOOC Courses
Institute & Department Vision and Mission	Former IA question papers and solutions (prepared by faculty)	Former IA question papers solutions - hardcopy	Value Added Courses (VAC) are conducted throughout the semester & in the semester break - Enrol for the VACs
Program Educational Objectives (PEO)	MU end semester examination question papers and solutions (prepared by faculty)	MU end semester exam question paper & solutions - by faculty, hardcopy	
Program Specific Outcome (PSO)	Class notes and Digital Content for the subject (scanned / typed by faculty)	All text books, reference books, e -books mentioned in the syllabus & AAP	Online courses from NPTEL, Coursera etc. are pursued throughout the semester - Register for the course & get certified
Program Outcome (PO)	Comprehensive question bank, EQ, GQ, PPT, Class Test papers	Technical journals and magazines for reference	
Departmental Knowledge Map	Academic Administration Plan & Beyond Syllabus Activity report	VSIT library is member of IIT Bombay Library	Watch former lectures captured in LMS at VSIT

1.a Course Objectives (Write in detail – as per NBA guidelines)

Cognitive	What do you want students to know?	Students will be able to demonstrate the principles of modern software project management. Students will be able to describe the model-based software architectures and its implementations.
Affective	What do you want students to think / care about?	Students will be able to analyse how the steps learnt can be implemented for various software projects. Students will be able to analyze and improve software economics.
Behavioural	What do you want students to be able to do?	Students will be able to create the design, track the software projects using various Activity Diagram Tools. Students will be able to analyze to reduce rework, labour-intensiveness, expenditure and produce a project within schedule.

Advice to Students:

Attend every class!!! Missing even one class can have a substantial effect on your ability to understand the course. Be prepared to think and concentrate, in the class and outside. I will try to make the class very interactive. Participate in the class discussions. Ask questions when you don't understand something. Keep up with the class readings. Start assignments and homework early. Meet me in office hour to discuss ideas, solutions or to check if what you understand is correct.

v-Refer Link for this course is given below-

http://live.vsit.edu.in/vrefer

Collaboration Policy:

We encourage discussion between students regarding the course material. However, no discussion of any sort is allowed with anyone on the assignment and homework for the class. If you find solution to some problems

in a book or on the internet, you may use their idea for the solution; provided you acknowledge the source (name and page in the book or the website, if the idea is found on the internet). Even though you are allowed to use ideas from another source, you must write the solution in your own words. If you are unsure whether or not certain kinds of collaboration is possible, please ask the teacher.

1.b Course Outcome (CO) Statements and Module-Wise Mapping (follow NBA guideline)

CO No.	Statements	Related Module/s
CO1	To describe the project management life cycle. To know the various steps in Programme Management and Project Planning.	Unit 1
CO2	To measure the various techniques of Software Effort Estimation.	Unit 2
CO3	To do Project Planning and Risk assessment.	Unit 3
CO4	To analyse how Monitoring and Control can be implemented for various software projects.	Unit 4
CO5	To realize the importance of team work and team formation.	Unit 5

1.c Mapping of COs with POs (mark S: Strong, M: Moderate, W: Weak, Dash '–': not mapped)

(List of POs is available in V-refer)

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

1.d Mapping of COs with PSOs (mark S: Strong, M: Moderate, W: Weak, Dash '–':not mapped)

	PSO 1	PSO 2	PSO 3	PSO 4
CO 1				
CO 2				
CO 3				
CO 4				
CO 5				

1.e Teaching and Examination Scheme (As specified by the University) for the Course

Categories	Humanities and Social Sciences	Basic Science	Engineering Science	Professional Core	General Education	Professional Elective	Project/ Internship	Open Elective
Tick suitable category		✓						

Subject Code	Subject Name	Teaching Scheme			Credits Assigned			
		Theory	Practical	Tutorial	Theory	TW/Practical	Tutorial	Total
(For Theory Only)	USIT501	75	-	25	2	-	-	2
(For Lab Only)	-	-	-	-	-	-	-	-

Subject Code	Subject Name	Examination Scheme							
		Theory Marks IA Test			End Sem. Exam Marks	TW	Practical	Oral	Total
		IA 1	IA 2	Average of IA1 and IA2					
USIT501	SPM	20 (Scaled to 15)	-	-	75	10	-	-	100
-	-	-	-	-	-	-	-	-	-

1.f Faculty-Wise Distribution of all Lecture-Practical-Tutorial Hours for the Course

Divisions	Lecture (Hrs.)	Practical (Hrs.)				Tutorial (Hrs.)			
		Batch 1	Batch 2	Batch 3	Batch 4	Batch 1	Batch 2	Batch 3	Batch 4
Div A	4.00	NA	NA	NA	NA	N.A.	N.A.	N.A.	N.A.
Div B	4.00	NA	NA	NA	NA	N.A.	N.A.	N.A.	N.A.
Div C	4.00	NA	NA	NA	NA	N.A.	N.A.	N.A.	N.A.
Div D	4.00	NA	NA	NA	NA	N.A.	N.A.	N.A.	N.A.

1.g Office Hours (Faculty will be available in office in this duration for solving students' query)

Division	Day	Time (at least 1 Hr. / Division)	Venue (Office Room No.)
Div A	Monday	2:30 pm to 3:30 pm	Discussion Room
Div B	Monday	2:30 pm to 3:30 pm	Discussion Room
Div C	Monday	2:30 pm to 3:30 pm	Discussion Room
Div D	Monday	2:30 pm to 3:30 pm	Discussion Room

2.a Syllabus : Module Wise Teaching Hours and % Weightage in University Question Paper

Module No.	Module Title and Brief Details	Teaching Hrs. for each module	% Weightage in University Question Papers
1	Introduction to Software Project Management, Project Evaluation and Programme Management, An Overview of Project Planning	14 lectures x60min	20
2	Selection of an Appropriate Project Approach, Software Effort Estimation	10 lectures x60min	20
3	Activity Planning, Risk Management, Resource Allocation	10 lectures x60min	20
4	Monitoring and Control, Managing Contracts, Managing People in Software Environments	08 lectures x60min	20
5	Working in Teams, Software Quality, Project Closeout	08 lectures x60min	20
* Insert rows for more modules in the Course	**Total**	**50 lectures X 60 Minutes**	**100**

2.b Prerequisite Courses

No.	Semester	Name of the Course	Topic/s
1	IV	Software Engineering	SDLC Models, Cost Estimation using various models like COCOMO, Risk analysis and assessment,

2.c Relevance to Future Courses

No.	Semester	Name of the Course
1	VI	Software Quality Assurance for TY BScIT
2	V, VI	Project For TY B. Sc. IT
3	Part 2, Sem 3	Technical Writing and Entrepreneurship Development - Managing R&D Projects for MScIT
4	Part 2, Sem 3 and 4	Project for MSc IT

2.d Identify real life scenarios/examples which uses the knowledge of the subject (Discussion on how to prepare examples and case studies e.g. "Boeing Plane": C Programming Language – Intro to Computer Science – Harvard's CS50 (2018) – Bing video)

Real Life Scenario	Concept Used
Software projects in all domains	Software projects
Project management software that allows you to map out the entire life of a project - Zoho Projects	Project management
Collaborate across your whole organization - ClickUp	Collaboration

Project planning Tool - Asana	Project planning
The Best Project Management Software for 2020 - PCMag	Project management
functions of a project management software – Team book	Functions of SPM
Collaborating with team members – Wrike	Collaboration
Project schedule can deviate from the original plan midway to execution – Liquid Planner	Project planning
JIRA project management software	Work Management
Automatic vending of cane juices, Pad Disposal Machines	Proposal in Shark Tank
Role of Scrum Master	Scrum

3 Past Results – Division-Wise

Details	Target – Nov 2023	Nov 2022	Nov 2021	Nov 2020
Course Passing % – Average of 4 Divisions	90	71.75	100	100
Marks Obtained by Course Topper (mark/100)	95	91	100	100

	Div A		Div B		Div C		Div D		Div E		Div F	
Year	Initials of Teacher	% Result	Initials of Teacher	% Result	Initials of Teacher	% Result	Initials of Teacher	% Result	Initials of Teacher	% Result	Initials of Teacher	% Result
Nov 2022	PSM	73.4	UMS	70.42	PSM	100	UMS	72.73	PSM	70.18	-	-
Nov 2021	PSM	100	UMS	100	PSM	100	UMS	100	PSM	100	-	-
Nov 2020	PSM, UMS	100 (Div 1)	PSM, UMS	100 (Div 2)	PSM, UMS	100 (Div 3)	-	-	-	-	-	-

4 All the Learning Resources – Books and E-Resources

4.a List of Text Books (T – Symbol for Text Books) to be Referred by Students

Sr. No	Text Book Titles	Author/s	Publisher	Edition	Module Nos.
1	Project Management and Tools & Technologies An overview	Shailesh Mehta	SPD	1st	1, 2

4.b List of Reference Books (R – Symbol for Reference Books) to be Referred by Students

Sr. No	Reference Book Titles	Author/s	Publisher	Edition	Module Nos.
1	Software Project Management	Bob Hughes, Mike Cotterell, Rajib Mall	MGH	6th	1 to 5
2	Effective Software Project Management	Robert K Wysocki	Wiley India Edition	1st	3, 4, 5
3	Software Project Management	Walker Royce	Pearson Education	2005	1, 3, 4
4	Software Engineering	Roger Pressman	McGraw Hill	2009	1, 2
5	Software Project Management	Joel Henry	Pearson	1st, 2004	1, 2, 4
6	Software Engineering	Ian Sommerville	Pearson	8th	2,4,5
7	An Integrated Approach To Software Engineering	Pankaj Jalote	Narosa	2009	1, 2, 3
8	Object Oriented Modelling And Design	James Rambaugh	PHI	2009	For project
9	Object Oriented Systems Development using Unified Modelling Language	Ali Bahrami	McGraw Hill	2009	For project

4.c List of E - Books (E – Symbol for E-Books) to be Referred by Students

Sr. No	E- Book Titles	Author/s	Publisher	Edition	Module Nos.
1	Applied Software Project Management	Jennifer Greene, Andrew Stellman	OREILLY	1st	1, 2
2	IT Project Governance	Magnus Mahring	EFI at SSE2002	2002	ALL
3	Project Management Handbook	Wouter Baars	projectmanagement-training.net 2006	2006	ALL
4	A Project Management Primer	Nick Jenkins		2006	1, 2
5	Making Things Happen: The art of Project Management	Scott Berkun	OREILLY	1st	2, 3

4.d Reading latest / top rated research papers (at least 5 papers)

Name of Paper	Name of Authors (Background)	Published in		Problem Statement
		Date	Journal	
Software Project Management Using Machine Learning Technique—A Review https://www.mdpi.com/2076-3417/11/11/5183	Mohammed Najah Mahdi ,*ORCID,Mohd Hazli Mohamed Zabil, Abdul Rahim Ahmad ,Roslan Ismail ,Yunus Yusoff ,Lim Kok Cheng ,Muhammad Sufyian Bin Mohd Azmi ,Hayder Natiq ORCID andHushalini Happala Naidu	2 June 2021	Software Engineering: Computer Science and System	ANN, Fuzzy Logic, Genetic, and Regression Algorithms are the critical ML methods of automatic effort estimation. The precise calculation of effort is one of the leading software development practices. The software was specifically influenced by time and difficulty. Basic themes may be drawn from various ML works in software project management.
Formalization of the prediction and ranking of software development life cycle models https://www.sciencegate.app/keyword/176751	Laiali Almazaydeh Moath Alsafasfeh Reyad Alsalameen Shoroq Alsharari	2022	International Journal of Electrical and Computer Engineering (IJECE)	An applicable tool in predicting and ranking suitable SDLC models on various types of projects, such as: life-critical systems, commercial uses systems, and entertainment applications.
A Comprehensive Software Project Management Framework https://www.scirp.org/journal/paperinformation.aspx?paperid=98890	Mohamed Ellithey Barghoth, Akram Salah, Manal A. Ismail	March 17, 2020	Journal of Computer and Communications Vol.8 No.3,	This framework called 4PTRB which includes people, process, product, project, technology, risk, and business management areas. The 4PTRB software project management framework provides a whole comprehensive view to help software project managers to improve their project management effectiveness.
Software project management and planning: the case of the Greek IT sector https://www.researchgate.net/publication/228648757_Software_project_management_and_planning_the_case_of_the_Greek_IT_sector	Prodromos D Chatzoglou Democritus University of Thrace Nikolaos Theriou Efstathios Demitriades International Hellenic University	January 2007	International Journal of Applied Systemic Studies	To examine the production process adopted and the management practices used by Greek IT/IS sector

	Vassilios Aggelidis ΓΕΝΙΚΟ ΝΟΣΟΚΟΜΕΙΟ ΚΑΒΑΛΑΣ			
Identifying Key Characteristics of Business Rules That Affect Software Project Success https://www.sciencegate.app/keyword/176751	Damjan Vavpotič Diana Kalibatiene Olegas Vasilecas Tomaž Hovelja	2022	International Journal of Electrical and Computer Engineering (IJECE)	How BR affect software implementation success, namely, which key characteristics of BR are the most important. To achieve this goal, the top thousand enterprises in Slovenia, by added value, facing typical software implementation projects were surveyed.

4.e **Based on research paper an identify the current Problem statement**

Problem Statement			Used in				
	Quiz	Assignment	Lab	Mini Project	Poster Presentation	Test	Any Other
ANN, Fuzzy Logic, Genetic, and Regression Algorithms are the critical ML methods of automatic effort estimation. The precise calculation of effort is one of the leading software development practices. The software was specifically influenced by time and difficulty. Basic themes may be drawn from various ML works in software project management.		Yes					
An applicable tool in predicting and ranking suitable SDLC models on various types of projects, such as: life-critical systems, commercial uses systems, and entertainment applications.					Yes		
This framework called 4PTRB which includes people, process, product, project, technology, risk, and business management			Yes				

areas. The 4PTRB software project management framework provides a whole comprehensive view to help software project managers to improve their project management effectiveness.							
This research attempts to examine the production process adopted and the management practices used by Greek IT/IS sector	Yes						
How BR affect software implementation success, namely, which key characteristics of BR are the most important. To achieve this goal, the top thousand enterprises in Slovenia, by added value, facing typical software implementation projects were surveyed.				Yes			

4.f Identify Companies / Industries which use the knowledge of the subject and thus may provide Internships and final Placements

Name of the Company	To be / Contacted for		
	Student Internship	Student Final Placement	Faculty Internship
Accenture	-	Yes	-
Capgemini	Yes	-	-

4.g Identify suitable relevant TOP Guest Speakers from Industry

(CS50 Lecture by Mark Zuckerberg - 7 December 2005 - YouTube)

Name of the Identified Guest Speaker	Designation	Name of the Company
Rajbahadur Yadav, LinkedIn Profile: https://www.linkedin.com/in/rajbahadur-yadav-0a7b9115/	Project Manager	Ecart Express Pvt. Ltd.

4.h Identify relevant Technical competitions to participate [Competitions -Paper Presentations, Projects, Hackathons, IVs etc..]

Name of the Relevant Technical Competition Identified to participate	Organized by	Date of the Event
Gleam (gleam.io) is a contest management application from the Australian company of the same name.	Ameer Hamza	12th August, 2023
ROBO CONTEST, PAPER PRESENTATION, PROJECT DESIGN, DRONE VOYAGE, CYBER WAR, GO KARTING, MEGA LEAGUE HACKATHON https://www.knowafest.com/explore/events/2023/04/2701-tech-nimble-2023-nadimpalli-satyanarayana-raju-institute-technology-techno-fun-festival-visakhapatnam	Nadimpalli Satyanarayana Raju Institute of Technology, Techno Fun Festival, Visakhapatnam, Andhra Pradesh	10th August 2023

4.i Identify faculty in TOP schools / Universities who are teaching same / similar subject and develop rapport e.g. Exchange Lecture Material (Assignments / Tests / Project etc..), Joint Paper Publication

University	Name of the Course	Name of Faculty	Type of Collaboration		
			Exchange of Lecture Material	Joint Publication/ Research	Other
Simplilearn	PMP® Certification Training Course	-	-	-	Simplilearn
IIT Kanpur	Project Management	Prof. Raghu Nandan Sengupta	-	-	NPTEL Course

4.j Module Best Available in - Title best resource [from *4.a* to *4.d* in this AAP] & give details

Module No.	Title of the Module	Web Link	Mention the Tile			
			Journal	E-Journal	Magazine	Other Resource
1	Introduction to Software Project Management, Project Evaluation and Programme Management, An	https://journals.sagepub.com/home/pmx	Yes	Yes	-	-

	Overview of Project Planning					
2	Selection of an Appropriate Project Approach, Software Effort Estimation	https://www.pmtoday.co.uk/			Yes	
3	Activity Planning, Risk Management, Resource Allocation	Project Management Magazine (monthly) | pmmagazine.net pmmagazine.net https://pmmagazine.net				
4	Monitoring and Control, Managing Contracts, Managing People in Software Environments	https://www.researchgate.net/publication/274217803_PROJECT_CONTRACT_MANAGEMENT	Yes			
5	Working in Teams, Software Quality, Project Closeout	https://journals.sagepub.com/doi/full/10.1177/8756972820953958	Yes			

4.k **Referred to any top-rated university in that subject for content**

University	Name of the Course	Name of Faculty	Date of Delivery of the Course	Remarks
Project Management Institute	Project Management Professional (PMP)	PMP Faculty	Online registration	Paid course with certificate

4.l **Faculty received any certification related to this subject. List of Certifications Identified / Done**

Course	Certifying Agency	No. of Hours	Level of the Course		Certification		Remarks
			Introductory	Advance Skill Development	Done on	Proposed to be on	

Latex	Spoken Tutorials	4 week	Yes	-	Oct 2022	-	Certified

4.m **Completed subject wise/cluster wise training with cluster mentor.**
List of relevant Refresher Course Identified / Done

Course	Certifying Agency (As suggested by DAB/Cluster Mentor/Industry/ University other than MU)	Certification		Remarks
		Done on	Proposed to be on	
Pedagogy	MHRD Orientation Programme	10th Dec 2020	-	Certified
PBL				
Sub. Content Training				

4.n **Best Practices Identified and adopted**

No.	Item	Best Practices Identified		
		Henry Harvin Education https://www.henryharvin.com/ppc3/pmp-certification-training?utm_source=google&utm_medium=cpc&utm_campaign=pmp_search&gclid=Cj0KCQjw4s-kBhDqARIsAN-ipH2rJPiekd_AApeKPKfB7liB2kGvfRhs128TUVPFY9F7N3IeO9SloTsaAkj-EALw_wcB	IIM Indore Course https://projectmanagementcourse.in/iim-indore-certificate-programme-in-project-management/?utm_source=google&utm_medium=IIMI-CPPM07-Generic-Keyword-P-00327&utm_campaign=cppmsearch07&utm_term=keyword&gclid=Cj0KCQjw4s-kBhDqARIsAN-ipH2Q6XyYzAYeLwzUqgKi5jJnysggisbUEsrR_3GK9-hND0iHg4QysKUaAvA-EALw_wcB	Simplilearn https://www.simplilearn.com/project-management
1	Microsite	-	-	-
2	Video Lectures	Yes	Yes	Yes
3	Assignments	Yes	Yes	Yes
4	Mini Project	Yes	Yes	Yes
5	Assessment Metric	-	Yes	Yes
6	Quizzes	Yes	Yes	Yes
7	Labs/ Practical (PBL)	Yes	Yes	Yes
8	Tests	Yes	Yes	Yes
9	Peer Assessment	-	-	Yes
10	Any Other	-	-	-

4.o Web Links for Online Notes/YouTube/VSIT Digital Content/VSIT Lecture Capture/NPTEL Videos

Students can view lectures by VSIT professors, captured through LMS 'Lecture Capture' in VSIT campus for previous years.

No.	Websites / Links	Module Nos.
1	Video on 'A course in software project management – part #1 - YouTube https://www.youtube.com/watch?v=M-ROc1JKlRU	1
2	Project Evaluation https://www.youtube.com/watch?v=TTUjPZIh2Ak	2
3	Video on 'Iterative and Incremental Model' https://www.youtube.com/watch?v=9sGTrWjFpvI	2, 3
4	Software Cost Estimation https://www.youtube.com/watch?v=g2ciEJeE5N0	3
5	Managing Contract https://www.youtube.com/watch?v=QIVkI7SwvzE	4
6	Managing People in Software Management https://www.youtube.com/watch?v=5BbFM4nqvxI	4
7	Working in Team 3 https://www.youtube.com/watch?v=kYjqtLCNqSA	5

4.p Recommended MOOC Courses like Coursera / NPTEL / MIT-OCW / edX/VAC etc.

Sr. No.	MOOC Course Link	Course conducted by – Person / University / Institute / Industry	Course Duration	Certificate (Y / N)
1	Project Management By Prof. Raghu Nandan Sengupta | IIT Kanpur, https://onlinecourses.nptel.ac.in/noc21_mg71/preview	NPTEL	8 weeks	Y
2	Latex	Spoken Tutorials	14 videos	Y
3	Introduction to Project Management https://www.udemy.com/project-management/	Udemy	3 hrs	Y
4	Introduction to Project Management	edX in co-ordination with The University of Adelaide	6 weeks (self paced)	Certificate Chargeable
5	Project Management: The Closing Phase https://www.udemy.com/project-management-improve-project-manager-skills/	Udemy	0.5 hrs	Y
6	JIRA project management software, https://www.atlassian.com/software/jira/guides/getting-started/basics	JIRA	10 hrs	N

5 Consolidated Course Lesson Plan

	From (date/month/year)	From (date/month/year)	Total Number of Weeks
Semester Duration	12-06-2023	Oct 2023	15

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
1	1	1	**Introduction to Software Project Management**: Introduction, Why is Software Project Management Important? What is a Project?		1	1	1/1/1
1	2		Software Projects versus Other Types of Project, Contract Management and Technical Project Management, Activities Covered by Software		1	2	1/1/1
1	3		Project Management, Plans, Methods and Methodologies, Some Ways of Categorizing Software Projects, Project Charter, Stakeholders,		1	3	1/4/1
1	4		Setting Objectives, The Business Case, Project Success and Failure, What is Management? Management Control, Project Management Life Cycle,		1	4	1/7/1
1		SS	Traditional versus Modern Project Management Practices.		1		1/9/1
2	5		**Project Evaluation and Programme Management:** Introduction, Business Case, Project Portfolio Management,		1	5	2/31/1
2	6		Evaluation of Individual Projects, Cost benefit Evaluation Techniques, Risk Evaluation, Programme Management,		1	6	2/35/1
2	7		Managing the Allocation of Resources within Programmes, Strategic Programme Management, Creating a Programme,		1	7	1/23/1
2	8		Aids to Programme Management, Some Reservations about Programme Management, Benefits Management.		1	8	2/47/1
3	9		**An Overview of Project Planning:** Introduction to Step Wise Project Planning, Step 0: Select Project,		1	9	3/68/1
3	10		Step 1: Identify Project Scope and Objectives, Step 2: Identify Project Infrastructure, Step 3: Analyse Project Characteristics,		1	10	3/75/1
3	11		Step 4: Identify Project Products and Activities, Step 5: Estimate Effort for Each Activity, Step 6: Identify Activity Risks,		1	11	3/77/1

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
3	12		Step 7: Allocate Resources, Step 8: Review/Publicize Plan, Steps 9 and 10: Execute Plan/Lower Levels of Planning		1	12	3/79/1
4	13		**Viva/ Students' Activity on Unit I**		1	13	1, 2, 3
4	14		**Viva/ Students' Activity on Unit I**		1	14	1, 2, 3
4	15	2	**Selection of an Appropriate Project Approach:** Introduction, Build or Buy? Choosing Methodologies and Technologies,		2	15	4/81/1
4		SS	Software Processes and Process Models, Choice of Process Models, Structure versus Speed of Delivery,		2		4/88/1
4		SS	The Waterfall Model, The Spiral Model, Software Prototyping, Other Ways of Categorizing Prototypes, Incremental Delivery,		2		4/88/1
4	16		Atern/Dynamic Systems Development Method, Rapid Application Development, Agile Methods, Extreme Programming (XP), Scrum,		2	16	4/98/1
5	17		Lean Software Development, Managing Iterative Processes, Selecting the Most Appropriate Process Model.		2	17	4/108/1
5	18		**Software Effort Estimation:** Introduction, Where are the Estimates Done?		2	18	5/117/1
5		SS	Problems with Over- and Under-Estimates, The Basis for Software Estimating,		2		5/117/1
5	19		Software Effort Estimation Techniques, Bottomup Estimating, The Top-down Approach and Parametric Models,		2	19	5/120/1
5	20		Expert Judgement, Estimating by Analogy, Albrecht Function Point, Analysis, Function Points Mark II,		2	20	5/128/1
6	21		COSMIC Full Function Points, COCOMO II: A Parametric Productivity Model, Cost Estimation,		2	21	5/133/1
6	22		Staffing Pattern, Effect of Schedule Compression, Capers Jones Estimating Rules of Thumb		2	22	5/135/1
6	23		**Viva/ Students' Activity on Unit II, Pop Quiz**		2	23	
6	24		**Viva/ Students' Activity on Unit II, Pop Quiz**		2	24	
7	25	3	**Activity Planning:** Introduction, Objectives of Activity Planning, When to Plan,		3	25	6/155/1

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
7	26		Project Schedules, Projects and Activities, Sequencing and Scheduling Activities, Network Planning Models,		3	26	6/157/1
7	27		Formulating a Network Model, Adding the Time Dimension, The Forward Pass, Backward Pass, Identifying the Critical Path, Activity Float,		3	27	6/164/1
7	28		Shortening the Project Duration, Identifying Critical Activities, Activity-on-Arrow Networks.		3	28	6/174/1
8	29		**Risk Management:** Introduction, Risk, Categories of Risk, Risk Management Approaches,		3	29	7/188/1
8		SS	A Framework for Dealing with Risk, Risk Identification, Risk Assessment, Risk Planning, Risk Management, Measures,		3		7/192/1
8	30		Applying the PERT Technique, Monte Carlo Simulation, Critical Chain Concepts.		3	30	7/203/1
8	31		**Resource Allocation:** Introduction, Nature of Resources, Identifying Resource Requirements,		3	31	8/219/1
8	32		Scheduling Resources, Creating Critical Paths, Counting the Cost, Being Specific,		3	32	8/224/1
8		SS	Publishing the Resource Schedule, Cost Schedules, Scheduling Sequence.		3		8/230/1
9	33		**Viva/ Students' Activity on Unit III, PBL**		3	33	
9	34		**Viva/ Students' Activity on Unit III, PBL**		3	34	
9	35	4	**Monitoring and Control:** Introduction, Creating the Framework, Collecting the Data,		4	35	9/238/1
9	36		Review, Visualizing Progress, Cost Monitoring, Earned Value Analysis, Prioritizing Monitoring,		4	36	9/244/1
9		SS	Getting the Project Back to Target, Change Control, Software Configuration Management (SCM).		4		9/257/1
10	37		**Managing Contracts:** Introduction, Types of Contract, Stages in Contract Placement,		4	37	10/270/1
10	38		Typical Terms of a Contract, Contract Management, Acceptance.		4	38	10/280/1
10	39		**Managing People in Software Environments:** Introduction, Understanding Behaviour,		4	39	11/286/1

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
			Organizational Behaviour: A Background,				
10	40		Selecting the Right Person for the Job, Instruction in the Best Methods, Motivation, The Oldham Hackman Job Characteristics Model,		4	40	11/290/1
10		SS	Stress, Stress Management, Health and Safety, Some Ethical and Professional Concerns.		4		11/296/1
11	41		**Viva/ Students' Activity on Unit IV,OBT**		4	41	
11	42		**Viva/ Students' Activity on Unit IV, OBT**		4	42	
11	43	5	**Working in Teams:** Introduction, Becoming a Team, Decision Making,		5	43	12/303/1
11	44		Organization and Team Structures, Coordination Dependencies, Dispersed and Virtual Teams, Communication Genres,		5	44	12/312/1
11		SS	Communication Plans, Leadership.		5		12/323/1
12	45		**Software Quality :** Introduction, The Place of Software Quality in Project Planning, Importance of Software Quality,		5	45	13/327/1
12	46		Defining Software Quality, Software Quality Models, ISO 9126, Product and Process Metrics,		5	46	13/329/1
12	47		Product versus Process Quality Management, Quality Management Systems, Process Capability Models,		5	47	13/339/1
12		SS	Techniques to Help Enhance Software Quality, Testing, Software Reliability, Quality Plans.		5		14/374/1
12	48		**Project Closeout:** Introduction, Reasons for Project Closure, Project Closure Process, Performing a Financial Closure, Project Closeout Report.		5	48	14/374/1
13	49		**Viva/ Students' Activity on Unit V, MOOCs**		5	49	
13	50		**Viva/ Students' Activity on Unit V, MOOCs**		5	50	

6 Rubric for Grading and Marking of Term Work (inform students at the beginning of semester)

Lecture + Practical (% of class participation) & Marks	Assign-ments	Tutorial	Lab / Practical Performance	Lab Journal Assessment	Class Tests (Other than IA)	Other (1) specify	Other (2) specify	Total
75% Attendance, Active Participation – 10 Marks		-	-	-	IA 1 - 20 Marks, Scaled to 15 Marks	-	-	100

7 Assignments / Tutorials Details

Assignment/ Tutorial No.	Title of the Assignments / Tutorials	CO Map	Assignment/ Tutorials given to Students on	Week of Submission
1	Introduction to Software Project Management, Project Evaluation and Programme Management, An Overview of Project Planning	1	4th Week	4th Week
2	Activity Planning, Risk Management, Resource Allocation, PBL	3	8th Week	8th Week

Analysis of Assignment / Tutorial Questions and Related Resources

Assignment / Tutorial No.	Week No.	Type* (√)			Module No.	Based on #			Question Type (√)	
		R	PQ	OBT		Text Book	Reference Book	Other Learning Resource	MU EQ	Thought Provoking
1	4	√	-	-	1	1	1	-	4	4
3	8	-	-	-	3	1	1	-	-	4

* Tick (√) the Type of the Assignment: Regular (R); Pop Quiz (PQ) ; Open Book Test for TE/BE/ME (OBT)
# Write number for text book, reference book, other learning resource from this AAP – *from Points 4.a to 4.d*

8 Internal Assessment / Other Class Test / Open Book Test (OBT)/Take Home Test (THT) Details

Tests	Test Dates	Module No.	CO Map	IA Question Paper Pattern	Policy
1st IA Test	9th week	1, 2, 3	1, 2, 3	Q1 – 05 Marks Q2 – 05 Marks Q3 – 05 Marks	No IA Re-test IA is a Head of passing *
2nd IA Test	-	-	-		

Pop Quiz	5th Week	2	2	MS Teams	-
Open Book Test	-	-	-	-	-
Take Home Test	-	-	-	-	-
Class tests / prelims	-	-	-	-	-
Class tests / prelims					
Any other test/exams					

*** Failures of IA test (IA1+IA2) shall appear for IA test in the next semester. There is no provision for re-test in the same semester.**

9.a Practical Activities

Practical No.	Module No.	Title of the **Experiments**	Type of Experiment		Topics to be highlighted	CO Map
			PBL	Newly Added		
		NA				

10 Beyond Syllabus Activities for Gap Mitigation

No.	Type of the Activity	Activities	Number of beneficiaries	Other Details – guest profile, feedback, mark sheet, report

1	**Experiential learning/Interaction with Outside World**	1- Guest Lectures by Industry Expert	Yes - 120	Rajbahadur Yadav, LinkedIn Profile: https://www.linkedin.com/in/rajbahadur-yadav-0a7b9115/
		2- Workshops	-	-
		3- Mini Project	-	-
		4- Industrial Visit		Visit to VJTI startups
		5- Any other activity		
2	**Collaborative & Group Activity**	6- Poster Presentation		-
		7- Minute Papers	Yes - 300	-
		8- Students Seminars		-
		9- Students Debates		-
		10- Panel Discussion / Mock GD		-
		11- Mock Interview		-
		12- Any other activity		-
3	**Co-Curricular Activity**	13- Informative videos (NPTEL/Youtube /TEDx/ MIT OW/edX)	MOOC - 300	Latex
		14- Lecture Capture Usage	Yes	Yes
		15- Any other activity	-	-
4	**Tests & Assessments**	16- Class Tests/ Weekly Tests	-	Yes
		17- Pop Quiz	Yes	MS Teams

		18- Mobile App Based Quiz	-	-
		19- Open Book Test	-	-
		20- Take Home Test	-	-
		21- Any other activity	-	-

11.1 One-on-One Academic Mentoring Meetings done

No.	Name of Mentee	Date of One-On-One Meeting		
		Beginning of Sem.	After Mid Term Results	Before End Sem.
1				

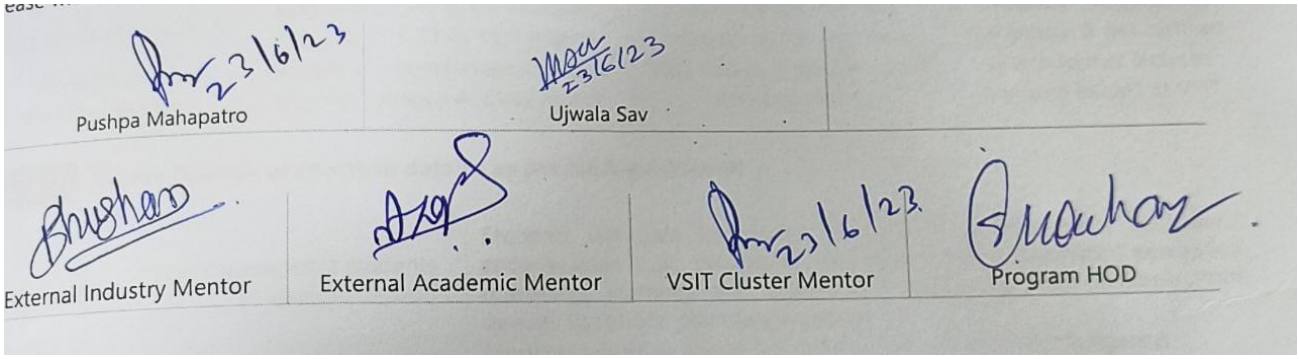
11.2 Identify concerns and refer appropriately

No.	Name of Mentee	Action Taken		
		Individual Goals Identified	Any Financial Concern which needs to be referred to	Any Emotional Concern to be referred to
1				

*** Do not delete any activity. Give details for planned events. Write 'NA' for activity Not Planned.**

Consolidated Academic Administration Plan Prepared by (mention all theory teaching faculty names with signature)

Please write below your name and sign with date of the external cluster mentor meeting



VSIT
Vidyalankar School of Information Technology

Version 05/23-6

Consolidated Academic Administration Plan for the Course

Advanced Web Programming

Sem. V – Program B.Sc. IT 2023-24 – Odd Semester

Faculty – Ms. Seema M., Dr. Pallavi Tawde

The academic resources available in VSIT –

VMIS (ERP)	V-Refer and V-Live	VSIT Library	VAC & MOOC Courses
Institute & Department Vision and Mission	Former IA question papers and solutions (prepared by faculty)	Former IA question papers solutions - hardcopy	Value Added Courses (VAC) are conducted throughout the semester & in the semester break - Enrol for the VACs
Program Educational Objectives (PEO)	MU end semester examination question papers and solutions (prepared by faculty)	MU end semester exam question paper & solutions - by faculty, hardcopy	
Program Specific Outcome (PSO)	Class notes and Digital Content for the subject (scanned / typed by faculty)	All text books, reference books, e -books mentioned in the syllabus & AAP	Online courses from NPTEL, Coursera etc. are pursued throughout the semester - Register for the course & get certified
Program Outcome (PO)	Comprehensive question bank, EQ, GQ, PPT, Class Test papers	Technical journals and magazines for reference	
Departmental Knowledge Map	Academic Administration Plan & Beyond Syllabus Activity report	VSIT library is member of IIT Bombay Library	Watch former lectures captured in LMS at VSIT

1.a Course Objectives (Write in detail – as per NBA guidelines)

Cognitive	What do you want students to know?	To know C# language basics & .NET framework fundamentals & develop web applications using ASP.NET.
Affective	What do you want students to think / care about?	To understand webform fundamentals & development of ASP.NET applications using styles, themes, ADO.NET XML & AJAX.
Behavioural	What do you want students to be able to do?	To develop data driven web applications.

Advice to Students:

Attend every class!!! Missing even one class can have a substantial effect on your ability to understand the course. Be prepared to think and concentrate, in the class and outside. I will try to make the class very interactive. Participate in the class discussions. Ask questions when you don't understand something. Keep up with the class readings. Start assignments and homework early. Meet me in office hour to discuss ideas, solutions or to check if what you understand is correct.

Collaboration Policy:

We encourage discussion between students regarding the course material. However, no discussion of any sort is allowed with anyone on the assignment and homework for the class. If you find solution to some problems in a book or on the internet, you may use their idea for the solution; provided you acknowledge the source (name and page in the book or the website, if the idea is found on the internet). Even though you are allowed to use ideas from another source, you must write the solution in your own words. If you are unsure whether or not certain kinds of collaboration is possible, please ask the teacher.

1.b Course Outcome (CO) Statements and Module-Wise Mapping (follow NBA guideline)

CO No.	Statements	Related Module/s
CO1	To create console applications using the basic concepts, expressions, various conditional statements, and loops of C#.	Unit 1
CO2	To use and implement ASP.NET Form Fundamentals to design webforms.	Unit 2
CO3	To learn and implement the concepts of exception handling & State management.	Unit 3
CO4	To implement database drivers, and design web applications using ADO.NET.	Unit 4
CO5	To develop web applications using XML & AJAX.	Unit 5

1.c Mapping of COs with POs (mark S: Strong, M: Moderate, W: Weak, Dash '–': not mapped)

(List of POs is available in V-refer)

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO 1	S	M	S	M	S							
CO 2	S	M	S	M	S							
CO 3	M	S	S	S	M							
CO 4	S	W	S	W	S							
CO 5	S	M	M	M	M							

1.d Mapping of COs with PSOs (mark S: Strong, M: Moderate, W: Weak, Dash '–':not mapped)

	PSO 1	PSO 2	PSO 3	PSO 4
CO 1	S	S	M	
CO 2	S	M	M	
CO 3	M	W	W	
CO 4	S	M	W	
CO 5	M	S	M	

1.e Teaching and Examination Scheme (As specified by the University) for the Course

Categories	Humanities and Social Sciences	Basic Science	Engineering Science	Professional Core	General Education	Professional Elective	Project/ Internship	Open Elective
Tick suitable category				✓				

Subject Code	Subject Name	Teaching Scheme			Credits Assigned			
		Theory	Practical	Tutorial	Theory	TW/Practical	Tutorial	Total
USIT503	Advanced Web Programming	75	50	-	2	2	-	4

Subject Code	Subject Name	Examination Scheme							
		Theory Marks IA Test			End Sem. Exam Marks	TW	Practical	Oral	Total
		IA 1	IA 2	Average of IA1 and IA2					
USIT503	Advanced Web Programming	30 (Scaled down to 7.5)	-	15 +10(active participation)	75	25	50	-	150

1.f Faculty-Wise Distribution of all Lecture-Practical-Tutorial Hours for the Course

Divisions	Lecture (Hrs.)	Practical (Hrs.)				Tutorial (Hrs.)			
		Batch 1	Batch 2	Batch 3	Batch 4	Batch 1	Batch 2	Batch 3	Batch 4
Div A	4	2	2	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Div B	4	2	2	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Div C	4	2	2	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Div D	4	2	2	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

1.g Office Hours (Faculty will be available in office in this duration for solving students' query)

Division	Day	Time (at least 1 Hr. / Division)	Venue (Office Room No.)
Div A,B,C,D	Monday	2:30 p.m – 3:30 p.m	X-011

2.a Syllabus : Module Wise Teaching Hours and % Weightage in University Question Paper

Module No.	Module Title and Brief Details	Teaching Hrs. for each module	% Weightage in University Question Papers
1	Introducing .NET, C# Languages, Types, Objects & Name spaces	10	20
2	Webform Fundamentals & various Webform Controls	12	20
3	Error handling, Logging & tracing state management, Style themes & Master pages	8	20
4	ADO.NET Fundamentals, Data Binding	10	20
5	XML, Security Fundamentals, ASP.NET AJAX	10	20
* Insert rows for more modules in the Course	**Total**	**50**	**100**

2.b Prerequisite Courses

No.	Semester	Name of the Course	Topic/s
1	II	Web Programming	Web Server, HTML tags
2	II	OOP with C++	Classes and Objects
3	III	DBMS	Insert, update, delete, select queries
4	IV	Core Java	Looping and Conditional Statements

2.c Relevance to Future Courses

No.	Semester	Name of the Course
1	V & VI	Project
2	M.Sc – Sem II	Microservice Architecture

2.d Identify real life scenarios/examples which uses the knowledge of the subject (Discussion on how to prepare examples and case studies e.g. "Boeing Plane": C Programming Language – Intro to Computer Science – Harvard's CS50 (2018) – Bing video)

Real Life Scenario	Concept Used
Paint.NET	Form Controls and Object Oriented Programming Characteristics
DX Hotels - Hotel Booking	ASP.NET Controls
City National Bank	Website Development
GoDaddy	Scalability
UPS	Updating fragmented web development process in shorter time period
Forza Horizon	High Performance
Academy of Motion Picture Arts and Sciences	.NET and SQL

3 Past Results – Division-Wise

Details	Target – Dec 2023	Dec 2022	Dec 2021	Dec 2020
Course Passing % – Average of 2 Divisions	80%	57.62%	100%	100%
Marks Obtained by Course Topper (mark/100)	95	88	88	95

	Div A		Div B		Div C		Div D		Div E	
Year	Initials of Teacher	% Result	Initials of Teacher	% Result	Initials of Teacher	% Result	Initials of Teacher	% Result	Initials of Teacher	% Result
Dec 2022	SC	64.06%	HT	52.11%	SG	59.74%	HT	54.39%	NA	NA
Dec 2021	SC	100%	KAG	100%	SC	100%	KAG	100%	KAG	100
Dec 2020	KAG/SC	100v	KAG/SC	100%	KAG/SC	100%	KAG/SC	100%	KAG/SC	100

4 All the Learning Resources – Books and E-Resources

4.a List of Text Books (T – Symbol for Text Books) to be Referred by Students

Sr. No	Text Book Titles	Author/s	Publisher	Edition	Module Nos.
1	Beginning with ASP.NET 4.5 in C#	Mathew MacDonald	APress	2012	1.2.3.4.5

4.b List of Reference Books (R – Symbol for Reference Books) to be Referred by Students

Sr. No	Reference Book Titles	Author/s	Publisher	Edition	Module Nos.
1	C# 2015	Murach	Murach	Third	3,4
2	Murach's ASP .NET 4.6	Anne Bochm	SPD	Sixth	5
3	ASP.NET 4.0 Programming	J.Ranjilal	Tata Mcgrow	2011	4
4	Programming ASP .NET	D.Esposite	Preamtech	2011	3
5	Beginning Visual C#	K.Watson	Wrox	2011	1

4.c List of E - Books (E – Symbol for E-Books) to be Referred by Students

Sr. No	E- Book Titles	Author/s	Publisher	Edition	Module Nos.
1	Beginning with ASP.NET 4.5 in C#	Mathew MacDonald	APress	2012	1.2.3.4.5
2	C# 2015	Murach	Murach	Third	3,4
3	Murach's ASP .NET 4.6	Anne Boehm	SPD	Sixth	5
4	ASP.NET 4.0 Programming	J.Ranjilal	Tata Mcgraw	2011	4
5	Programming ASP .NET	D.Esposite	Preamtech	2011	3
6	Beginning Visual C#	K.Watson	Wrox	2011	1

4.d Reading latest / top rated research papers (at least 5 papers)

Name of Paper	Name of Authors (Background)	Published in		Problem Statement
		Date	Journal	
Implementation and Comparison of MVC Model in ASP.net Framework and PHP Framework	Sonal J. Patel & Pooja D. Pancholi, Department of Compute Science, Ganpat University	October 23, 2018	IJRAR- International Journal of Research and Analytical Reviews	Draw a neat diagram of MVC Architecture and Write functionality of each component.

A Comparative Study of C, C++, C# and Java Programming Languages: Underpinning Structure Equation Modeling, Data Structures and Algorithm	Sanja Michael Mutongwa, School of Postgraduate, Depart of Information Technology, University of Kigali, Rwanda Silvance Abeka, Informatics and Innovative Systems, University of Science & Technology (JOOUST), Bondo, Kenya	2019	Journal of Scientific and Engineering Research, 2019	Differentiate between C, C++, C# and Java language from the paper.
The Effects of Objects-First and Objects-Late Methods on Achievements of OOP Learners	Murat Pasa Uysal, Department of MIS and Decision Sciences, Rochester, USA	September 29, 2012	Journal of Software Engineering and Applications	Write a C# program to create class of employees which get and displays employee details with the help of object and method concept.
Aspect-oriented programming with C# and .NET	W. Schult, A. Polze, Hasso Plattner Institute, University Potsdam, Germany	August 07, 2002	IEEE Explore	Explain about implementation of Aspect-Oriented Programming in C#.
Experience in integrating Java with C# and .NET	Judith Bishop1, R. Nigel Horspool and Basil Worrall, Computer Science Department, University of Pretoria	September 09, 2002	Concurrency and Computation : Practice and Experience	Code to Link Java to C# via JNI

4.e Based on research paper an identify the current Problem statement

Problem Statement			Used in				
	Quiz	Assignment	Lab	Mini Project	Poster Presentation	Test	Any Other
Draw a neat diagram of MVC Architecture and Write functionality of each component.		Y					
Differentiate between C, C++, C# and Java language from the paper.					Y		True or False
Write a C# program to create class of employees which get and displays employee details with the help of object and method concept.		Y	Y				
Write a structure to implement Aspect Oriented Programming.		Y					
Code to Link Java to C# via JNI			Y				

4.f Identify Companies / Industries which use the knowledge of the subject and thus may provide Internships and final Placements

Name of the Company	To be / Contacted for		
	Student Internship	Student Final Placement	Faculty Internship
IGNITE BUSINESS CATALYST(IBC) http://ignitebusinesscatalyst.com/	✓	✓	

4.g Identify suitable relevant TOP Guest Speakers from Industry

(CS50 Lecture by Mark Zuckerberg - 7 December 2005 - YouTube)

Name of the Identified Guest Speaker	Designation	Name of the Company
Varsharani Budde	Lead Developer	Cognizant

4.h Identify relevant Technical competitions to participate [Competitions -Paper Presentations, Projects, Hackathons, IVs etc..]

Name of the Relevant Technical Competition Identified to participate	Organized by	Date of the Event
V – Search	VSIT	February 2023
Poster Presentation	VSIT	Yet to be decided
Microsoft Imagine Cup(https://imaginecup.microsoft.com/en-us/Events)	Microsoft	Yet to be decided

4.i Identify faculty in TOP schools / Universities who are teaching same / similar subject and develop rapport e.g. Exchange Lecture Material (Assignments / Tests / Project etc..), Joint Paper Publication

University	Name of the Course	Name of Faculty	Type of Collaboration		
			Exchange of Lecture Material	Joint Publication/ Research	Other
NM College	Advanced Web Programming	Anupama Jawale	Yes	-	-

4.j Module Best Available in - Title best resource [from *4.a* to *4.d* in this AAP] & give details

Module No.	Title of the Module	Web Link	Mention the Tile			
			Journal	E-Journal	Magazine	Other Resource
1	Introducing .NET, C# Languages, Types, Objects & Name spaces	www.w3schools.com/cs/index.php	aspdotnet.livejournal.com		https://visualstudiomagazine.com/Home.aspx MSDN Magazine - msdn.microsoft.com	
2	Webform Fundamentals & various Webform Controls	www.tutorialspoint.com/asp.net/index.htm				
3	Error handling, Logging & tracing state management, Style themes & Master pages	https://www.youtube.com/watch?v=IzlwwDPC7pk				
4	ADO.NET Fundamentals, Data Binding	https://www.javatpoint.com/ado-net-introduction				
5	XML, Security Fundamentals, ASP.NET AJAX	https://www.c-sharpcorner.com/article/ajax-in-asp-net/				

4.k Referred to any top-rated university in that subject for content

University	Name of the Course	Name of Faculty	Date of Delivery of the Course	Remarks
University of Calgary	Building Web Applications with Microsoft ASP.NET and C#		Jun 28, 2023 to Aug 02, 2023	https://conted.ucalgary.ca/

4.l **Faculty received any certification related to this subject. List of Certifications Identified / Done**

Course	Certifying Agency	No. of Hours	Level of the Course		Certification		Remarks
			Introductory	Advance Skill Development	Done on	Proposed to be on	
MVC Architecture	Cerelabs	30Hrs	Y		2016		

4.m **Completed subject wise/cluster wise training with cluster mentor. List of relevant Refresher Course Identified / Done**

Course	Certifying Agency (As suggested by DAB/Cluster Mentor/Industry/ University other than MU)	Certification		Remarks
		Done on	Proposed to be on	
Pedagogy				
PBL				
Sub. Content Training				

4.n **Best Practices Identified and adopted**

No.	Item	Best Practices Identified		
		Univ. 1 – Microsoft	Univ. 2 – Amity University	Univ. 3 – Stanford University
1	Microsite			
2	Video Lectures	✓		✓
3	Assignments		✓	✓
4	Mini Project			
5	Assessment Metric			
6	Quizzes	✓		✓
7	Labs/ Practical (PBL)	✓		✓
8	Tests			
9	Peer Assessment			
10	Any Other			

4.o Web Links for Online Notes/YouTube/VSIT Digital Content/VSIT Lecture Capture/NPTEL Videos

Students can view lectures by VSIT professors, captured through LMS 'Lecture Capture' in VSIT campus for previous years.

No.	Websites / Links	Module Nos.
1	Digital Content (live.vsit.edu.in/vrefer)	1-5
2	www.w3schools.com/cs/index.php	1-5
3	www.asp.net-tutorials.com	1
4	www.msd.microsoft.com	1
5	www.tutorialspoint.com/asp.net/index.htm	1
6	*www.mva.microsoft.com*	2
7	**Insert Update Delete and View With Sql Server Database** *https://www.youtube.com/watch?v=CtDE9gTwmyo*	2
8	**Master Pages** *https://www.youtube.com/watch?v=IzlwwDPC7pk*	3
9	**ADO.NET Introduction** https://www.youtube.com/watch?v=5E9aUXQCsGA	4
10	**Ajax Controls in Asp Net using C#** https://www.youtube.com/watch?v=hOyeQFS4pcc	5
11	**Modern Application Development** **https://www.youtube.com/watch?v=FPtLsZ62pdA&t=2s**	1, 2

4.p Recommended MOOC Courses like Coursera / NPTEL / MIT-OCW / edX/VAC etc.

Sr. No.	MOOC Course Link	Course conducted by – Person / University / Institute / Industry	Course Duration	Certificate (Y / N)
1.	mva.microsoft.com/en-us/training-courses/asp-net.core-beginner	Microsoft virtual academy	3hrs	Y
2.	https://www.udemy.com/course/csharp-tutorial-for-beginners/	Udemy	6hrs	Y

5 Consolidated Course Lesson Plan

	From (date/month/year)	From (date/month/year)	Total Number of Weeks
Semester Duration	12/06/2023		13

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
1	1	**Unit 1**	Induction		1		Textbook/ Chap-1/3,8
	2	1	**Introducing .NET:** The .NET Framework, C#, VB, and the .NET Languages		1		Textbook/ Chap-1/12,13
	3	1	The Common Language Runtime, The .NET Class Library		1		Textbook/Chap-2/15,18,25,28
	4	1	The C# Language: C# Language Basics, Variables, Variable Operations, Object-Based Manipulation		1		Textbook/Chap-2/15 Chap – 3/ 47
2	5	1	Methods Types, Objects, and Namespaces: The Basics About Classes, Assemblies		1		Textbook/Chap-3/49
	6	1	Building a Basic Class, Value Types and Reference Types		1		Textbook/Chap-3/63
	7	1	Advanced Class Programming		1		Textbook/Chap-3/68
	8	1	Advanced Class Programming		1		Textbook/Chap-2/15
3	9	1	Viva/ Students' Activity on Unit 1		1		

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
	10	1	Viva/ Students' Activity on Unit 1		1		
	SS	1	Data Types, Conditional Logic, Loops		1		
	11	**Unit 2**	**Web Form Fundamentals:** Adding Event Handlers,		2		Textbook/Chap-4/103,104
	12	2	Understanding the Anatomy of an ASP.NET Application		2		Textbook/Chap-5/121
4	13	2	Introducing Server Controls, Using the Page Class		2		Textbook/Chap-5/124
	14	2	Using Application Events		2		Textbook/Chap-5/152,154
	15	2	**Form Controls:** Stepping Up to Web Controls, Web Control Classes, List Controls, Table Controls		2		Textbook/Chap-6/163,166,175
	16	2	Web Control Events and AutoPostBack, Validation, Understanding Validation		2		Textbook/Chap-6/175, 179,184
5	17	2	Using the Validation Controls, Rich Controls, The Calendar, The AdRotator		2		Textbook/Chap-9/271 and Chap-10/293
	18	2	Pages with Multiple Views, User Controls and Graphics		2		Textbook/Chap-10/293, 301,304

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
	19	2	User Controls, Dynamic Graphics, The Chart Control,		2		Textbook/Chap-11/319,331,340
	20	2	**Website Navigation:** Site Maps, URL Mapping and Routing, The SiteMapPath Control,		2		Textbook/Chap-13/387,402,405,409,416
6	21	2	The TreeView Control, The Menu Control. Viva/ Students' Activity on Unit 2		2		Textbook/Chap-13/409,416
	22	2	Viva/ Question Solving on Unit II		2		
	SS	2	Writing Code, Using the Code-Behind Class. Configuring an ASP.NET Application		2		
	23	**Unit 3**	**Error Handling, Logging, and Tracing:** Understanding Exception Handling, Handling Exceptions, Throwing Your Own Exceptions,		3		Textbook/Chap7/ 203, 205,208,214
	24	3	Using Page Tracing **State Management:** Understanding the Problem of State, Using View State,		3		Textbook/Chap 7/ 219 Chap 8/ 233
7	25	3	Transferring Information Between Pages, Using Cookies,		3		Textbook/Chap 8/ 239,249
	26	3	Managing Session State, Configuring Session State, Using Application State, Comparing State Management Options		3		Textbook/Chap 8/ 251, 264

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
	27	3	**Styles, Themes, and Master Pages:** Themes,		3		Textbook/Chap 12/ 345,360,368
	28	3	Master Page Basics, Advanced Master Pages		3		Textbook/Chap 12/379
8	29	3	Viva/ Students' Activity on Unit 3		3		
	30	3	Viva/ Students' Activity on Unit 3		3		
	SS	3	Styles,		3		
	SS	3	Avoiding Common Errors,		3		
	31	**Unit 4**	**ADO.NET Fundamentals:** Configuring Your Database,		4		Textbook/Chap 14/ 425,427, 432
	32	4	Understanding the Data Provider Model		4		Textbook/Chap 14/ 440
9	33	4	Using Direct Data Access, Using Disconnected Data Access.		4		Textbook/Chap 14/ 441,464
	34	4	**Data Binding:** Introducing Data Binding, Using Single-Value Data Binding,		4		Textbook/Chap 15/ 473,474
	35	4	Using Repeated-Value Data Binding,		4		Textbook/Chap 15/ 480

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
	36	4	Working with Data Source Controls,		4		Textbook/Chap 15/ 494
10	37	4	**The Data Controls:** The GridView, Formatting the GridView,Selecting a GridView Row, Editing with the GridView, Sorting and Paging the GridView		4		Textbook/Chap 16/ 511,518, 524,528,531
	38	4	Using GridView Templates,		4		Textbook/Chap 16/ 535, 544,547
	39	4	DetailsView, FormView		4		Textbook/Chap 16/ 544,547
	40	4	Viva/ Students' Activity on Unit 4		4		
	SS	4	Understanding SQL Basics		4		
	SS	4	Understanding Databases		4		
11	41	4	Viva/ Students' Activity on Unit 4		4		
	42	**Unit 5**	**XML:** XML Explained, The XML Classes, XML Validation		5		Textbook/Chap 18/ 581
	43	5	XML Display and Transforms.		5		Textbook/Chap 18/ 602,617
	44	5	**Security Fundamentals:** Authentication and Authorization, Forms Authentication, Windows Authentication.		5		Textbook/Chap 19/ 619

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
12	45	5	**ASP.NET AJAX:** Understanding Ajax, Using Partial Refreshes,		5		Textbook/Chap 19/ 634 Textbook/Chap 25/791,794
	46	5	Implementing Timed Refreshes,		5		Textbook/Chap 25/805,809
	47	5	Working with the ASP.NET AJAX Control Toolkit.		5		Textbook/Chap 25/811
	48	5	Working with the ASP.NET AJAX Control Toolkit.		5		Textbook/Chap 25/811
13	49	5	Viva/ Students' Activity on Unit 5		5		
	50	5	Viva/ Students' Activity on Unit 5		5		
	SS	5	Understanding Security Requirements		5		
	SS	5	Using Progress Notification		5		

6 Rubric for Grading and Marking of Term Work (inform students at the beginning of semester)

Lecture + Practical (% of class participation) & Marks	Assign-ments	Tutorial	Lab / Practical Performance	Lab Journal Assessment	Class Tests (Other than IA)	Other (1) specify	Other (2) specify	Total
75% Attendance	10	-	Practical Exam – 40 Marks Viva – 05	05		IA (Descriptive) of 20 MarksScaled to 15 Marks		75

7 Assignments / Tutorials Details

Assignment/ Tutorial No.	Title of the Assignments / Tutorials	CO Map	Assignment/ Tutorials given to Students on	Week of Submission
1	Introduction to .NET, C# Language, Types, Objects, Namespaces	CO1	3rd Week	4th Week
2	ASP.Net PBL	CO2	5th Week	6th Week
3	ADO.NET OBT	CO4	10th Week	11th Week

Analysis of Assignment / Tutorial Questions and Related Resources

Assignment / Tutorial No.	Week No.	Type* (√)			Module No.	Based on #			Question Type (√)	
		R	PQ	OBT		Text Book	Reference Book	Other Learning Resource	MU EQ	Thought Provoking
1	3	√			1	√	√		√	√
2	5		√		2	√	√		√	
3	10			√	5	√			√	√

* Tick (√) the Type of the Assignment: Regular (R); Pop Quiz (PQ) ; Open Book Test for TE/BE/ME (OBT)
# Write number for text book, reference book, other learning resource from this AAP – *from Points 4.a to 4.d*

8 Internal Assessment / Other Class Test / Open Book Test (OBT)/Take Home Test (THT) Details

Tests	Test Dates	Module No.	CO Map	IA Question Paper Pattern	Policy
1st IA Test	8th week	1,2	1,2	Q1 – 10 Marks Q2 – 10 Marks	No IA Re-test IA is a Head of passing *
One minute paper	9th & 12th week	3,4	3,4		
Pop Quiz	After each Unit	1-5	1-5		
Open Book Test	6th week	4	4		
Take Home Test	5th & 9th Week	1,3	1,3		

Class tests / prelims					
Class tests / prelims					
Any other test/exams					

*** Failures of IA test (IA1+IA2) shall appear for IA test in the next semester. There is no provision for re-test in the same semester.**

9.a Practical Activities

Practical No.	Module No.	Title of the **Experiments**	Type of Experiment		Topics to be highlighted	CO Map
			PBL	Newly Added		
1	1	Working with basic C# and ASP .NET			C# basics	C01
2	1	Working with Object Oriented C# and ASP .NET			OOP Properties	C01
3	2	Working with Web Forms and Controls			Web Forms	C02
4	2	Working with Form Controls			Advanced Web Form Controls	C02
5	3	Working with Navigation, Beautification and Master page.			Styles and Master Pages	C03
6	4	Working with data controls			Data Binding	CO4
7	4	Working with Database			Database Connection	CO4
8	5	Working with AJAX and XML			Partial Page Refresh	CO5
9	2,3,4	Develop a website to implement any real time scenario	✓		Website Creation	CO5
10	5	Creating Simple MVC Application using ASP.NET with C#		✓	MVC	CO5

10 Beyond Syllabus Activities for Gap Mitigation

No.	Type of the Activity	Activities	Number of beneficiaries	Other Details – guest profile, feedback, mark sheet, report
1	**Experiential learning/Interaction with Outside World**	1- Guest Lectures by Industry Expert		
		2- Workshops	100	Athar Ansari, IGNITE BUSINESS CATALYST(IBC) http://ignitebusinesscatalyst.com/
		3- Mini Project	50	
		4- Industrial Visit		
		5- Any other activity		
2	**Collaborative & Group Activity**	6- Poster Presentation	50	
		7- Minute Papers		
		8- Students Seminars		
		9- Students Debates		
		10- Panel Discussion / Mock GD		
		11- Mock Interview		
		12- Any other activity		
3	**Co-Curricular Activity**	13- Informative videos (NPTEL/Youtube /TEDx/ MIT OW/edX)	100	
		14- Lecture Capture Usage		
		15- Any other activity		
4	**Tests & Assessments**	16- Class Tests/ Weekly Tests		
		17- Pop Quiz	100	
		18- Mobile App Based Quiz		

19- Open Book Test	100
20- Take Home Test	100
21- Any other activity	

11.1 One-on-One Academic Mentoring Meetings done

No.	Name of Mentee	Date of One-On-One Meeting		
		Beginning of Sem.	After Mid Term Results	Before End Sem.

11.2 Identify concerns and refer appropriately

No.	Name of Mentee	Action Taken		
		Individual Goals Identified	Any Financial Concern which needs to be referred to	Any Emotional Concern to be referred to

*** Do not delete any activity. Give details for planned events. Write 'NA' for activity Not Planned.**

Consolidated Academic Administration Plan Prepared by (mention all theory teaching faculty names with signature)

Please write below your name and sign with date of the external cluster mentor meeting

Dr. Pallavi Tawde	Ms. Seema Murkar		
External Industry Mentor	External Academic Mentor	VSIT Cluster Mentor	Program HOD
VENKATA SATISH GUTTULA			

VSIT
Vidyalankar School of Information Technology

Version 2023-1

Consolidated Academic Administration Plan for the Course

Computer Graphics & Animation

Sem. IV – Program B.Sc. IT 2023-24 – Even Semester

Faculty - Prof. Geeta S, Prof. Leena J

The academic resources available in VSIT

VMIS (ERP)	V-Refer and V-Live	VSIT Library	VAC & MOOC Courses
Institute & Department Vision and Mission	Former IA question papers and solutions (prepared by faculty)	Former IA question papers solutions - hardcopy	Value Added Courses (VAC) are conducted throughout the semester & in the semester break - Enrol for the VACs
Program Educational Objectives (PEO)	MU end semester examination question papers and solutions (prepared by faculty)	MU end semester exam question paper & solutions - by faculty, hardcopy	
Program Specific Outcome (PSO)	Class notes and Digital Content for the subject (scanned / typed by faculty)	All textbooks, reference books, e -books mentioned in the syllabus & AAP	Online courses from NPTEL, Coursera etc. are pursued throughout the semester - Register for the course & get certified
Program Outcome (PO)	Comprehensive question bank, EQ, GQ, PPT, Class Test papers	Technical journals and magazines for reference	
Departmental Knowledge Map	Academic Administration Plan & Beyond Syllabus Activity report	VSIT library is member of IIT Bombay Library	Watch former lectures captured in LMS at VSIT

1.a Course Objectives (Write in detail – as per NBA guidelines)

Cognitive	What do you want students to know?	To introduce students with fundamentals of Computer Graphics.
Affective	What do you want students to think / care about?	Students should know how objects are projected in an animated movie using transformations.
Behavioural	What do you want students to be able to do?	To understand basics of animation using simple programs.

Advice to Students:

Attend every class!!! Missing even one class can have a substantial effect on your ability to understand the course. Be prepared to think and concentrate, in the class and outside. I will try to make the class very interactive. Participate in the class discussions. Ask questions when you don't understand something. Keep up with the class readings. Start assignments and homework early. Meet me in office hour to discuss ideas, solutions or to check if what you understand is correct.

Collaboration Policy:

We encourage discussion between students regarding the course material. However, no discussion of any sort is allowed with anyone on the assignment and homework for the class. If you find solution to some problems in a book or on the internet, you may use their idea for the solution; provided you acknowledge the source (name and page in the book or the website, if the idea is found on the internet). Even though you are allowed to use ideas from another source, you must write the solution in your own words. If you are unsure whether or not certain kinds of collaboration is possible, please ask the teacher.

1.b Course Outcome (CO) Statements and Module-Wise Mapping (follow NBA guideline)

CO No.	Statements	Related Module/s
CO1	To understand basics of computer graphics and its applications.	Unit 1
CO2	Develop an understanding for 2D,3D transformations.	Unit 2
CO3	Learning the technique of 3D viewing with respect to camera modelling along with introduction of light and color.	Unit 3
CO4	Understanding different algorithms for visible surface detection and formulation of curves & surfaces.	Unit 4
CO5	Overview of animation process and theory to understand image processing techniques.	Unit 5

1.c Mapping of COs with POs (mark S: Strong, M: Moderate, W: Weak, Dash '–': not mapped)

(List of POs is available in V-refer)

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

1.d Mapping of COs with PSOs (mark S: Strong, M: Moderate, W: Weak, Dash '–':not mapped)

	PSO 1	PSO 2	PSO 3	PSO 4
CO 1				
CO 2				
CO 3				
CO 4				
CO 5				

1.e Teaching and Examination Scheme (As specified by the University) for the Course

Categories	Humanities and Social Sciences	Basic Science	Engineering Science	Professional Core	General Education	Professional Elective	Project/ Internship	Open Elective
Tick suitable category			√					

Subject Code	Subject Name	Teaching Scheme			Credits Assigned			
		Theory	Practical	Tutorial	Theory	TW/Practical	Tutorial	Total
USIT 405	Computer Graphics & Animation	75	50	-	2	2	-	4
USIT4P5	Computer Graphics & Animation	-	50	-	-	2	-	2

Subject Code	Subject Name	Examination Scheme							
		Theory Marks IA Test			End Sem. Exam Marks	TW	Practical	Oral	Total
		IA 1	IA 2	Average of IA1 and IA2					
USIT 405	Computer Graphics & Animation	20	-	-	75	25	50	-	150
USIT4P5	Computer Graphics & Animation	-	-	-	-	-	45	5	50

1.f Faculty-Wise Distribution of all Lecture-Practical-Tutorial Hours for the Course

Divisions	Lecture (Hrs.)	Practical (Hrs.)				Tutorial (Hrs.)			
		Batch 1	Batch 2	Batch 3	Batch 4	Batch 1	Batch 2	Batch 3	Batch 4
A	4.00	2	2						
B	4.00	2	2						
C	4.00	2	2						
D	4.00	2	2						
F1	4.00	2	2						
F2	4.00	2	2						

1.g Office Hours (Faculty will be available in office in this duration for solving students' query)

Division	Day	Time (at least 1 Hr. / Division)	Venue (Office Room No.)
A	Monday	2.30 pm to 3.30 pm	IT staff room
B	Tuesday	2.30 pm to 3.30 pm	IT staff room
C	Wednesday	2.30 pm to 3.30 pm	IT staff room
D	Thursday	2.30 pm to 3.30 pm	IT staff room
E	Friday	2.30 pm to 3.30 pm	IT staff room
F	Friday	3.30 pm to 4.30 pm	IT staff room

2.a Syllabus: Module Wise Teaching Hours and % Weightage in University Question Paper

Module No.	Module Title and Brief Details	Teaching Hrs. for each module	% Weightage in University Question Papers
1	Introduction to Computer Graphics and Scan conversion	10	20
2	Two-Dimensional Transformations and Three-Dimensional Transformations	15	20
3	Viewing in 3D, Light and Color	6	20
4	Visible-Surface Determination, Plane Curves and Surfaces	10	20
5	Computer Animation and Image Manipulation and Storage	9	20
* Insert rows for more modules in the Course	**Total**	**50*60 min =50 hrs**	**100**

2.b Prerequisite Courses

No.	Semester	Name of the Course	Topic/s
1	I	Imperative Programming	Basic programming in C
2	II	Object Oriented Programming with C++	OOP Concepts in C++
3	II	Applied Mathematics	Linear Algebra and Geometry

2.c Relevance to Future Courses

No.	Semester	Name of the Course
1	VI	B. Sc. IT (Principles of Geographic Informative Systems)
2	II	M. Sc. IT (Image Processing)

2.d Identify real life scenarios/examples which uses the knowledge of the subject (Discussion on how to prepare examples and case studies e.g. "Boeing Plane": C Programming Language – Intro to Computer Science – Harvard's CS50 (2018) – Bing video)

Real Life Scenario	Concept Used
Movies, Games (Snakes), Animation, Entertainment, Cartoon	Animation Principles
2D, 3D Drawings, Education & Training, Visualization	2D,3D concepts

3 Past Results – Division-Wise

Details	Target – Apr 2023	Apr 2022	Apr 2021	Apr 2020
Course Passing % – Average of 2 Divisions	95	100	100	100
Marks Obtained by Course Topper (mark/100)	98	97	95	98

	Div A		Div B		Div C		Div D		Div E		Div F	
Year	Initials of Teacher	% Result	Initials of Teacher	% Result	Initials of Teacher	% Result	Initials of Teacher	% Result	Initials of Teacher	% Result	Initials of Teacher	% Result
Apr 2022	LRJ	100	RMD	100	LRJ	100	RMD	100	-	-	RMD	100
Apr 2021	RMD, MDA	100	RMD, MDA	100	RMD, MDA	100	RMD, MDA	100	RMD, MDA	100	RMD, MDA	100
Apr 2020	JMV	100	RMD	100	MDA	98.44	RMD	98.36	JMV	100	MDA	97.06

4 All the Learning Resources – Books and E-Resources

4.a List of Textbooks (T – Symbol for Textbooks) to be Referred by Students

Sr. No	Textbook Titles	Author/s	Publisher	Edition	Module Nos.
1	Computer Graphics - Principles and Practice	J. D. Foley, A. Van Dam, S. K. Feiner and J. F. Hughes	Pearson	2nd	Unit 1
2	Fundamentals of Computer Graphics	Steve Marschner, Peter Shirley	CRC Press	4th	Unit 2, 3 & 5

4.b List of Reference Books (R – Symbol for Reference Books) to be Referred by Students

Sr. No	Reference Book Titles	Author/s	Publisher	Edition	Module Nos.
1	Computer Graphics - Principles and Practice	J. D. Foley, A. Van Dam, S. K. Feiner and J. F. Hughes	Pearson	2nd	Unit 1
2	Fundamentals of Computer Graphics	Steve Marschner, Peter Shirley	CRC Press	4th	Unit 2, 3 & 5
3	Computer Graphics	Hearn, Baker	Pearson	2nd	All
4	Principles of Interactive Computer Graphics	William M. Newman and Robert F. Sproull	TMH	2nd	Unit 5
5	Mathematical Elements for CG	D. F. Rogers, J. A. Adams	TMH	2nd	Unit 2 & 3
6	Basics of Computer Graphics	Atul.P. Godse	Technical	1st	Unit 1 & 2

4.c List of E - Books (E – Symbol for E-Books) to be Referred by Students

Sr. No	E- Book Titles	Author/s	Publisher	Edition	Module Nos.
1	Computer Graphics : http://lib.myilibrary.com	Hearn, Baker	Pearson	2nd	All
2	Fundamentals of Computer Graphics: http://lib.myilibrary.com	Shirley	CRC press	4th	Unit 2,3,5

4.d Reading latest / top rated research papers (at least 5 papers)

Name of Paper	Name of Authors (Background)	Published in		Problem Statement
		Date	Journal	
A literature review of various steganography methods	Mustafa Muneeb Taher, rana sami Hameed, College of Computing Science & Information Technology, University of Tenaga, Malaysia	March 2022	Journal of Theoretical and Applied Information Technology	To examine and compare several steganography methods using characteristics such as PSNR, MSE, and Robustness
My dietitian-monitoring of dietary habits by maintaining calories count through image processing	Jadhav Akash Ananda, Adkar Santosh Dattu, Pooja Rajendra Nilve	December-2021	International Research Journal of Modernization in Engineering Technology and Science	This system presents an effective way to measure and manage the daily food intake of the user. From the input food images, the users can understand the number of calories they will take in each meal by using the Support Vector Machine (SVM) algorithm
Manufacturing industry workplace safety using image processing	Tony Punnoose Valayi, Dhinesh Kumar, Hari Krishnan	September 2020	Journal of Advanced Research in Industrial Engineering	The safety measure which focuses is intruder awareness and object misplacement. Intruder awareness deals about person entering an area where he/she had no authority.
Extensive study of 2d transformations in computer graphics	Ankur Rana, Sandhya Samant, Abhishek Agarwal Assistant Professor, Department of Computer Science Quantum University, Roorkee, India	May 2019	International Journal of Engineering Research & Technology	Overview of various 2D Transformations in Computer Graphics. 2D graphics uses a two-dimensional representation of the real-world objects, stored as images in the computer for being manipulated and rendered.
Visible Surface Detection Algorithms: A Review	Nisha Assistant Professor, Department of computer science, University of Delhi, India	2017	International Journal of Advanced Engineering Research and Science	Comparative Study of different visible surface detection algorithms

4.e **Based on research paper an identify the current Problem statement**

Problem Statement			Used in				
	Quiz	Assignment	Lab	Mini Project	Poster Presentation	Test	Any Other
To examine and compare several steganography methods using characteristics such as PSNR, MSE, and Robustness		Yes					
System presents an effective way to measure and manage the daily food intake of the user. From the input food images, the users can understand the number of calories they will take in each meal by using the Support Vector Machine (SVM) algorithm							Summarization of technique used
The safety measure which focuses is intruder awareness and object misplacement. Intruder awareness deals about person entering an area where he/she had no authority.						Yes	
overview of various 2D Transformations in Computer Graphics. 2D graphics uses a two-dimensional representation of the real-world objects, stored as images in the computer for being manipulated and rendered.	Yes						
Comparative Study of different visible surface detection algorithms					Yes		

4.f Identify Companies / Industries which use the knowledge of the subject and thus may provide Internships and final Placements

Name of the Company	To be / Contacted for		
	Student Internship	Student Final Placement	Faculty Internship
Chandel Production studio, Dadar	yes	-	-

4.g Identify suitable relevant TOP Guest Speakers from Industry

(CS50 Lecture by Mark Zuckerberg - 7 December 2005 - YouTube)

Name of the Identified Guest Speaker	Designation	Name of the Company
Mr. Ishan Shukla	Indian Animation Film Maker	Creator- Schirkoa

4.h Identify relevant Technical competitions to participate [Competitions -Paper Presentations, Projects, Hackathons, IVs etc..]

Name of the Relevant Technical Competition Identified to participate	Organized by	Date of the Event
Poster Presentation	VSIT	To be decided

4.i Identify faculty in TOP schools / Universities who are teaching same / similar subject and develop rapport e.g. Exchange Lecture Material (Assignments / Tests / Project etc..), Joint Paper Publication

University	Name of the Course	Name of Faculty	Type of Collaboration		
			Exchange of Lecture Material	Joint Publication/ Research	Other
Mumbai	Computer Graphics	Ms. Ashwini Gaikwad	Yes	-	-

4.j Module Best Available in - Title best resource [from *4.a* to *4.d* in this AAP] & give details

Module No.	Title of the Module	Web Link	Mention the Tile			
			Journal	E-Journal	Magazine	Other Resource
1	Introduction to Computer Graphics and Scan conversion	https://www.tutorialspoint.com/computer_graphics/line_generation_algorithm.htm	-	√		Reference Book
2	Two-Dimensional Transformations and Three-Dimensional Transformations	https://www.tutorialspoint.com/computer_graphics/2d_transformation.htm http://mathinsight.org/determinant_linear_transformation	-			Reference Book

3	Viewing in 3D, Light and Color	https://www.creativebloq.com	-			Reference Book
4	Visible-Surface Determination, Plane Curves and Surfaces	www.cse.iitd.ac.in	-	√		Reference Book
5	Computer Animation and Image Manipulation and Storage	Visual effects | Computer Graphics www.cgw.com	-		√	Reference Book

4.k **Referred to any top-rated university in that subject for content**

University	Name of the Course	Name of Faculty	Date of Delivery of the Course	Remarks
IIT Delhi	Introduction to Computer Graphics	Prof. Prem k Kalra	2009	All Contents of Syllabus is covered. NPTEL :: Computer Science and Engineering - Introduction to Computer Graphics

4.l **Faculty received any certification related to this subject. List of Certifications Identified / Done**

Course	Certifying Agency	No. of Hours	Level of the Course		Certification		Remarks
			Introductory	Advance Skill Development	Done on	Proposed to be on	
GIMP	Spoken Tutorial IIT Bombay	15	Yes	-	2021	-	-

4.m **Completed subject wise/cluster wise training with cluster mentor. List of relevant Refresher Course Identified / Done**

Course	Certifying Agency (As suggested by DAB/Cluster Mentor/Industry/ University other than MU)	Certification		Remarks
		Done on	Proposed to be on	
Pedagogy				
PBL				
Sub. Content Training				

4.n Best Practices Identified and adopted

No.	Item	Best Practices Identified		
		SPPU, Pune University	AMITY University	D.Y. Patil University
1	Microsite	-		
2	Video Lectures	Yes	Yes	
3	Assignments			Yes
4	Mini Project			
5	Assessment Metric			
6	Quizzes	Yes		Yes
7	Labs/ Practical (PBL)		Yes	
8	Tests	Yes		
9	Peer Assessment	-		
10	Any Other	-		

4.o Web Links for Online Notes/YouTube/VSIT Digital Content/VSIT Lecture Capture/NPTEL Videos

Students can view lectures by VSIT professors, captured through LMS 'Lecture Capture' in VSIT campus for previous years.

No.	Websites / Links	Module Nos.
1	Cathode Ray Tube: https://www.youtube.com/watch?v=Gnl1vuwjHto	Unit 1
2	Cohen-Sutherland Line clipping Algorithm: https://www.youtube.com/watch?v=dQNTyVLDP5Q	Unit 1
3	Visible-Surface Determination: https://www.youtube.com/watch?v=j7zASv6vUKk&index=21&list=PLG9aCp4uE-s1DbifcNYNPz0w3oR3aZOiV	Unit 4
4	Principles of animation: https://www.youtube.com/watch?v=uDqjIdI4bF4	Unit 5
5	How to run graphics program in CodeBlocks: https://www.youtube.com/watch?v=oFUUpC9Z--U	Unit 2
6	How to setup graphics.h in CodeBlocks 20.03: https://www.youtube.com/watch?v=VEkAj-xVTKQ	Unit 3

4.p Recommended MOOC Courses like Coursera / NPTEL / MIT-OCW / edX/VAC etc.

Sr. No.	MOOC Course Link	Course conducted by – Person / University / Institute / Industry	Course Duration	Certificate (Y / N)
1	Blender – Animation and Computer Graphics https://spoken-tutorial.org/tutorial-search/?search_foss=Blender&search_language=	Spoken Tutorial	6 Hrs	Yes
2	Computer Graphics by Prof. Ravi Ramamoorthy https://www.edx.org/bio/ravi-ramamoorthi	Coursera EDX	6 weeks	Yes

5 Consolidated Course Lesson Plan

	From (date/month/year)	From (date/month/year)	Total Number of Weeks
Semester Duration	14/11/2022	April-2022	

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Activities to be conducted	Teaching Methodology (Power point, Video Clip, Simulation, Flipped Classroom, Group Discussion, any other)	COs Mapped	Recommended Prior Viewing / Reading	
							Lecture No. (on LMS)	Chapter No./ Books/ Web Site
1	1	**Unit I**	**Induction** **Introduction to Computer Graphics:** Overview of Computer Graphics Computer Graphics Application and Software		Power point, Video Clip	1	1	Chapter 1/1-4/Godse
	2		Description of some graphics devices Input Devices for Operator Interaction, Active and Passive Graphics Devices		Power point	1	2	Chapter 1/5-11/Godse
	3		Display Technologies, Storage Tube Graphics Displays, Calligraphic Refresh Graphics Displays, Raster Refresh (Raster-Scan) Graphics Displays		Power point, Video Clip	1	3	Chapter 1/12/Godse
	4		Cathode Ray Tube Basics, Color CRT Raster Scan Basics, Video Basics, The Video Controller, Random-Scan Display Processor, LCD displays.		Power point	1	4	Chapter 1/15/Godse
2	5		**Scan conversion** Digital Differential Analyzer (DDA) algorithm, Bresenhams' Line drawing algorithm.		PBL	1	5	Chapter 1/12-22/Godse
	6		Bresenhams' method of Circle drawing, Midpoint circle drawing algorithm Midpoint Ellipse Algorithm		PBL	1	6	Chapter 1/14/Godse
	7		Problems of Aliasing, end-point ordering and clipping lines, Scan Converting Circles		PBL	1	7	Chapter 2/45-47/Godse
	8		Clipping Lines algorithms-Cohen-Sutherland Line clipping algorithm, Liang-Barsky, Clipping Polygons problem with multiple components.		PBL	1	8	Chapter 2/53/Godse
3	9		Viva/ Students' Activity on Unit I		Written Assignment 1	1	9	

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Activities to be conducted	Teaching Methodology (Power point, Video Clip, Simulation, Flipped Classroom, Group Discussion, any other)	COs Mapped	Recommended Prior Viewing / Reading	
							Lecture No. (on LMS)	Chapter No./ Books/ Web Site
	10		Viva/ Students' Activity on Unit I		Written Assignment 1	1	10	
	11	**Unit II**	**Two-Dimensional Transformations:** Transformations and Matrices, Transformation Conventions			2	11	CH-04 PG-110 CG by A P Godse
	12		2D Transformations, Homogeneous Coordinates and Matrix Representation of 2D Transformations,		Power point	2	12	CH-04 PG-110, 115 CG by A P Godse
4	13		Translations and Homogeneous Coordinates, Rotation, Reflection		Power point	2	13	CH-04 PG-110, 116 CG by A P Godse
	14		Scaling, Combined Transformation, Transformation of Points,		Power point, PBL	2	14	CH-04 PG-111-113 CG by A P Godse
	15		Transformation of The Unit Square, Solid Body Transformations,		Power point	2	15	CH-04 PG-123,124 CG by A P Godse
	16		Rotation About an Arbitrary Point, Reflection through an Arbitrary Line		Power point	2	16	CH-04 PG-113,114 CG by A P Godse
5	17		A Geometric Interpretation of Homogeneous Coordinates, The Window-to-Viewport Transformations.		Power point	2	17	CH-11 PG-443 CG by Hern & Baker
	18		**Three-Dimensional Transformations:** Three-Dimensional Scaling, Shearing, Three-Dimensional Rotation,		Power point	2	18	CH-05 PG-228 CG by Hern & Baker CH-07 PG-201-227 CG by A P Godse
	19		Three-Dimensional Reflection, Three-Dimensional Translation,		Power point	2	19	CH-07 PG-228,229 CG by A P Godse
	20		Multiple Transformation, Rotation about an Arbitrary Axis in Space, Reflection through an Arbitrary Plane		Power point	2	20	CH-04 PG-128-137 CG by R K Maurya
6	21		Matrix Representation of 3D Transformations, Composition of 3D Transformations,		Power point	2	21	CG by Hern & Baker CH-07 PG-201-

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Activities to be conducted	Teaching Methodology (Power point, Video Clip, Simulation, Flipped Classroom, Group Discussion, any other)	COs Mapped	Recommended Prior Viewing / Reading	
							Lecture No. (on LMS)	Chapter No./ Books/ Web Site
								227 CG by A P Godse
	22		Affine and Perspective Geometry, Perspective Transformations, Techniques for Generating Perspective Views,		Power point	2	22	CG by Hern & Baker CH-07 PG-201-227 CG by A P Godse
	23		Vanishing Points, the Perspective Geometry and camera models, Orthographic Projections, Axonometric Projections, Oblique Projections, View volumes for projections.		Power point	2	23	CH-05 PG-228 CG by Hern & Bake CH-07 PG-201-227 CG by A P Godse
	24		Viva/ Students' Activity on Unit II		Written Assignment 2	2	24	
7	25		Viva/ Students' Activity on Unit II		Written Assignment 2	2	25	
	26	Unit V	**Computer Animation:** Principles of Animation		PowerPoint	5	26	CH-16 PG 405,406 Fundamentals of CG by Shirley
	27		Key framing, Deformations, Character Animation, Physics-Based Animation, Procedural Techniques, Groups of Objects.		PowerPoint	5	27	CH-16 PG-410-419 Fundamentals of CG by Shirley
	28		**Image Manipulation and Storage:** What is an Image? Digital image file formats		PowerPoint	5	28	CH-16 PG-410-419 Fundamentals of CG by Shirley
8	29		Image compression standard – JPEG,		PowerPoint	5	29	CH-16 PG-410-419 Fundamentals of CG by Shirley
	30		Image Processing - Digital image enhancement, contrast stretching, Histogram Equalization, smoothing and median Filtering.		PowerPoint	5	30	CH-16 PG-419-426 Fundamentals of CG by Shirley

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Activities to be conducted	Teaching Methodology (Power point, Video Clip, Simulation, Flipped Classroom, Group Discussion, any other)	COs Mapped	Recommended Prior Viewing / Reading	
							Lecture No. (on LMS)	Chapter No./ Books/ Web Site
	31		Viva/ Students' Activity on Unit V		OBT	5	31	
	32		Viva/ Students' Activity on Unit V		OBT	5	32	
9	33	Unit IV	**Visible-Surface Determination:** Techniques for efficient Visible-Surface Algorithms		PowerPoint	4	33	CH-9 9/282-298/Maurya
	34		Categories of algorithms, Back face removal, The z-Buffer Algorithm		PowerPoint, Video	4	34	CH-9 9/282-298/Maurya
	35		Scan-line method, Painter's algorithms (depth sorting),		PowerPoint	4	35	CH-9 9/282-298/Maurya
	36		Area sub-division method, BSP trees,		PowerPoint	4	36	CH-9 9/282-298/Maurya
10	37		Visible-Surface Ray Tracing, comparison of the methods.		PowerPoint	4	37	CH-9 9/282-298/Maurya
	38		**Plane Curves and Surfaces:** Curve Representation, Nonparametric Curves, Parametric Curves,		PowerPoint	4	38	CH-9 9/282-298/Maurya
	39		Parametric Representation of a Circle, Parametric Representation of an Ellipse, Parametric Representation of a Parabola, Parametric Representation of a Hyperbola, Representation of Space Curves		PowerPoint	4	39	CH-9 9/282-298/Maurya
	40		Cubic Splines, Bezier Curves, B-spline Curves, B-spline Curve Fit, other Types of Curves		PowerPoint	4	40	CH-9 9/282-298/Maurya
11	41		Viva/ Students' Activity on Unit IV		Pop Quiz	4	41	
	42		Viva/ Students' Activity on Unit IV		Pop Quiz	4	42	
	43		**Viewing in 3D** Stages in 3D viewing, Canonical View Volume (CVV), Specifying an Arbitrary 3D View, Examples of 3D Viewing,		PowerPoint	3	43	Chapter 13/452-457/Hearn & baker

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Activities to be conducted	Teaching Methodology (Power point, Video Clip, Simulation, Flipped Classroom, Group Discussion, any other)	COs Mapped	Recommended Prior Viewing / Reading	
							Lecture No. (on LMS)	Chapter No./ Books/ Web Site
	44		The Mathematics of Planar Geometric Projections, Combined transformation matrices for projections and viewing		PowerPoint	3	44	Chapter 13/474/Hearn & baker
12	45		Coordinate Systems and matrices, Camera model and viewing pyramid		PowerPoint	3	45	Chapter 13/458/Hearn & baker
	46		**Light:** Radiometry, Transport, Equation, Photometry.		PowerPoint	3	46	Chapter 13/467/Hearn & baker
	47		Color: Colorimetry, Color Spaces		PowerPoint	3	47	Chapter 13/458/Hearn & baker
	48		Chromatic Adaptation, Color Appearance		PowerPoint	3	48	Chapter 13/467/Hearn & baker
13	49		Viva/ Students' Activity on Unit IV		Take Home Test, Students Seminar	3	49	
	50		Viva/ Students' Activity on Unit IV		Take Home Test, Students Seminar	3	50	

6 Rubric for Grading and Marking of Term Work (inform students at the beginning of semester)

Lecture + Practical (% of class participation) & Marks	Assign-ments	Tutorial	Lab / Practical Performance	Lab Journal Assessment	Class Tests (Other than IA)	Other (1) specify	Other (2) specify	Total
75% Attendance, Active Participation – 10 Marks	1		40+5(Viva)	-	-	IA 1 -30 Marks, IA 2 –30 Marks Scaled to 15 Marks	-	75

7 Assignments / Tutorials Details

Assignment/ Tutorial No.	Title of the Assignments / Tutorials	CO Map	Assignment/ Tutorials given to Students on	Week of Submission
1	Sums based on Unit 1 & 2 (PBL)	Y	2nd week	3rd week
2	Assignment based on Unit 3(OBT)	Y	12th week	12th week
3	Consolidated diagrams based on all units (Take Home Test)	Y	5th week	5th week

Analysis of Assignment / Tutorial Questions and Related Resources

Assignment / Tutorial No.	Week No.	Type* (√)			Module No.	Based on #			Question Type (√)	
		R	PQ	OBT		Textbook	Reference Book	Other Learning Resource	MU EQ	Thought Provoking
1	2	√			1,2		√		NA	√
2	12		√		4		√		NA	
3	5			√	3		√		NA	√

* Tick (√) the Type of the Assignment: Regular (R); Pop Quiz (PQ) ; Open Book Test for TE/BE/ME (OBT)
# Write number for text book, reference book, other learning resource from this AAP – *from Points 4.a to 4.d*

8 Internal Assessment / Other Class Test / Open Book Test (OBT)/Take Home Test (THT) Details

Tests	Test Dates	Module No.	CO Map	IA Question Paper Pattern	Policy
1st IA Test	6th week	1,2,3	1,2,3	IA 1 (Descriptive 30M) (Scaled to 15M)	No IA Re-test IA is a Head of passing *
2nd IA Test	-	-			
Pop Quiz	11th Week	4	4		
Open Book Test	8th week	5	5		
Take Home Test	5th Week	3	3		
Class tests / prelims					
Class tests / prelims					
Any other test/exams					

*** Failures of IA test (IA1+IA2) shall appear for IA test in the next semester. There is no provision for re-test in the same semester.**

9.a Practical Activities

Practical No.	Module No.	Title of the **Experiments**	Type of Experiment		Topics to be highlighted	CO Map
			PBL	Newly Added		
1	Unit 1	The basic functions used for graphics C++ language with examples. Draw a simple hut on the screen.			Basic functions used in Computer Graphics	1
2	Unit 1	Draw a co-ordinate axis at the center of the screen. Divide your screen into four regions, draw circle, rectangle, ellipse and half ellipse in each region with appropriate message.			Combining different functions covered in Practical 1	1
3	Unit 1	Draw the basic shapes in the center of the screen. i. Circle ii. Rectangle iii. Square iv. Concentric Circles v. Ellipse vi. Line. Implement DDA line drawing algorithms.			Drawing Different shapes available with pre-defined functions Basics of Line drawing technique.	1

4	Unit 1	Implement Bresenham's Line drawing algorithms. Implement Mid-point circle drawing algorithm.			Basics of Line and Circle drawing technique.	1
5	Unit 2	Demonstrate 2D transformation (Translation, Scaling, Rotation)			2D transformations	2
6	Unit 1	Implement Cohen-Sutherland Line clipping algorithm.			Line Clipping	1
7	Unit 5	Develop a simple text screen saver using graphics functions. Perform smiling face animation using graphic functions. Draw the moving car on the screen.			Different animations using transformation technique	5
8	Unit 1, 2	Write a program to fill an object using Flood Fill Algorithm and Boundary Fill Algorithm.			Different color filling technique	1,2
9	Unit 1	Write a Program to print your name in Hindi script on console output in C.		Yes	Combining all the knowledge gained & development of application	1
10	Unit 2	Draw the shapes in the center of the screen: hexagon, pentagon, star. Write a program to implement 2D Reflection. Write a program to perform 2D Shearing.	Yes		2D transformations	2

10 Beyond Syllabus Activities for Gap Mitigation

No.	Type of the Activity	Activities	Number of beneficiaries	Other Details – guest profile, feedback, mark sheet, report
1	**Experiential learning/Interaction with Outside World**	1- Guest Lectures by Industry Expert		
		2- Workshops	100	
		3- Mini Project		
		4- Industrial Visit		
		5- Any other activity		
2	**Collaborative & Group Activity**	6- Poster Presentation		
		7- Minute Papers		
		8- Students Seminars	ALL SYIT STUDNETS	
		9- Students Debates		
		10- Panel Discussion / Mock GD		
		11- Mock Interview		
		12- Any other activity		
3	**Co-Curricular Activity**	13- Informative videos (NPTEL/YouTube /TEDx/ MIT OW/edX)	ALL SYIT STUDNETS	
		14- Lecture Capture Usage		
		15- Any other activity		
4	**Tests & Assessments**	16- Class Tests/ Weekly Tests	ALL SYIT STUDNETS	
		17- Pop Quiz	ALL SYIT STUDNETS	
		18- Mobile App Based Quiz		
		19- Open Book Test	ALL SYIT STUDNETS	
		20- Take Home Test	ALL SYIT STUDNETS	
		21- Any other activity		

11.1 One-on-One Academic Mentoring Meetings done

No.	Name of Mentee	Date of One-On-One Meeting		
		Beginning of Sem.	After Mid Term Results	Before End Sem.

11.2 Identify concerns and refer appropriately

No.	Name of Mentee	Action Taken		
		Individual Goals Identified	Any Financial Concern which needs to be referred to	Any Emotional Concern to be referred to

*** Do not delete any activity. Give details for planned events. Write 'NA' for activity Not Planned.**

Consolidated Academic Administration Plan Prepared by (mention all theory teaching faculty names with signature)

Please write below your name and sign with date of the external cluster mentor meeting

Geeta Sahu Faculty 1	Leena Jadhav Faculty 2	Faculty 3

External Industry Mentor	External Academic Mentor	Mr. Umesh Koyande VSIT Cluster Mentor	Mr. Umesh Koyande Program HOD

VSIT
Vidyalankar School of Information Technology

Version 06/23-1

Consolidated Academic Administration Plan for the Course

Java Programming

Sem. IV – Program B.Sc. IT 2023-24 – Even Semester

Faculty - Ms. Seema M., Ms. Ketaki G.

The academic resources available in VSIT –

VMIS (ERP)	V-Refer and V-Live	VSIT Library	VAC & MOOC Courses
Institute & Department Vision and Mission	Former IA question papers and solutions (prepared by faculty)	Former IA question papers solutions - hardcopy	Value Added Courses (VAC) are conducted throughout the semester & in the semester break - Enrol for the VACs
Program Educational Objectives (PEO)	MU end semester examination question papers and solutions (prepared by faculty)	MU end semester exam question paper & solutions - by faculty, hardcopy	
Program Specific Outcome (PSO)	Class notes and Digital Content for the subject (scanned / typed by faculty)	All text books, reference books, e -books mentioned in the syllabus & AAP	Online courses from NPTEL, Coursera etc. are pursued throughout the semester - Register for the course & get certified
Program Outcome (PO)	Comprehensive question bank, EQ, GQ, PPT, Class Test papers	Technical journals and magazines for reference	
Departmental Knowledge Map	Academic Administration Plan & Beyond Syllabus Activity report	VSIT library is member of IIT Bombay Library	Watch former lectures captured in LMS at VSIT

1.a Course Objectives (Write in detail – as per NBA guidelines)

Cognitive	What do you want students to know?	• Understand the concept of OOP as well as the purpose and usage principles of inheritance, polymorphism, encapsulation and method overloading.
Affective	What do you want students to think / care about?	• Identify classes, objects, members of a class and the relationships among them needed for a specific problem. • Apply object-oriented programming concepts in problem solving through JAVA
Behavioural	What do you want students to be able to do?	• Create Java application programs using sound OOP practices (e.g., interfaces and APIs) and proper program structuring (e.g., by using access control identifies, automatic documentation through comments, error exception handling). • Develop programs using the Java Collection API as well as the Java standard class library • . Use testing and debugging tools to automatically discover errors of Java programs as well as use versioning tools for collaborative programming/editing.

Advice to Students:

Attend every class!!! Missing even one class can have a substantial effect on your ability to understand the course. Be prepared to think and concentrate, in the class and outside. I will try to make the class very interactive. Participate in the class discussions. Ask questions when you don't understand something. Keep up with the class readings. Start assignments and homework early. Meet me in office hour to discuss ideas, solutions or to check if what you understand is correct.

Collaboration Policy:

We encourage discussion between students regarding the course material. However, no discussion of any sort is allowed with anyone on the assignment and homework for the class. If you find solution to some problems

in a book or on the internet, you may use their idea for the solution; provided you acknowledge the source (name and page in the book or the website, if the idea is found on the internet). Even though you are allowed to use ideas from another source, you must write the solution in your own words. If you are unsure whether or not certain kinds of collaboration is possible, please ask the teacher.

1.b Course Outcome (CO) Statements and Module-Wise Mapping (follow NBA guideline)

CO No.	Statements	Related Module/s
CO1	Learn the architecture of Java	Unit 1
CO2	Identify data types, control flow, classes, inheritance, exceptions and event handling	Unit 1 & 2
CO3	Use object-oriented concepts for problem solving real-life applications	Unit 2 & 3
CO4	Build GUI programs	Unit 4 & 5
CO5	Create event driven programs using java.	Unit 3, 4 & 5

1.c Mapping of COs with POs (mark S: Strong, M: Moderate, W: Weak, Dash '–': not mapped)

(List of POs is available in V-refer)

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO 1	W	W	W	M	W							
CO 2	S	M	M	M	S							
CO 3	S	S	S	S	S							
CO 4	M	W	M	W	M							
CO 5	S	S	S	M	S							

1.d Mapping of COs with PSOs (mark S: Strong, M: Moderate, W: Weak, Dash '–':not mapped)

	PSO 1	PSO 2	PSO 3	PSO 4
CO 1				
CO 2				
CO 3				
CO 4				
CO 5				

1.e Teaching and Examination Scheme (As specified by the University) for the Course

Categories	Humanities and Social Sciences	Basic Science	Engineering Science	Professional Core	General Education	Professional Elective	Project/ Internship	Open Elective
Tick suitable category				✓				

Subject Code	Subject Name	Teaching Scheme			Credits Assigned			
		Theory	Practical	Tutorial	Theory	TW/Practical	Tutorial	Total
USIT401	Core Java	75	50	-	2	2	-	4

Subject Code	Subject Name	Examination Scheme							
		Theory Marks IA Test			End Sem. Exam Marks	TW	Practical	Oral	Total
		IA 1	IA 2	Average of IA1 and IA2					
USIT401	Core Java	20 (Scaled down to 15)	-	15 +10(active participation)	75	25	50	-	150

1.f Faculty-Wise Distribution of all Lecture-Practical-Tutorial Hours for the Course

Divisions	Lecture (Hrs.)	Practical (Hrs.)				Tutorial (Hrs.)			
		Batch 1	Batch 2	Batch 3	Batch 4	Batch 1	Batch 2	Batch 3	Batch 4
Div A	4	2	2	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Div B	4	2	2	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Div C	4	2	2	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Div D	4	2	2	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Div F	4	2	2	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

1.g Office Hours (Faculty will be available in office in this duration for solving students' query)

Division	Day	Time (at least 1 Hr. / Division)	Venue (Office Room No.)
Div A,B,C,D,E,F	Monday	9:00a.m – 10:00a.m	X-011

2.a Syllabus : Module Wise Teaching Hours and % Weightage in University Question Paper

Module No.	Module Title and Brief Details	Teaching Hrs. for each module	% Weightage in University Question Papers
1	Introduction & Classes	12	20

2	Inheritance & Interfaces	7	20
3	Exceptions, Multithreading & Packages	11	20
4	Introduction to JFC and Swing, Layouts, Event Handling	10	20
5	Advanced Swing Controls, JDBC	10	20
* Insert rows for more modules in the Course	**Total**	**50**	**100**

2.b Prerequisite Courses

No.	Semester	Name of the Course	Topic/s
1	1	Programming Principles with C	ALL
2	2	Object Oriented Programming with C++	ALL
3	3	Python Programming	ALL

2.c Relevance to Future Courses

No.	Semester	Name of the Course
1	5	Enterprise Java
2	5	NGT
3	6	Projects

2.d Identify real life scenarios/examples which uses the knowledge of the subject (Discussion on how to prepare examples and case studies e.g. "Boeing Plane": C Programming Language – Intro to Computer Science – Harvard's CS50 (2018) – Bing video)

Real Life Scenario	Concept Used
OTT platforms such as Netflix use Java in the backend	Scalability
E-Commerce applications such as eBay, Amazon, Broadleaf, Wayfair	User Interface
Scientific Applications such as MATLAB	Interpreter is written in Java
Web Servers Applications such as Tomcat	Implements core Java enterprise specifications, like servlets
Google uses Java to build and develop Google Docs applications	Applets
Big Data Technologies – Hadoop, Apache HBase, ElasticSearch, Accumulo	Interface
Embedded Systems – SIM Cards, Blue-ray disc player	Garbage Collector, User Interface

3 Past Results – Division-Wise

Details	Target – Apr 2023	Apr 2022	Apr 2021	Apr 2020
Course Passing % – Average of 2 Divisions	100	99.67	99.70	90.05
Marks Obtained by Course Topper (mark/100)	90	88	88	95

	Div A		Div B		Div C		Div D		Div E		Div F	
Year	Initials of Teacher	% Result	Initials of Teacher	% Result	Initials of Teacher	% Result	Initials of Teacher	% Result	Initials of Teacher	% Result	Initials of Teacher	% Result
Apr 2023	KG		KG		SB		SB		NA	NA	AR	
Apr 2022	KG	100	KG	98.46	SB	100	KG	100	NA	NA	AR	100
Apr 2021	SB/KG	100	SB/KG	100	SB/KG	100	SB/KG	98.36	SB/KG	100	AR	100
Apr 2020	BK	100	SBB	100	BK	98.44	SBB	98.36	SBB	100	AR	97.06

4 All the Learning Resources – Books and E-Resources

4.a List of Text Books (T – Symbol for Text Books) to be Referred by Students

Sr. No	Text Book Titles	Author/s	Publisher	Edition	Module Nos.
1	Core Java 8 for Beginners	Vaishali Shah, Sharnam Shah	SPD	1	1-5
2	Java: The Complete Reference	Herbert Schildt	TMH	9	1-5
3	Murach's beginning Java with Net Beans	Joel Murach , Michael Urban	SPD	1	1-3
4	Core Java, Volume I: Fundamentals	Hortsman	Pearson	9	1-3
5	Core Java, Volume II: Advanced Features	Gary Cornell and Hortsman	Pearson	8	4-5
6	Core Java: An Integrated Approach R.	Nageswara Rao	DreamTech	1	1-4

4.b List of Reference Books (R – Symbol for Reference Books) to be Referred by Students

Sr. No	Reference Book Titles	Author/s	Publisher	Edition	Module Nos.
1	Objects First With Java - A Practical Introduction Using BlueJ	David J. Barnes & Michael Kölling.	Pearsons	6	1-4
2	Programming With Java:A Primer 3E	Balagurusamy	McGraw Hill	5	1-4
3	Schaum's Outline of Theory and Problems of Programming with Java	John Rast Hubbard	McGraw Hill	2016	3-5
4	Learning Java: A Bestselling Hands-On Java Tutorial	Patrick Niemeyer, DanielLeuck	O'Reilly	2013	5

4.c List of E - Books (E – Symbol for E-Books) to be Referred by Students

Sr. No	E- Book Titles	Author/s	Publisher	Edition	Module Nos.
1	The Java® Language Specification https://docs.oracle.com/javase/specs/jls/se8/jls8.pdf	James Gosling Bill Joy Guy Steele Gilad Bracha Alex Buckley	Oracle	2015	1-4
2	Think Java How to Think Like a Computer Scientist http://greenteapress.com/thinkapjava/thinkapjava.pdf	Allen B. Downey	-	5.1.2	1-3
3	Introducing Java 8: A Quick-Start Guide to Lambdas and Streams http://www.oreilly.com/programming/free/files/introducing-java-8.pdf	Raoul-Gabriel Urma	O'Reilly	-	4

4.d Reading latest / top rated research papers (at least 5 papers)

Name of Paper	Name of Authors (Background)	Published in		Problem Statement
		Date	Journal	
The Effects of Objects-First and Objects-Late Methods on Achievements of OOP Learners	Murat Pasa Uysal, Department of MIS and Decision Sciences, Rochester, USA	September 29, 2012	Journal of Software Engineering and Applications	Write a java program to create class of employees which get and displays employee details with the help of object and method concept.
Research Paper on Java Interactional Development Environment Programming Tool	B.A. Jadhawar, Komal A. Bhosale, Professor, Computer Science & Engg, DACOE, Karad, India	January 2017	International Advanced Research Journal in Science, Engineering and Technology	Explore IntelliJ IDE - Compare this IDE with other IDEs mentioned in the paper. List down few unique features of IntelliJ IDE
Research on Application Value of Computer Software Development in Java Programming Language	Yangyang Jiang, Xi'an Medical University, China	2020	Journal of Physics: Conference Series	Develop a Mini Project
A Comparative Study of C, C++, C# and Java		2019	Journal of Scientific and Engineering	Differentiate between C, C++, C# and Java language from the paper.

Programming Languages: Underpinning Structure Equation Modeling, Data Structures and Algorithm	Sanja Michael Mutongwa, School of Postgraduate, Depart of Information Technology, University of Kigali, Rwanda Silvance Abeka, Informatics and Innovative Systems, University of Science & Technology (JOOUST), Bondo, Kenya		Research, 2019	
Performance Evaluation of Java Programming Strategies	Qusay Idrees Sarhan, Department of Computer Science, College of Science, University of Duhok, Duhok, Kurdistan Region, Iraq	2021	Academic Journal of Nawroz University (AJNU), Vol.10, No.4, 2021	Optimize the given code so that it requires less time for execution.

4.e **Based on research paper an identify the current Problem statement**

Problem Statement			Used in				
	Quiz	Assignment	Lab	Mini Project	Poster Presentation	Test	Any Other
Write a java program to create class of employees which get and displays employee details with the help of object and method concept.		Y	Y				
Explore IntelliJ IDE - Compare this IDE		Y				Y	

with other IDEs mentioned in the paper. List down few unique features of IntelliJ IDE							
Develop a Mini Project		Y		Y			
Differentiate between C, C++, C# and Java language from the paper.							True or False
Optimize the given code so that it requires less time for execution.		Y	Y				

4.f **Identify Companies / Industries which use the knowledge of the subject and thus may provide Internships and final Placements**

Name of the Company	To be / Contacted for		
	Student Internship	Student Final Placement	Faculty Internship
Shobhit Patodi	✓		

4.g **Identify suitable relevant TOP Guest Speakers from Industry**
(CS50 Lecture by Mark Zuckerberg - 7 December 2005 - YouTube)

Name of the Identified Guest Speaker	Designation	Name of the Company
Andrea Hirsch	Senior Executive Recruiter	Silver Search

4.h **Identify relevant Technical competitions to participate [Competitions -Paper Presentations, Projects, Hackathons, IVs etc..]**

Name of the Relevant Technical Competition Identified to participate	Organized by	Date of the Event
V – Search	VSIT	February 2023
Poster Presentation	VSIT	Yet to be decided

4.i **Identify faculty in TOP schools / Universities who are teaching same / similar subject and develop rapport e.g. Exchange Lecture Material (Assignments / Tests / Project etc..), Joint Paper Publication**

University	Name of the Course	Name of Faculty	Type of Collaboration		
			Exchange of Lecture Material	Joint Publication/ Research	Other
NM College	Core Java	Mr. Prashant Jadhav	Yes	-	-

4.j **Module Best Available in - Title best resource [from *4.a* to *4.d* in this AAP] & give details**

Module No.	Title of the Module	Web Link	Mention the Tile			
			Journal	E-Journal	Magazine	Other Resource
1	Introduction & Data Types	https://www.youtube.com/watch?v=mAtkPQO1FcA What is Java Programming?				Java The Complete Reference Ch 1 – 4
2	Control Flow Statements, Iterations and Classes	https://docs.oracle.com/javase/tutorial/java/nutsandbolts/flow.html				Java The Complete Reference Ch 5 -7 EBalagurusamy Ch 5-8
3	Inheritance & Packages	https://codingcompiler.com/packages/	https://www.journaldev.com/			Java The Complete Reference Ch 8 – 9
4	Enumerations, Arrays, Multithreading, Exceptions & Byte Streams	https://www.tutorialspoint.com/java/java_multithreading.htm	https://www.javadevjournal.com/			Java The Complete Reference Ch 10,11,15,17
5	GUI & Event Handling	https://www.studytonight.com/java/java-awt.php			Java Magazine - Oracle Blogs https://blogs.oracle.com/javamagazine/	Java The Complete Reference Ch 20-22

4.k **Referred to any top-rated university in that subject for content**

University	Name of the Course	Name of Faculty	Date of Delivery of the Course	Remarks
IIT Kharagpur	Programming in Java	Dr. Debasis Samanta	Jan – April 2019	https://nptel.ac.in/courses/106105191

4.l **Faculty received any certification related to this subject. List of Certifications Identified / Done**

Course	Certifying Agency	No. of Hours	Level of the Course		Certification		Remarks
			Introductory	Advance Skill Development	Done on	Proposed to be on	

4.m **Completed subject wise/cluster wise training with cluster mentor.**

[redacted] List of relevant Refresher Course Identified / Done

Course	Certifying Agency (As suggested by DAB/Cluster Mentor/Industry/ University other than MU)	Certification		Remarks
		Done on	Proposed to be on	
Pedagogy				
PBL				
Sub. Content Training				

4.n Best Practices Identified and adopted

No.	Item	Best Practices Identified		
		Univ. 1 – IIT Mumbai	Univ. 2 – AMU	Univ. 3 – Stanford University
1	Microsite			
2	Video Lectures	✓		
3	Assignments			
4	Mini Project			
5	Assessment Metric			
6	Quizzes	✓		
7	Labs/ Practical (PBL)	✓	✓	✓
8	Tests			
9	Peer Assessment			
10	Any Other			

4.o Web Links for Online Notes/YouTube/VSIT Digital Content/VSIT Lecture Capture/NPTEL Videos

Students can view lectures by VSIT professors, captured through LMS 'Lecture Capture' in VSIT campus for previous years.

No.	Websites / Links	Module Nos.
1	Digital Content (live.vsit.edu.in/vrefer)	1-5
2	Online Notes and PPTs (http://www.buyya.com/254/lecture-plan.html)	1-5
3	What is Java Programming? https://www.youtube.com/watch?v=mAtkPQO1FcA	1
4	Difference between JDK, JRE, JVM https://www.youtube.com/watch?v=7tndaxgk1E8	1
5	Executing a program https://www.youtube.com/watch?v=5u8rFbpdvds	1
6	Class Method & Object https://www.youtube.com/watch?v=pKWRin7P4yk	2

7	Garbage Collection https://www.youtube.com/watch?v=Dg9raTR8Sts	2
8	Interface in Java https://www.youtube.com/watch?v=lbVmrWqY-VA	3
9	Java Packages https://www.youtube.com/watch?v=xd_pRY_SYKg	3
10	Java I/O https://www.youtube.com/results?search_query=java+file+handling	4
11	Exception Handling in Java https://www.youtube.com/watch?v=ohpCMpderow	4
12	Swing Introduction : Features, Architecture, JFC https://www.youtube.com/watch?v=7gLw7lGSALA	4
13	What are APIs? https://www.youtube.com/watch?v=OVvTv9Hy91Q	5
14	Event Handling https://www.youtube.com/watch?v=UaenPz_ERVU	5
15	Introduction to JDBC https://www.youtube.com/watch?v=E42I1On0pNo	5

4.p Recommended MOOC Courses like Coursera / NPTEL / MIT-OCW / edX/VAC etc.

Sr. No.	MOOC Course Link	Course conducted by – Person / University / Institute / Industry	Course Duration	Certificate (Y / N)
1.	Programming in Java (43 videos) https://spoken-tutorial.org/tutorial-search/?search_foss=Java&search_language=English	Spoken Tutorial IIT Bombay	12 weeks	Y
2.	Programming in Java https://onlinecourses.nptel.ac.in/noc22_cs47/preview	Swayam NPTEL	12 weeks	Y

5 Consolidated Course Lesson Plan

	From (date/month/year)	From (date/month/year)	Total Number of Weeks
Semester Duration	28/11/2023		13

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
1	1	**Unit I**	Induction				
	2	1	History, features of Java, Java Development Kit		1		J2CR – Ch 01
	3	1	Java Application Programming Interface, Java Virtual Machine		1		J2CR – Ch 01
	4	1	Java Program structure		2		J2CR – Ch 02
2	5	1	Simple Java Programs		2		J2CR – Ch 02
	6	1	The Class Object and Its Attributes, Class Methods, Accessing A Method, Instantiating Objects from A Class		3		J2CR – Ch 06
	7	1	Method Overloading and Constructors		3		J2CR – Ch 07
	8	1	this keyword, super keyword, constants		3		J2CR – Ch 07
3	9	1	Types of Classes, Scope Rules, Access Modifier		3		J2CR – Ch 07
	10	1	static members of a class, garbage collection		3		J2CR – Ch 07
	11	1	Viva/ Question Solving on Unit I		1,2,3		

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
	12	1	Programming Assignment		2,3		
4	SS	1	Operators and data types		2		J2CR – Ch 03,04
	SS	1	Control Flow Statements		2		J2CR – Ch 05
	13	**UNIT II**	Inheritance: Derived Class Objects, Inheritance and Access Control		2,3		J2CR – Ch 08
	14	2	Default Base Class Constructors, this and super keywords		2,3		J2CR – Ch 08
	15	2	Abstract Classes, Abstract Methods		2,3		J2CR – Ch 08
	16	2	Interfaces: What Is an Interface? How Is an Interface Different from An Abstract Class? Multiple Inheritance		2,3		J2CR – Ch 09
5	17	2	Defining an Interface, Implementing Interfaces.		2,3		J2CR – Ch 09
	SS	2	Multilevel, Hierarchical and Hybrid Inheritance		2,3		J2CR – Ch 09
	18	2	Written Assignment Unit 1 & 2		2,3		
	19	2	Class Test		1. 2,3		
	20	**Unit III**	**Packages:** Introduction to predefined packages, User Defined Packages,		3		J2CR – Ch 09
6	21	3	Access specifier, Java Built-in packages		3		J2CR – Ch 09

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
	22	3	Array Class		3		J2CR – Ch 07
	SS	3	String Class		3		J2CR – Ch 17
	23	3	OBT		3		
	24	**Unit IV**	Introduction to JFC and Swing- Features of the Java Foundation Classes Mini Project Discussion and Allocation		4		J2CR – Ch 31
7	25	4	Swing API Components, JComponent Class, Containers and Panels		4		J2CR – Ch 31
	26	4	Labels, Buttons,		4		J2CR – Ch 32
	27	4	Text-Entry Components, Radio Button		4		J2CR – Ch 32
	28	4	Check Boxes, Menus		4		J2CR – Ch 33
8	29	4	Layouts: Flow Layout, Border Layout		4		J2CR – Ch 26
	30	4	Event Handling: Delegation Event Model, Events, Event classes, Event listener interfaces, Using delegation event model		5		J2CR – Ch 14
	31	4	Using delegation event model		5		J2CR – Ch 14
	32	4	Program on Event Handling		5		J2CR – Ch 14
9	33	4	Program on Event Handling and Mini Project Review		5		J2CR – Ch 14

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
	34	4	Mini Project Review		3,4,5		
	SS	4	Grid Layout		4		**J2CR – Ch 26**
	35	**Unit V**	Advanced Swing Controls: Lists and Combo Boxes		4		**J2CR – Ch 32**
	36	5	Colors and File Choosers		4		**J2CR – Ch 32**
10	37	5	Tables and Trees		4		**J2CR – Ch 32**
	38	5	JTabbedPane and JScrollPane		4		**J2CR – Ch 32**
	39	**Unit III**	**Exceptions:** Catching Java Exceptions, Catching Run-Time Exceptions, The finally Clause		2		**J2CR – Ch 10**
	40	3	Handling Multiple Exceptions, Built-in Exceptions in java		2		**J2CR – Ch 10**
11	41	3	The throws Clause, User defined Exceptions		2		**J2CR – Ch 10**
	42	3	Programming Quiz on Exception Handling		2		
	43	**Unit V**	**JDBC:** Introduction, JDBC Architecture		5		Beginning Java with Netbeans – Ch 20
	44	5	JDBC Drivers		5		Beginning Java with Netbeans – Ch 20

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
12	45	5	java.sql package, Using Statement		5		Beginning Java with Netbeans – Ch 20
	46	5	ResultSet		5		Beginning Java with Netbeans – Ch 20
	47	5	Prepared Statement, Callable Statement		5		Beginning Java with Netbeans – Ch 20
	48	5	Mini Project Submission		5		
13	49	**Unit 3**	**Multithreading:** Thread Creations, Thread Life Cycle, Life Cycle Methods		3		**J2CR – Ch 11**
	50	3	Synchronization, wait() notify() notify all() methods		3		**J2CR – Ch 11**

6 Rubric for Grading and Marking of Term Work (inform students at the beginning of semester)

Lecture + Practical (% of class participation) & Marks	Assign-ments	Tutorial	Lab / Practical Performance	Lab Journal Assessment	Class Tests (Other than IA)	Other (1) specify	Other (2) specify	Total
75% Attendance, Active Participation – 10 Marks	1	-	-	-	-	IA 1 (Descriptive) - 20 Marks, IA 2 (MCQs) – 30 Marks Scaled to 15 Marks	-	75

7 Assignments / Tutorials Details

Assignment/ Tutorial No.	Title of the Assignments / Tutorials	CO Map	Assignment/ Tutorials given to Students on	Week of Submission
1	Java Architecture, Class, Methods, Inheritance	1,2,3	5th Week	6h Week

Analysis of Assignment / Tutorial Questions and Related Resources

Assignment / Tutorial No.	Week No.	Type* (√)			Module No.	Based on #			Question Type (√)	
		R	PQ	OBT		Text Book	Reference Book	Other Learning Resource	MU EQ	Thought Provoking
1	5	✓			1,2	4a(2)	4b(2)		✓	✓

* Tick (√) the Type of the Assignment: Regular (R); Pop Quiz (PQ) ; Open Book Test for TE/BE/ME (OBT)
# Write number for text book, reference book, other learning resource from this AAP – *from Points 4.a to 4.d*

8 Internal Assessment / Other Class Test / Open Book Test (OBT)/Take Home Test (THT) Details

Tests	Test Dates	Module No.	CO Map	IA Question Paper Pattern	Policy
1st IA Test	8th week	1,2,3	1,2,3	IA 1 (Descriptive 20M) (Scaled to 15) IA 2 (MCQ 30 M) (Scaled to 7.5)	No IA Re-test
2nd IA Test	12th week	3,4	3,4		IA is a Head of passing *
Pop Quiz	After each Unit	1-5	1-5	MS Teams	
Open Book Test	6th week	3	1,2,3	MS Teams	
Take Home Test	2nd & 8th Week	1,3	1,3	MS Teams	
Class tests / prelims	5th Week	1,2	1,2,3		
Class tests / prelims					
Any other test/exams					

*** Failures of IA test (IA1+IA2) shall appear for IA test in the next semester. There is no provision for re-test in the same semester.**

9.a Practical Activities

Practical No.	Module No.	Title of the **Experiments**	Type of Experiment		

			PBL	Newly Added	Topics to be highlighted	CO Map
1	1	**OOPs concepts in Java – 1** a. Write a program to create a class and implement a default, overloaded and copy Constructor. b. Write a program to create a class and implement the concepts of Method Overloading c. Write a program to create a class and implement the concepts of Static methods			Method, constructor, static embers	2,3
2	2	**OOPs concepts in Java – 2** a. Write a program to implement the concepts of Inheritance and Method overriding b. Write a program to implement the concepts of Abstract classes and methods c. Write a program to implement the concept of interfaces			Inheritance, Interfaces, Abstract Class & Methods	2,3
3	3	**Exceptions** a. Write a program to raise built-in exceptions and raise them as per the requirements b. Write a program to define user defined exceptions and raise them as per the requirements			Exception Handling	2
4	3	**Multithreading:** Write a java application to demonstrate 5 bouncing balls of different colors using threads.			Multithreading	2
5	4,5	**JDBC** a. Write a JDBC program that displays the data of a given table in a GUI Table. b. Write a JDBC program to Show the details of a specified product from a given table selected using Combobox. c. Write a GUI application to Navigate forward and reverse result set data.			Swing Components and Database Connectivity	4,5
6	5	**Swing** a. Create a swing application that randomly changes color on button click.			Swing Advanced Components	4,5

		b. Create a Swing application to demonstrate use of TextArea using scrollpane to show contest of text file in textarea selected using file chooser. c. Create a Swing application to demonstrate use of scrollpane to change its color selected using colour chooser.				
7	4	**Layouts: Write programs for the following layouts** a. Flow Layout b. Grid Layout c. Border Layout			Layouts	4
8	4	**Events: Write programs to demonstrate the following events:** a. ActionEvent b. MouseEvent c. KeyEvent d. SelectionEvent e. FocusEvent			Event Handling	4,5
9	4	Demonstrate the use of Adapter Class in Event Handling			Adapter Class	4,5
10	2	Implementing Functional Interface using Lambda Expression		✓	Lambda Expression	
11	All Units	Mini Project	✓			

10 Beyond Syllabus Activities for Gap Mitigation

No.	Type of the Activity	Activities	Number of beneficiaries	Other Details – guest profile, feedback, mark sheet, report
1	**Experiential learning/Interaction with Outside World**	1- Guest Lectures by Industry Expert		
		2- Workshops		
		3- Mini Project	50	
		4- Industrial Visit		
		5- Any other activity		
2		6- Poster Presentation	50	

	Collaborative & Group Activity	7- Minute Papers	All Students	
		8- Students Seminars		
		9- Students Debates		
		10- Panel Discussion / Mock GD		
		11- Mock Interview		
		12- Any other activity		
3	**Co-Curricular Activity**	13- Informative videos (NPTEL/Youtube /TEDx/ MIT OW/edX)	100	
		14- Lecture Capture Usage		
		15- Any other activity		
4	**Tests & Assessments**	16- Class Tests/ Weekly Tests	All Students	
		17- Pop Quiz	All Students	
		18- Mobile App Based Quiz		
		19- Open Book Test	All Students	
		20- Take Home Test	All Students	
		21- Any other activity		

11.1 One-on-One Academic Mentoring Meetings done

No.	Name of Mentee	Date of One-On-One Meeting		
		Beginning of Sem.	After Mid Term Results	Before End Sem.

11.2 Identify concerns and refer appropriately

No.	Name of Mentee	Action Taken

		Individual Goals Identified	Any Financial Concern which needs to be referred to	Any Emotional Concern to be referred to

*** Do not delete any activity. Give details for planned events. Write 'NA' for activity Not Planned.**

Consolidated Academic Administration Plan Prepared by (mention all theory teaching faculty names with signature)

Please write below your name and sign with date of the external cluster mentor meeting

Ms. Seema Murkar	Ms. Ketaki Ghawali

External Industry Mentor	External Academic Mentor	VSIT Cluster Mentor	Program HOD

VSIT Vidyalankar School of Information Technology **Version 05/22-8**	**Consolidated Academic Administration Plan for the Course** ***USIT 403 Computer Oriented Statistical Techniques*** ***Sem. IV – Program B.Sc. IT 2023-24 – Even Semester*** ***Faculty - Prof. Vaishali Deshmukh , Prof. Priya Ramchandran & Prof.Pooja Soni***

The academic resources available in VSIT –

VMIS (ERP)	V-Refer and V-Live	VSIT Library	VAC & MOOC Courses
Institute & Department Vision and Mission	Former IA question papers and solutions (prepared by faculty)	Former IA question papers solutions - hardcopy	Value Added Courses (VAC) are conducted throughout the semester & in the semester break - Enrol for the VACs
Program Educational Objectives (PEO)	MU end semester examination question papers and solutions (prepared by faculty)	MU end semester exam question paper & solutions - by faculty, hardcopy	
Program Specific Outcome (PSO)	Class notes and Digital Content for the subject (scanned / typed by faculty)	All text books, reference books, e - books mentioned in the syllabus & AAP	Online courses from NPTEL, Coursera etc. are pursued throughout the semester - Register for the course & get certified
Program Outcome (PO)	Comprehensive question bank, EQ, GQ, PPT, Class Test papers	Technical journals and magazines for reference	
Departmental Knowledge Map	Academic Administration Plan & Beyond Syllabus Activity report	VSIT library is member of IIT Bombay Library	Watch former lectures captured in LMS at VSIT

1.a **Course Objectives (Write in detail – as per NBA guidelines)**

Cognitive	What do you want students to know?	To understand the fundamental statistical concepts and some of their applications in science and society.
Affective	What do you want students to think / care about?	To develop the thinking ability about the quantitative information we encounter every day.
Behavioural	What do you want students to be able to do?	To correctly identify the appropriate statistical techniques that is used to solve the given problem.

Advice to Students:

Attend every class!!! Missing even one class can have a substantial effect on your ability to understand the course. Be prepared to think and concentrate, in the class and outside. I will try to make the class very interactive. Participate in the class discussions. Ask questions when you don't understand something. Keep up with the class readings. Start assignments and homework early. Meet me in office hour to discuss ideas, solutions or to check if what you understand is correct.

Collaboration Policy:

We encourage discussion between students regarding the course material. However, no discussion of any sort is allowed with anyone on the assignment and homework for the class. If you find solution to some problems in a book or on the internet, you may use their idea for the solution; provided you acknowledge the source (name and page in the book or the website, if the idea is found on the internet). Even though you are allowed to use ideas from another source, you must write the solution in your own words. If you are unsure whether or not certain kinds of collaboration is possible, please ask the teacher.

1.b **Course Outcome (CO) Statements and Module-Wise Mapping (follow NBA guideline)**

CO No.	Statements	Related Module/s
CO1	To understand & summarize the information present in the given data set that gives an idea around which value the data observation is clustered.	1
CO2	To develop the complementary relationship of skewness and moments with measures of central tendency and dispersion in describing a set of data.	2
CO3	To design information about a population from samples drawn from it. And also to make decisions about populations on the basis of sample information.	3
CO4	To determine whether the difference between the observed and expected values is statistically significant.	4
CO5	To identify the strength and direction of a linear relationship between two variables using correlation and to predict how much a dependent-variable changes based on adjustments to an independent variable using regression.	5

1.c **Mapping of COs with POs (mark S: Strong, M: Moderate, W: Weak, Dash '–': not mapped)**

(List of POs is available in V-refer)

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

1.d **Mapping of COs with PSOs (mark S: Strong, M: Moderate, W: Weak, Dash '–':not mapped)**

	PSO 1	PSO 2	PSO 3	PSO 4
CO 1				
CO 2				
CO 3				
CO 4				
CO 5				

1.e **Teaching and Examination Scheme (As specified by the University) for the Course**

Categories	Humanities and Social Sciences	Basic Science	Engineering Science	Professional Core	General Education	Professional Elective	Project/ Internship	Open Elective
Tick suitable category			√					

Subject Code	Subject Name	Teaching Scheme			Credits Assigned			
		Theory	Practical	Tutorial	Theory	TW/Practical	Tutorial	Total
USIT 403	Computer oriented statistical techniques	75	-	-	2	-	-	4
USIT 4P3	Computer oriented statistical techniques	-	50	-	-	2	-	

Subject Code	Subject Name	Examination Scheme							
		Theory Marks IA Test			End Sem. Exam Marks	TW	Practical	Oral	Total
		IA 1	IA 2	Average of IA1 and IA2					
USIT 403	Computer oriented statistical techniques	30 (Scaled to 15)	-	15	75	15+10=25 (Assignment + Test)	-	-	150
USIT 4P3	Computer oriented statistical techniques						50		

1.f **Faculty-Wise Distribution of all Lecture-Practical-Tutorial Hours for the Course**

Divisions	Lecture (Hrs.)	Practical (Hrs.)				Tutorial (Hrs.)			
		Batch 1	Batch 2	Batch 3	Batch 4	Batch 1	Batch 2	Batch 3	Batch 4
Div A	4	2	2	NA	NA	NA	NA	NA	NA
Div B	4	2	2	NA	NA	NA	NA	NA	NA
Div C	4	2	2	NA	NA	NA	NA	NA	NA
Div D	4	2	2	NA	NA	NA	NA	NA	NA
Div E	4	2	2	NA	NA	NA	NA	NA	NA
Div F	4	2	2	NA	NA	NA	NA	NA	NA

1.g **Office Hours (Faculty will be available in office in this duration for solving students' query)**

Division	Day	Time (at least 1 Hr. / Division)	Venue (Office Room No.)
Div A	Monday	9:30-10:00 AM	VSIT Staff room
Div B	Monday	9:30-10:00 AM	VSIT Staff room
Div C	Monday	9:30-10:00 AM	VSIT Staff room

Div D	Monday	9:30-10:00 AM	VSIT Staff room
Div E	Monday	9:30-10:00 AM	VSIT Staff room
Div F	Monday	9:30-10:00 AM	VSIT Staff room

2.a **Syllabus : Module Wise Teaching Hours and % Weightage in University Question Paper**

Module No.	Module Title and Brief Details	Teaching Hrs. for each module	% Weightage in University Question Papers
1	Measures of central tendency and measures of dispersion	10	20
2	Moments, Skewness & kurtosis, Elementary probability theory, Elementary sampling theory	12	20
3	Statistical estimation theory, Statistical decision theory, Statistics in R	8	20
4	Small sampling theory, The Chi-Square test	12	20
5	Curve fitting and correlation theory	8	20
	* Insert rows for more modules in the Course **Total**	**50**	**100**

2.b **Prerequisite Courses**

No.	Semester	Name of the Course	Topic/s
1	B.Sc.IT Sem I	Discrete Mathematics	Counting and Probability
2	B.Sc.IT Sem II	Numerical & statistical methods	Least square regression, random variables & distributions
3	FY, SY JC	Mathematics & Statistics	Permutation, combinations, Binomial theorem, probability distribution, Bernoulli trials

2.c **Relevance to Future Courses**

No.	Semester	Name of the Course
1	B.Sc.IT Sem V	Artificial Intelligence
2	B.Sc.IT Sem VI	Business Intelligence
3	M.Sc.IT Sem I	Data Science
4	M.Sc.IT Sem II	Machine Learning

5	-	Research

2.d **Identify real life scenarios/examples which uses the knowledge of the subject (Discussion on how to prepare examples and case studies e.g. "Boeing Plane": C Programming Language – Intro to Computer Science – Harvard's CS50 (2018) – Bing video)**

Real Life Scenario	Concept Used
Stock analysts use statistical computer models to forecast what is happening in the economy.	Regression Analysis
Companies use sampling technique for Quality testing of the products.	Theory of Sampling
Statistics of sports player make the match or game more interesting and provide ground for fans to argue about the dominance of their favourite player in the game.	Game Theory
Weather forecasting is done which uses statistics that compare prior weather conditions with current weather.	Regression Analysis
In entertainment to predict TRP of television channel.	Correlation and Regression Analysis
Scientists use statistics to validate rate of effectiveness before any drug can be prescribed. Statistics are behind every medical study you hear about.	Testing of Hypothesis

3 **Past Results – Division-Wise**

Details	Target – Apr 2024	Apr 2023	Apr 2022	Apr 2021
Course Passing % – Average of 2 Divisions	100	100	100	100
Marks Obtained by Course Topper (mark/100)	100	100	92	93

	Div A		Div B		Div C		Div D		Div F	
Year	Initials of Teacher	% Result	Initials of Teacher	% Result	Initials of Teacher	% Result	Initials of Teacher	% Result	Initials of Teacher	% Result
Apr 2023	VD	100	VD	91.07	VD	88.89	GS	91.23	GS	96.61
Apr 2022	GS	100	GS	100	GS	100	GS	100	GS	100
Apr 2021	MJ/GS	100	MJ/GS	100	MJ/GS	100	MJ/GS	100	MJ/GS	100

4 **All the Learning Resources – Books and E-Resources**

4.a **List of Text Books (T – Symbol for Text Books) to be Referred by Students**

Sr. No	Text Book Titles	Author/s	Publisher	Edition	Module Nos.
1	Statistics	Murray R. Spiegel, Larry J. Stephens	McGRAW-HILL international	4th	All units

4.b **List of Reference Books (R – Symbol for Reference Books) to be Referred by Students**

Sr. No	Reference Book Titles	Author/s	Publisher	Edition	Module Nos.
1	Fundamental of mathematical statistics	S.C.Gupta & V.K.Kapoor	Sultan Chand and sons	11th	All units
2	Mathematical Statistics	J.N.Kapur and H.C.Saxena	S. Chand	12th	All units
3	A Practical approach using R	R.B.Patil, H.J.Dand and R.Bhavsar	SPD	1st	Practical

4.c **List of E - Books (E – Symbol for E-Books) to be Referred by Students**

Sr. No	E- Book Titles	Author/s	Publisher	Edition	Module Nos.
1	Statistics	Murray R. Spiegel, Larry J. Stephens	McGRAW-HILL international	4th	All units
2	Mathematical & Statistical anxiety https://www.doabooks.org	Kinga morsanyi	Frontiers media SA	1st	All

4.d **Reading latest / top rated research papers (at least 5 papers)**

Name of Paper	Name of Authors (Background)	Published in		Problem Statement
		Date	Journal	
Statistical analysis of Covid-19 mortality rate via probability distributions	Muhammad Farooq, Muhammad Ijaz, Muhammad Atif, Tahani Abushal, Mahmoud El-Morshedy	27 October 2022	PLOS ONE https://doi.org/10.1371/journal.pone.0274133	Modelling of Covid-19 mortality rate via probability distributions
Risk Factors of Recurrent Stroke in Young and Middle-Aged Stroke Patients after Interventional Therapy	Xin Dai, Fang Wang, Haiyang Lv, and Xiuling Cheng	25 April 2022	Hindawi Computational and Mathematical Methods in Medicine	To explore the risk factors of recurrent stroke in young and middle-aged stroke patients after interventional therapy
Heart Disease Prediction using Exploratory Data Analysis	R.Indrakumari, T. Poongodi, Soumya Ranjan Jena	June 2020	Procedia Computer Science 173 (2020) 130–139, ScienceDirect, Elsevier	To predict the heart disease, K-means clustering algorithm is used along with data analytics and visualization tool.
Illustration of Linear Regression Analysis	Bernd Skiera, Jochen Reiner, and Sönke Albers	September 2018	C. Homburg et al. (eds), Handbook of Market Research, Springer International Publishing AG 2018	Illustrate the basic idea of linear regression analysis by applying it to data from a company

Feature Analysis of Coronary Artery Heart Disease Data Sets	Randa El-Bialy, Mostafa A. Salamay, Omar H. Karam and M.Essam Khalifa	September 2015	Procedia Computer Science 65 (2015) 459 – 468, ScienceDirect, Elsevier	To apply an integration of the results of the machine learning analysis on different data sets targeting the CAD disease.

4.e **Based on research paper an identify the current Problem statement**

Problem Statement			Used in				
	Quiz	Assignment	Lab	Mini Project	Poster Presentation	Test	Any Other
Statistical Analysis of Blood Pressure with respect to Some Demographic factors	Yes	Yes				Yes	

4.f **Identify Companies / Industries which use the knowledge of the subject and thus may provide Internships and final Placements**

Name of the Company	To be / Contacted for		
	Student Internship	Student Final Placement	Faculty Internship
Ugam Solution	Yes	Yes	-
Magic 9	Yes	Yes	-

4.g **Identify suitable relevant TOP Guest Speakers from Industry**
(CS50 Lecture by Mark Zuckerberg - 7 December 2005 - YouTube)

Name of the Identified Guest Speaker	Designation	Name of the Company
Mr. Madhav Mishra	DATA SCIENTIST	@ TELSTRA | EX- PRODUCT MANAGER @ RELIANCE JIO

4.h **Identify relevant Technical competitions to participate [Competitions -Paper Presentations, Projects, Hackathons, IVs etc..]**

Name of the Relevant Technical Competition Identified to participate	Organized by	Date of the Event
Paper Presentations	Vsearch-National Level Students Research Conference by VSIT	Jan / Feb
Poster Presentation	VSIT	To be decided

4.i **Identify faculty in TOP schools / Universities who are teaching same / similar subject and develop rapport e.g. Exchange Lecture Material (Assignments / Tests / Project etc..), Joint Paper Publication**

University	Name of the Course	Name of Faculty	Type of Collaboration		
			Exchange of Lecture Material	Joint Publication/ Research	Other
Gandhi Institute of Engg. Technology, Gunupur, Odisha	IT	Dr.Kali Charan Rath	√	-	-

4.j **Module Best Available in - Title best resource [from *4.a* to *4.d* in this AAP] & give details**

Module No.	Title of the Module	Web Link	Mention the Tile			
			Journal	E-Journal	Magazine	Other Resource
1	Measures of central tendency and measures of dispersion	https://iosrjournals.org/iosr-jm/papers/Vol6-issue1/A0610104.pdf?id=4129 https://link.springer.com/book/10.1007/978-1-349-14777-9	√		√	
2	Moments, Skewness & kurtosis, Elementary probability theory, Elementary sampling theory	https://www.atlantis-press.com/journals/jsta/125957123/view https://www.doabooks.org		√		√
3	Statistical estimation theory, Statistical decision theory, Statistics in R	https://link.springer.com/referenceworkentry/10.1057/978-1-349-95189-5_1872 https://www.sciencedirect.com/book/9780123075604/statistical-decision-theory-and-related-topics	√		√	
4	Small sampling theory, The Chi-Square test	https://www.researchgate.net/publication/258124458_The_Chi-Square_Test_Often_Used_and_More_Often_Misinterpreted		√		
5	Curve fitting and correlation theory	https://www.researchgate.net/topic/Curve-fitting/publications https://www.sciencedirect.com/topics/mathematics/chi-square-testing	√		√	

4.k **Referred to any top-rated university in that subject for content**

University	Name of the Course	Name of Faculty	Date of Delivery of the Course	Remarks
IIT Kanpur, NIT Sikkim	Descriptive Statistics With R Software	Prof. Shalabh, Prof. Prashant Jha	2023	NPTEL SWAYAM

4.l **Faculty received any certification related to this subject. List of Certifications Identified / Done**

Course	Certifying Agency	No. of Hours	Level of the Course	Certification	Remarks

			Introductory	Advance Skill Development	Done on	Proposed to be on	
Introduction to R Programming	Spoken Tutorial IIT Bombay	15	√	-	-	-	-

4.m **Completed subject wise/cluster wise training with cluster mentor.**
List of relevant Refresher Course Identified / Done

Course	Certifying Agency (As suggested by DAB/Cluster Mentor/Industry/University other than MU)	Certification		Remarks
		Done on	Proposed to be on	
Pedagogy				
PBL				
Sub. Content Training				

4.n **Best Practices Identified and adopted**

No.	Item	Best Practices Identified		
		Univ. 1	Univ. 2	Univ. 3
1	Microsite	-		
2	Video Lectures	-		
3	Assignments	Yes		
4	Mini Project	-		
5	Assessment Metric	-		
6	Quizzes	Yes		
7	Labs/ Practical (PBL)	Yes		
8	Tests	Yes		
9	Peer Assessment	-		
10	Any Other	-		

4.o **Web Links for Online Notes/YouTube/VSIT Digital Content/VSIT Lecture Capture/NPTEL Videos**

Students can view lectures by VSIT professors, captured through LMS 'Lecture Capture' in VSIT campus for previous years.

No.	Websites / Links	Module Nos.
1	VSIT Digital content (https://drive.google.com/open?id=1sqTfdhBhFsQrvl1GWUuUdzJBxL0W-lWF)	All units

2	YouTube videos on Probability and Statistics by Khan Academy https://www.youtube.com/watch?v=uhxtUt_-GyM&list=PL1328115D3D8A2566	1,2,4
3	Statistics course NPTEL by Maruf mohd https://www.youtube.com/watch?v=53ONuP3XMnA&index=27&list=PLFP-lMQJonXf0JeQyBPl64gDmcqdF60IR	3
4	Curve fitting and method of least square https://www.youtube.com/watch?v=3hz6Tb1i2FY	5
5	Intro to Hypothesis Testing in Statistics - Hypothesis Testing Statistics Problems & Examples https://www.youtube.com/watch?v=VK-rnA3-41c	4
6	Null and Alternate Hypothesis - Statistical Hypothesis Testing https://www.youtube.com/watch?v=_Qlxt0HmuOo	3
7	Correlation and Regression https://www.youtube.com/watch?v=vvv9DhUrzlY&list=PLLgJVrtHe9RpjsPfPKqlmBKX-lDwohU_H	5
8	Normal distribution https://www.youtube.com/watch?v=NbWrFFCq2Ks	3
9	t-test and chi square test https://www.youtube.com/watch?v=I10q6fjPxJ0	4
10	Statistical Estimation Theory https://www.youtube.com/watch?v=VK-rnA3-41c	3

4.p **Recommended MOOC Courses like Coursera / NPTEL / MIT-OCW / edX/VAC etc.**

Sr. No.	MOOC Course Link	Course conducted by – Person / University / Institute / Industry	Course Duration	Certificate (Y / N)
1	R https://spoken-tutorial.org/tutorial-search/?search_foss=R&search_language=English	Spoken Tutorial, IITB	1 week	Y
2	Statistics for Data analysis using R https://www.udemy.com/statistics-using-r/	Udemy	12.5Hrs	Y(paid)

5 **Consolidated Course Lesson Plan**

	From (date/month/year)	To (date/month/year)	Total Number of Weeks
Semester Duration	28/11/2023		

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
1	1	1	Induction, Mean, Median, Mode of raw data		1		Statistics 3.1/61
	2		Mean, Median, Mode of frequency distribution				Statistics 3.2 to 3.6/62-64

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
	3		Mean, Median, Mode of grouped data Geometric Mean, Harmonic Mean				Statistics 3.7 to 3.8/65-66
	4		Quartile, Deciles & Percentiles				Statistics 3.9/66-68
2	5		Quartile, Deciles & Percentiles				Statistics 4.1/95
	Self-Study		Absolute and Relative Dispersion				Statistics 4.7/100
	6		Dispersion- Range, Mean Deviation, Standard Deviation & Variance				Statistics 4.2/95 to 4.3/96
	7		Dispersion- Standard Deviation & Variance				Statistics 4.5/99
	8		Properties of Standard Deviation & Variance				Statistics 4.5/99
3	Self-Study		Range				Statistics 4.5/99
	9		Semi interquartile Range				Statistics 4.7/100
	10		Measure of Dispersion Relative and Absolute dispersion				Statistics 4.7/100
	11	2	Raw Moments		2		Mathematical Statistics pg 53
	12		Central Moments				Mathematical Statistics pg 55
4	13		Moments for the grouped data				Mathematical Statistics pg 55

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
	14		Skewness				Mathematical Statistics pg 55
	15		Kurtosis				Mathematical Statistics pg 56
	Self-Study		Introduction to Probability				Statistics 6.1
	16		Set theory and Venn Diagram				Statistics 6.5
5	17		Conditional Probability, Random Variables				Statistics 6.5
	18		Dependent and independent Events				Statistics 6.5
	19		Normal, Binomial Distribution				Statistics pg.6.10
	20		Random Numbers and Random Samples				Statistics 6.5
6	21		Sampling with and without replacement				Statistics 6.5
	Self-Study		Expectation				Statistics pg.6.10
	22		Sampling Distribution				Statistics pg.6.10
	23	5	Curve fitting, The method of least square, least square lines		5		Statistics 13.1 to 13.3
	24		Curve Fitting				Statistics 13.4 to 13.5

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
	Self-Study		Freehand method of curve Fitting				Statistics 13.4 to 13.5
7	25		Regression				Statistics 13.6
	26		Linear correlation				Statistics 14.1-14.3
	27		Standard Error of Estimate				Statistics 14.4
	28		Coefficient of correlation				Statistics 13.6
	Self-Study		Straight line equation				Statistics 13.6
8	29		Application to time series				Statistics 13.6
	30		Types of Correlation				Statistics 13.7
	31	3	Sampling Theory of Correlation		3		Statistics 13.6
	32		Sampling Theory of Regression				Statistics 13.6
9	33		Sampling theory				Mathematical statistics pg 440
	Self-Study		Sample and Population				Mathematical statistics pg 444
	34		Types of sampling				Mathematical statistics pg 445

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
	35		Confidence Interval estimates				Mathematical statistics pg 448
	36		Statistical Hypothesis				Statistics pg 9.1
10	37		Two tailed and one tailed tests				Statistics pg 9.1-9.2
	38		Type I and Type II errors, Level of significance				Statistics pg 9.1-9.2
	39		Z score of Mean and proportions				Statistics pg 10.2
	40		Hypothesis Testing				Statistics pg 10.2
11	41		P values for hypothesis testing				Statistics pg 10.3
	42		Students t-distribution				statistics pg 16.1
	Self-Study		Small Samples				statistics pg 16.1
	43	4	Tests of hypotheses and significance		4		Statistics 11.3
	44		The Chi-square distribution				statistics pg 15.1
12	45		Additive Property of Chi-square				statistics pg 15.1
	46		Yates correction for continuity				Fundamentals of mathematical statistics pg 15.36

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
	47		Degree of freedom				Statistics 11.5
	Self-Study		Confidence Intervals				Statistics 11.5
	48		The F distribution				Fundamentals of mathematical statistics pg 16.26
13	49		Observed and theoretical frequencies				Statistics 12.1
	Self-Study		Correlation of Attributes				Statistics 12.1
	50		Goodness of fit, Contingency tables				Fundamentals of mathematical statistics pg 15.26, 15.31

6 Rubric for Grading and Marking of Term Work (inform students at the beginning of semester)

Lecture + Practical (% of class participation) & Marks	Assign-ments	Tutorial	Lab / Practical Performance	Lab Journal Assessment	Class Tests (Other than IA)	Other (1) specify	Other (2) specify	Total
Active Participation (05)	3	-	Practical Submission (100) Scaled down to 20 Pract Assessment #1 – (20 Marks) scaled to 10 Marks Final Pract Exam (Mini-Project presentation + Viva) – 20 Marks		IA 1 - 30 Marks, Scaled to 15 Marks Total 15+10 (Assignment +Test)	25		75

7 Assignments / Tutorials Details

Assignment/ Tutorial No.	Title of the Assignments / Tutorials	CO Map	Assignment/ Tutorials given to Students on	Week of Submission
1	Measures of central tendency, measures of dispersion	1	3rd week	4th week
2	Moments, Skewness, Kurtosis & Probability, and curve Fitting	2	8th week	9th week
3	Statistical decision theory and statistical estimation theory	4	12th week	13th week

Analysis of Assignment / Tutorial Questions and Related Resources

Assignment / Tutorial No.	Week No.	Type* (√)			Module No.	Based on #			Question Type (√)	
		R	PQ	OBT		Text Book	Reference Book	Other Learning Resource	MU EQ	Thought Provoking
1	4		√		1	√				
2	10			√	2	√				
3	15	√			3	√	√			√

* Tick (√) the Type of the Assignment: Regular (R); Pop Quiz (PQ) ; Open Book Test for TE/BE/ME (OBT)

Write number for text book, reference book, other learning resource from this AAP – *from Points 4.a to 4.d*

8 Internal Assessment / Other Class Test / Open Book Test (OBT)/Take Home Test (THT) Details

Tests	Test Dates	Module No.	CO Map	IA Question Paper Pattern	Policy
1st IA Test	Week 6	1,2	1,2	IA 1 (Descriptive)- 30 Marks (Scaled to 20)	No IA Re-test
2nd IA Test	Week 12	3, 5	3, 5		IA is a Head of passing *
Pop Quiz	Week 5	2	2		
Open Book Test	Week 7	5	5		
Take Home Test	Week 10	3	3		

*** Failures of IA test (IA1+IA2) shall appear for IA test in the next semester. There is no provision for re-test in the same semester.**

9.a Practical Activities

Practical No.	Module No.	Title of the **Experiments**	Type of Experiment		Topics to be highlighted	CO Map
			PBL	Newly Added		

1		Using R execute the basic commands, array, list and frames	√		List and Frames	1
2		Create a Matrix using R and Perform the operations addition, inverse, transpose and multiplication operations.	√		Matrix Operations using R Software.	2
3	1	Using R Execute the statistical functions: mean, median, mode, quartiles, range, inter quartile range histogram.	√		Statistical functions and Measure of Dispersion Using R software.	3
4	1	Using R import the data from Excel / .CSV file and Perform the above functions.		√	Data importing in R Software.	3
5	1	Using R import the data from Excel / .CSV file and Calculate the standard deviation, variance, co-variance.	√		Concept of Standard deviation and Variance.	3
6	3,4	Import the data from Excel / .CSV and perform the hypothetical testing, Chi square test.	√		Testing of hypothesis.	4
7	3	Using R perform the binomial and normal distribution on the data	√		Probability Distribution using R Software.	5
8	5	Perform the Linear Regression using R.		√	Regression Analysis.	5

10 Beyond Syllabus Activities for Gap Mitigation

No.	Type of the Activity	Activities	Number of beneficiaries	Other Details – guest profile, feedback, mark sheet, report
1	**Experiential learning/Interaction with Outside World**	1- Guest Lectures by Industry Expert	60-70	Feedback & Report
		2- Workshops	NA	NA
		3- Mini Project	All 300 students	Mark sheet
		4- Industrial Visit	NA	NA
		5- Any other activity	Pop Quiz	Mark sheet
2	**Collaborative & Group Activity**	6- Poster Presentation	50-60	Report
		7- Minute Papers	All 300 students	Mark sheet

		8- Students Seminars	NA	NA
		9- Students Debates	NA	NA
		10- Panel Discussion / Mock GD	NA	NA
		11- Mock Interview	NA	NA
		12- Any other activity		
3	**Co-Curricular Activity**	13- Informative videos (NPTEL/Youtube /TEDx/ MIT OW/edX)	150	R-Spoken Tutorial Statistics for Data analysis using R https://www.udemy.com/statistics-using-r/
		14- Lecture Capture Usage	NA	NA
		15- Any other activity	-	-
4	**Tests & Assessments**	16- Class Tests/ Weekly Tests	Class Test	Feedback or Mark sheet
		17- Pop Quiz	200	Report
		18- Mobile App Based Quiz	150	Report
		19- Open Book Test	200	7th week (module 5)
		20- Take Home Test	200	10th week (module 3)
		21- Any other activity		12th Week- Formulae sheet

11.1 **One-on-One Academic Mentoring Meetings done**

No.	Name of Mentee	Date of One-On-One Meeting		
		Beginning of Sem.	After Mid Term Results	Before End Sem.

11.2 **Identify concerns and refer appropriately**

No.	Name of Mentee	Action Taken		
		Individual Goals Identified	Any Financial Concern which needs to be referred to	Any Emotional Concern to be referred to

*** Do not delete any activity. Give details for planned events. Write 'NA' for activity Not Planned.**

11.1 **One-on-One Academic Mentoring Meetings done**

No.	Name of Mentee	Date of One-On-One Meeting		
		Beginning of Sem.	After Mid Term Results	Before End Sem.

11.2 **Identify concerns and refer appropriately**

No.	Name of Mentee	Action Taken		
		Individual Goals Identified	Any Financial Concern which needs to be referred to	Any Emotional Concern to be referred to

*** Do not delete any activity. Give details for planned events. Write 'NA' for activity Not Planned.**

Consolidated Academic Administration Plan Prepared by (mention all theory teaching faculty names with signature)

Please write below your name and sign with date of the external cluster mentor meeting

Ms. Vaishali Deshmukh	Ms. Priya Ramchandran	Ms.Pooja Soni

External Industry Mentor	External Academic Mentor	VSIT Cluster Mentor	Program HOD

VSIT
Vidyalankar School of Information Technology

Version 05/23-6

Consolidated Academic Administration Plan for the Course

Enterprise Java

Sem. V – Program B.Sc. IT 2023-24 – Odd Semester

Faculty - Ms. Ketaki G.

The academic resources available in VSIT –

VMIS (ERP)	V-Refer and V-Live	VSIT Library	VAC & MOOC Courses
Institute & Department Vision and Mission	Former IA question papers and solutions (prepared by faculty)	Former IA question papers solutions - hardcopy	Value Added Courses (VAC) are conducted throughout the semester & in the semester break - Enrol for the VACs
Program Educational Objectives (PEO)	MU end semester examination question papers and solutions (prepared by faculty)	MU end semester exam question paper & solutions - by faculty, hardcopy	
Program Specific Outcome (PSO)	Class notes and Digital Content for the subject (scanned / typed by faculty)	All text books, reference books, e -books mentioned in the syllabus & AAP	Online courses from NPTEL, Coursera etc. are pursued throughout the semester - Register for the course & get certified
Program Outcome (PO)	Comprehensive question bank, EQ, GQ, PPT, Class Test papers	Technical journals and magazines for reference	
Departmental Knowledge Map	Academic Administration Plan & Beyond Syllabus Activity report	VSIT library is member of IIT Bombay Library	Watch former lectures captured in LMS at VSIT

1.a Course Objectives (Write in detail – as per NBA guidelines)

Cognitive	What do you want students to know?	To know about all basic concepts like client server applications, n- tier architecture, Java EE server, different Java EE containers and services provided by them.
Affective	What do you want students to think / care about?	To understand the fundamentals of creating web applications and how to separate presentation data from business logics and the database and to work with JDBC along with Servlets and JSPs.
Behavioural	What do you want students to be able to do?	To develop a complete web application.

Advice to Students:

Attend every class!!! Missing even one class can have a substantial effect on your ability to understand the course. Be prepared to think and concentrate, in the class and outside. I will try to make the class very interactive. Participate in the class discussions. Ask questions when you don't understand something. Keep up with the class readings. Start assignments and homework early. Meet me in office hour to discuss ideas, solutions or to check if what you understand is correct.

Collaboration Policy:

We encourage discussion between students regarding the course material. However, no discussion of any sort is allowed with anyone on the assignment and homework for the class. If you find solution to some problems in a book or on the internet, you may use their idea for the solution; provided you acknowledge the source (name and page in the book or the website, if the idea is found on the internet). Even though you are allowed to use ideas from another source, you must write the solution in your own words. If you are unsure whether or not certain kinds of collaboration is possible, please ask the teacher.

1.b Course Outcome (CO) Statements and Module-Wise Mapping (follow NBA guideline)

CO No.	Statements	Related Module/s
CO1	To understand the basics of Java EE and Java Servlets and their implementation.	Unit 1
CO2	To build Java Servlet application using RequestDispatcher, Cookies and Sessions. Working with File I/O.	Unit 2
CO3	To develop JSP applications and brief usage of Java Server Page Standard Tag Library	Unit 3
CO4	To implement Enterprise Java Beans and working with Java Naming and Directory Interface.	Unit 4
CO5	To design applications related to ORM, JPA and Hibernate framework.	Unit 5

1.c Mapping of COs with POs (mark S: Strong, M: Moderate, W: Weak, Dash '–': not mapped)

(List of POs is available in V-refer)

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

1.d Mapping of COs with PSOs (mark S: Strong, M: Moderate, W: Weak, Dash '–':not mapped)

	PSO 1	PSO 2	PSO 3	PSO 4
CO 1	M	S	M	
CO 2	M	S	S	
CO 3	M	S	S	
CO 4	W	S	S	
CO 5	S	S	S	

1.e Teaching and Examination Scheme (As specified by the University) for the Course

Categories	Humanities and Social Sciences	Basic Science	Engineering Science	Professional Core	General Education	Professional Elective	Project/ Internship	Open Elective
Tick suitable category				✓				

Subject Code	Subject Name	Teaching Scheme			Credits Assigned			
		Theory	Practical	Tutorial	Theory	TW/Practical	Tutorial	Total
USIT506	Enterprise Java	75	-	-	2	-	-	2
USIT5P6	Enterprise Java Practical	-	50	-	-	2	-	2

Subject Code	Subject Name	Examination Scheme							
		Theory Marks IA Test			End Sem. Exam Marks	TW	Practical	Oral	Total
		IA 1	IA 2	Average of IA1 and IA2					
USIT506	Enterprise Java	30 (Scaled down to 15)	-	15 +10(active participation)	75	25	-	-	100
USIT5P6	Enterprise Java Practical						45	5	50

1.f Faculty-Wise Distribution of all Lecture-Practical-Tutorial Hours for the Course

Divisions	Lecture (Hrs.)	Practical (Hrs.)				Tutorial (Hrs.)			
		Batch 1	Batch 2	Batch 3	Batch 4	Batch 1	Batch 2	Batch 3	Batch 4
Div A	4	2	2	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Div B	4	2	2	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Div C	4	2	2	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Div D	4	2	2	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

1.g Office Hours (Faculty will be available in office in this duration for solving students' query)

Division	Day	Time (at least 1 Hr. / Division)	Venue (Office Room No.)
	Monday	9:00a.m – 10:00 a.m	X-011

2.a Syllabus : Module Wise Teaching Hours and % Weightage in University Question Paper

Module No.	Module Title and Brief Details	Teaching Hrs. for each module	% Weightage in University Question Papers
1	Understanding Java EE & Introduction to Java Servlets	10	20
2	Servlets: RequestDispatcher, Cookie, Session & Working with Files & Non-Blocking I/O	11	20
3	Java Server Page(JSP), Expression Language, Java Server Pages Standard Tag Library	09	20

4	Working with Enterprise Java Beans and JNDI	10	20
5	Persistence, ORM and JPA and writing Hibernate Applications	10	20
* Insert rows for more modules in the Course	**Total**	**50**	**100**

2.b Prerequisite Courses

No.	Semester	Name of the Course	Topic/s
1	1	Imperative Programming	ALL
2	2	Object Oriented Programming	ALL
3	3	DBMS	ALL
4	4	Core Java	ALL

2.c Relevance to Future Courses

No.	Semester	Name of the Course
1	BScIT (sem VI)	Project Implementation
2	MScIT(Sem II)	Mobile Computing

2.d Identify real life scenarios/examples which uses the knowledge of the subject (Discussion on how to prepare examples and case studies e.g. "Boeing Plane": C Programming Language – Intro to Computer Science – Harvard's CS50 (2018) – Bing video)

Real Life Scenario	Concept Used
Third party Trading Application like Murex	Hibernate framework
Applications like Netflix, Google Earth, QRReader	Various Java Frameworks
E – commerce applications – Jabong, Myntra, Flipkart	Hibernate, JPA
Travel applications – Trivago, Ibibo, TripAdvisor	Implements core Java enterprise specifications, like servlets
Web based applications like – IRCTC, Gmail, Google sheets, Google slides	Hibernate ORM

3 Past Results – Division-Wise

Details	Target – Apr 2023	Oct 2022	Oct 2021	Oct 2020
Course Passing % – Average of 2 Divisions	85%	76%	100%	100%
Marks Obtained by Course Topper (mark/100)	90	76	90	98

	Div A		Div B		Div C		Div D		Div E		Div F	
Year	Initials of Teacher	% Result	Initials of Teacher	% Result	Initials of Teacher	% Result	Initials of Teacher	% Result	Initials of Teacher	% Result	Initials of Teacher	% Result
Apr 2022	KG	100	KG	98.46	SB	100	KG	100	NA	NA	AR	100
Apr 2021	SB/KG	100	SB/KG	100	SB/KG	100	SB/KG	98.36	SB/KG	100	AR	100
Apr 2020	BK	100	SBB	100	BK	98.44	SBB	98.36	SBB	100	AR	97.06

4 All the Learning Resources – Books and E-Resources

4.a List of Text Books (T – Symbol for Text Books) to be Referred by Students

Sr. No	Text Book Titles	Author/s	Publisher	Edition	Module Nos.
1	Java EE 7 For Beginners	Sharanam Shah, Vaishali Shah	SPD	First	1-5
2	Enterprise Java	Dr. Tushar Sambare	Sheth		1-5
3	Java EE 8 Cookbook: Build reliable applications with the most robust and mature technology for enterprise development	Elder Moraes	Packt	First	1-5
4	Advanced Java Programming	Uttam Kumar Roy	Oxford Press		1-3

4.b List of Reference Books (R – Symbol for Reference Books) to be Referred by Students

Sr. No	Reference Book Titles	Author/s	Publisher	Edition	Module Nos.
1	Objects First With Java - A Practical Introduction Using BlueJ	David J. Barnes & Michael Kölling.	Pearsons	6	1-4
2	Programming With Java: A Primer 3E	Balaguruswamy	McGraw Hill	5	1-4
3	Schaum's Outline of Theory and Problems of Programming with Java	John Rast Hubbard	McGraw Hill	2016	3-5
4	Learning Java: A Bestselling Hands-On Java Tutorial	Patrick Niemeyer, Daniel Leuck	O'Reilly	2013	5

4.c List of E - Books (E – Symbol for E-Books) to be Referred by Students

Sr. No	E- Book Titles	Author/s	Publisher	Edition	Module Nos.
1	Java™ Platform, Enterprise Edition (Java EE) Specification,	Linda DeMichiel, Bill Shannon	Oracle	2013	1-4

	v7download.oracle.com/otn-pub/jcp/java_ee-7-fr-spec/JavaEE_Platform_Spec.pdf				
2	FINAL - Java EE https://javaee.github.io/servlet-spec/downloads/servlet-3.1/Final/servlet-3_1-final.pdf	Shing Wai Chan Rajiv Mordani	Oracle	2013	1-3

4.d Reading latest / top rated research papers (at least 5 papers)

Name of Paper	Name of Authors (Background)	Published in		Problem Statement
		Date	Journal	
Static Analysis of Java Enterprise Applications: Frameworks and Caches, the Elephants in the Room	Anastasios Antoniadis University of Athens Nikos Filippakis,CERN Paddy KrishnanOracle Labs Australia	June 2020	PLDI 2020	Develop a java program to develop an online banking system which deals with the account creation, transaction and display account statement.
Enterprise Java Applications and SAP R/3 System Integration Using JeO	Jitao Yang, Hongqi Su, Yuanfeng Wu, Department of Computer Science, China University of Mining & Technology Junwei Liu, Industry Application Division, Computer System Business Group, Tsinghua Tongfang Co. Ltd	January 2007	Research and Practical Issues of Enterprise Information Systems II	Explore JCO. Compare the various frameworks available.
Component replication in distributed systems: a case study using Enterprise Java Beans	Achmad I. Kistijantoro, Graham Morgan, SantoshK. Shrivastava, School of Computing Science, Newcastle University,	2003	Proceedings of the IEEE Symposium on Reliable Distributed Systems	Design a java bean that issues an SQL statement.

	Mark C. Little, Arjuna Technologies Ltd.			
Performance Evaluation of Java Programming Strategies	Qusay Idrees Sarhan, Department of Computer Science, College of Science, University of Duhok, Duhok, Kurdistan Region, Iraq	2021	Academic Journal of Nawroz University (AJNU), Vol.10, No.4, 2021	Optimize the given code so that it requires less time for execution.

4.e **Based on research paper an identify the current Problem statement**

Problem Statement			Used in				
	Quiz	Assignment	Lab	Mini Project	Poster Presentation	Test	Any Other
Write a java program to design an interface for employees which gets and displays employee details with the help of Servlets & JDBC.		Y	Y				
Explore JCO. Compare the various frameworks available.		Y				Y	
Design a java bean that issues an SQL statement.		Y		Y			
Optimize the given code so that it requires less time for execution.		Y	Y				

4.f **Identify Companies / Industries which use the knowledge of the subject and thus may provide Internships and final Placements**

Name of the Company	To be / Contacted for		
	Student Internship	Student Final Placement	Faculty Internship
Deloitte	✓		

4.g Identify suitable relevant TOP Guest Speakers from Industry

(CS50 Lecture by Mark Zuckerberg - 7 December 2005 - YouTube)

Name of the Identified Guest Speaker	Designation	Name of the Company
Mr. Akif Dadan	Senior Software Engineer	Waseel ASP Ltd., Riyadh

4.h Identify relevant Technical competitions to participate [Competitions -Paper Presentations, Projects, Hackathons, IVs etc..]

Name of the Relevant Technical Competition Identified to participate	Organized by	Date of the Event
V – Search	VSIT	February 2024
Codathon	VSIT	Yet to be decided

4.i Identify faculty in TOP schools / Universities who are teaching same / similar subject and develop rapport e.g. Exchange Lecture Material (Assignments / Tests / Project etc..), Joint Paper Publication

University	Name of the Course	Name of Faculty	Type of Collaboration		
			Exchange of Lecture Material	Joint Publication/ Research	Other
NM College	Enterprise Java	Mr. Prashant Jadhav	Yes	-	-

4.j Module Best Available in - Title best resource [from *4.a* to *4.d* in this AAP] & give details

Module No.	Title of the Module	Web Link	Mention the Tile			
			Journal	E-Journal	Magazine	Other Resource
1	Understanding Java EE & Introduction to Java Servlets	https://www.youtube.com/watch?v=7TOmdDJc14s&t=98s What are Servlets?				Java EE 7 For Beginners(chapter no 2 to 7- page no 15 to 188)
2	Servlets: RequestDispatcher, Cookie, Session & Working with Files & Non-Blocking I/O	https://docs.oracle.com/javaee/5/tutorial/doc/bnafe.html#:~:text=A%20servlet%20is%20a%20Java,applications%20hosted%20by%20web%20servers.				Java EE 7 For Beginners(chapter no 9,10,12,13,14- page no 189 to 276,309 to 370)
3	Java Server Page(JSP), Expression Language, Java Server	https://www.ibm.com/docs/en/was-nd/9.0.5?topic=applications-javaserver-pages				Java EE 7 For Beginners(chapter no 15-19-page no 371-506)

	Pages Standard Tag Library					
4	Working with Enterprise Java Beans and JNDI	https://www.baeldung.com/jndi	https://www.javadevjournal.com/			Java EE 7 For Beginners(chapter no 30-36-page no 765-900)
5	Persistence, ORM and JPA and writing Hibernate Applications	https://www.studytonight.com/java/java-awt.php			https://www.infoworld.com/article/3379043/what-is-jpa-introduction-to-the-java-persistence-api.html	Java EE 7 For Beginners chapter no 37,38,39,41, 42-page no 901-960, 969,1004

4.k **Referred to any top-rated university in that subject for content**

University	Name of the Course	Name of Faculty	Date of Delivery of the Course	Remarks
IIT Bombay	Java Business Application	Prof. Kannan Moudgalya		https://onlinecourses.swayam2.ac.in/aic20_sp14

4.l **Faculty received any certification related to this subject. List of Certifications Identified / Done**

Course	Certifying Agency	No. of Hours	Level of the Course		Certification		Remarks
			Introductory	Advance Skill Development	Done on	Proposed to be on	
Spoken Tutorial	IIT Bombay	30 hrs	✓		✓		

4.m **Completed subject wise/cluster wise training with cluster mentor. List of relevant Refresher Course Identified / Done**

Course	Certifying Agency (As suggested by DAB/Cluster Mentor/Industry/ University other than MU)	Certification		Remarks
		Done on	Proposed to be on	
Pedagogy				

PBL				
Sub. Content Training				

4.n Best Practices Identified and adopted

No.	Item	Best Practices Identified		
		Univ. 1 – IIT Mumbai	Univ. 2 – AMU	Univ. 3 – Stanford University
1	Microsite			
2	Video Lectures	✓		
3	Assignments		✓	✓
4	Mini Project			
5	Assessment Metric			
6	Quizzes	✓		
7	Labs/ Practical (PBL)	✓		✓
8	Tests			
9	Peer Assessment			
10	Any Other			

4.o Web Links for Online Notes/YouTube/VSIT Digital Content/VSIT Lecture Capture/NPTEL Videos

Students can view lectures by VSIT professors, captured through LMS 'Lecture Capture' in VSIT campus for previous years.

No.	Websites / Links	Module Nos.
1	Digital Content (v-refer)	1-5
2	Online Notes and PPTs (v-refer)	1-5
3	Why JSP? https://www.youtube.com/watch?v=5Sz8z1Yreow	3
4	JDBC Connectivity https://www.youtube.com/watch?v=5vzCjvUwMXg	1
5	Hibernate https://www.youtube.com/watch?v=PMR0ld5h938	5

4.p Recommended MOOC Courses like Coursera / NPTEL / MIT-OCW / edX/VAC etc.

Sr. No.	MOOC Course Link	Course conducted by – Person / University / Institute / Industry	Course Duration	Certificate (Y / N)
1.	Fundamentals of Java EE Development https://www.edx.org/course/fundamentals-of-java-ee-development	edX	7 weeks	Y
2.	Learn Java Servlets and JSP web application. https://www.udemy.com/learn-java-servlets-and-jsp-web-application-in-25-steps/	Udemy	25videos	Y
3.	Java Business Application	Spoken Tutorial	17 videos	Y

5 Consolidated Course Lesson Plan

	From (date/month/year)	From (date/month/year)	Total Number of Weeks
Semester Duration	12/06/2023		14

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
1	1	**Unit I**	**Understanding Java EE:** What is an Enterprise Application? What is java enterprise edition?		CO1		2/15/Java EE 7 by Sharanam Shah
	2	1	Java EE Technologies, Java EE evolution, Glassfish server		CO1		2/18/Java EE 7 by Sharanam Shah
	3	1	**Java EE Architecture, Server and Containers:** Types of System Architecture, Java EE Server, Java EE Containers.		CO1		3/55/Java EE 7 by Sharanam Shah
	4	1	**Introduction to Java Servlets:** The Need for Dynamic Content, Java Servlet Technology		CO1		5/79/Java EE 7 by Sharanam Shah
2	5	1	Why Servlets? What can Servlets do? Java Servlet API		CO1		5/82/Java EE 7 by

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
							Sharanam Shah
	6	1	The Servlet Life Cycle, A Simple Welcome Servlet Working		CO1		6/87/Java EE 7 by Sharanam Shah
	7	1	Getting Started, Using Annotations Instead of Deployment Descriptor		CO1		6/117/Java EE 7 by Sharanam Shah
	8	1	What Is JDBC? JDBC Architecture The Servlet GUI and Database Example		CO1		7/123/Java EE 7, 8/149 by Sharanam Shah
3	9	1	Viva/ Question Solving on Unit I		CO1		
	10	1	Viva/ Question Solving on Unit I		CO1		
	SS	1	The Servlet Skeleton		CO1		6/87/Java EE 7 by Sharanam Shah
	SS	1	Accessing Database		CO1		7/123/Java EE 7, 8/149 by Sharanam Shah
	11	**Unit II**	Resquestdispatcher Interface, Methods of Requestdispatcher, Requestdispatcher Application		CO2		12/309/Java EE 7 by Sharanam Shah
	12	2	Creating Cookies Using Servlet		CO2		9/189/Java EE 7 by

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
							Sharanam Shah
4	13	2	Dynamically Changing The Colors Of A Page		CO2		9/215/Java EE 7 by Sharanam Shah
	14	2	Lifecycle Of Http Session, Session Tracking With Servlet API		CO2		10/227/Java EE 7 by Sharanam Shah
	15	2	A Servlet Session Example		CO2		10/255/Java EE 7 by Sharanam Shah
	16	2	Uploading Files, Creating an Upload File Application		CO2		13/331/Java EE 7 by Sharanam Shah
5	17	2	Downloading Files, Creating a Download File Application		CO3		13/345/Java EE 7 by Sharanam Shah
	18	2	Creating a Non-Blocking Read Application, Creating The Web Application		CO2		14/355/Java EE 7 by Sharanam Shah
	19	2	Creating Java Class, Creating Servlets, Retrieving The File, Creating index.jsp		CO2		14/357,372/Java EE 7 by Sharanam Shah
	20	2	Viva/ Question Solving on Unit II		CO2		

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
	SS	2	Kinds of Cookies, Where Cookies Are Used?		CO2		9/189/Java EE 7 by Sharanam Shah
	SS	2	What Are Sessions?		CO2		10/227/Java EE 7 by Sharanam Shah
6	21	2	Viva/ Question Solving on Unit II		CO2		
	22	**Unit III**	Why use Java Server Pages? Disadvantages Of JSP, JSP v\s Servlets, Life Cycle of a JSP Page		CO3		15/372/Java EE 7 by Sharanam Shah
	23	3	How does a JSP function? How does JSP execute? About Java Server Pages, Comments, JSP Document		CO3		15/377/Java EE 7 by Sharanam Shah
	24	3	JSP Elements, JSP GUI Example, Including other Files		CO3		16/385/Java EE 7, 17/418 by Sharanam Shah
7	25	3	Forwarding JSP Page to Another Page, Passing Parameters for other Actions		CO3		18/429/Java EE 7 by Sharanam Shah
	26	3	Implicit Objects, Character Quoting Conventions		CO3		18/440/Java EE 7, 19/474/475 by Sharanam Shah

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
	27	3	Unified Expression Language [Unified El], Expression Language,		CO3		18/440/Java EE 7, 19/474/475 by Sharanam Shah
	28	3	What is wrong in using JSP Scriptlet Tags? Tag Libraries		CO3		18/440/Java EE 7, 19/474/475 by Sharanam Shah
8	29	3	Viva/ Question Solving on Unit III		CO3		
	30	3	Viva/ Question Solving on Unit III		CO3		
	SS	3	Loading a Javabean		CO3		18/429/Java EE 7 by Sharanam Shah
	SS	3	How JSTL Fixes JSP Scriptlet's Shortcomings? Disadvantages Of JSTL,		CO3		18/440/Java EE 7, 19/474/475 by Sharanam Shah
	31	**Unit IV**	Enterprise Bean Architecture, Benefits of Enterprise Bean, Types of Enterprise Bean		CO4		30/765/Java EE 7 by Sharanam Shah
	32	4	Accessing Enterprise Beans, Enterprise Bean Application, Packaging Enterprise Beans		CO4		30/774/Java EE 7 by Sharanam Shah

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
9	33	**4**	When to use Session Beans? Types of Session Beans, Remote and Local Interfaces, Accessing Interfaces		CO4		30/777/Java EE 7 by Sharanam Shah
	34	4	Packaging Enterprise Beans, Example of Stateful Session Bean,		CO4		32/798/Java EE 7 by Sharanam Shah
	35	4	Example of Stateless Session Bean, Example of Singleton Session Beans		CO4		32/805/Java EE 7 by Sharanam Shah
	36	4	Lifecycle of a Message Driven Bean, Uses of Message Driven Beans, The Message Driven Beans Example		CO4		32/829/Java EE 7 by Sharanam Shah
10	37	4	Request And Interceptor, Defining An Interceptor, AroundInvoke Method, Applying Interceptor, Adding An Interceptor To An Enterprise Bean,		CO4		33/847/Java EE 7 by Sharanam Shah
	38	4	Build and Run the Web Application, What is Naming Service? What is Directory Service? What is Java Naming and Directory interface? Basic Lookup, JNDI Namespace in Java EE		CO4		34/871/Java EE 7 by Sharanam Shah
	39	4	Viva/ Question Solving on Unit IV		CO4		
	40	4	Viva/ Question Solving on Unit IV		CO4		
	SS	4	Resources and JNDI, Datasource Resource Definition in Java EE.		CO4		34/871/Java EE 7 by Sharanam Shah

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
	SS	4	Lifecycle of Enterprise Beans		CO4		33/847/Java EE 7 by Sharanam Shah
11	41	**Unit V**	What is Persistence? Persistence in Java, Current Persistence Standards in Java, Why another Persistence Standards? Object/Relational Mapping,		CO5		37/902/Java EE 7 by Sharanam Shah
	42	5	The Java Persistence API, JPA, ORM, Database and the Application		CO5		38/915/Java EE 7 by Sharanam Shah
	43	5	Architecture of JPA, How JPA Works? JPA Specifications.		CO5		38/919/Java EE 7 by Sharanam Shah
	44	5	Application Requirement Specifications, Software Requirements, The Application Development Approach		CO5		39/934/Java EE 7 by Sharanam Shah
12	45	5	Creating Database And Tables in Mysql, Creating a Web Application, Adding the Required Library Files, Creating a Javabean Class, Creating Persistence Unit [Persistence.Xml], Creating JSPS, The JPA Application Structure, Running The JPA Application		CO5		39/938/Java EE 7 by Sharanam Shah
	46	5	Creating Database And Tables in Mysql, Creating a Web Application, Adding the Required Library Files, Creating a Javabean Class, Creating Persistence Unit [Persistence.Xml], Creating JSPS, The JPA Application Structure, Running The JPA Application		CO5		41/969/Java EE 7 by Sharanam Shah

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
	47	5	What is Hibernate? Why Hibernate? Hibernate,		CO5		41/973/Java EE 7 by Sharanam Shah
	48	5	Database and The Application, Components of Hibernate, Architecture of Hibernate, How Hibernate Works?		CO5		42/993/Java EE 7 by Sharanam Shah
13	49	5	Creating Hibernate Configuration File, Adding a Mapping Class, Creating JSPS, Running The Hibernate Application		CO5		42/993/Java EE 7 by Sharanam Shah
	50	5	Viva/ Question Solving on Unit V		CO5		
	SS	5	Application Requirement Specifications, Software Requirements, The Application Development Approach		CO5		42/993/Java EE 7 by Sharanam Shah
	SS	5	Creating Database and Tables in Mysql, Creating a Web Application, Adding The Required Library Files, Creating a Javabean Class,		CO5		39/938/Java EE 7 by Sharanam Shah

6 Rubric for Grading and Marking of Term Work (inform students at the beginning of semester)

Lecture + Practical (% of class participation) & Marks	Assign-ments	Tutorial	Lab / Practical Performance	Lab Journal Assessment	Class Tests (Other than IA)	Other (1) Specify	Other (2) specify	Total
75% Attendance	10	-	Practical Exam – 40 Marks Viva – 05	05		IA 1 (Descriptive) - 20 Marks, Scaled to 15 Marks	-	75

7 Assignments / Tutorials Details

Assignment/ Tutorial No.	Title of the Assignments / Tutorials	CO Map	Assignment/ Tutorials given to Students on	Week of Submission
1	Understanding Java EE & Introduction to Java Servlets	CO1	3rd Week	4th Week
2	Worksheet on JSP & Servlets	CO2	6th Week	7th Week
3	Develop an application using Hibernate	CO5	11th Week	12th Week

Analysis of Assignment / Tutorial Questions and Related Resources

Assignment / Tutorial No.	Week No.	Type* (√)			Module No.	Based on #			Question Type (√)	
		R	PQ	OBT		Text Book	Reference Book	Other Learning Resource	MU EQ	Thought Provoking
1	3	✓			1	4a(1)			✓	✓
2	6				2					✓
3	11	✓			5					✓

* Tick (√) the Type of the Assignment: Regular (R); Pop Quiz (PQ) ; Open Book Test for TE/BE/ME (OBT)
# Write number for text book, reference book, other learning resource from this AAP – *from Points 4.a to 4.d*

8 Internal Assessment / Other Class Test / Open Book Test (OBT)/Take Home Test (THT) Details

Tests	Test Dates	Module No.	CO Map	IA Question Paper Pattern	Policy
1st IA Test	6th week	1,2	1,2	IA 1 (Descriptive 20M) (Scaled to 15)	No IA Re-test IA is a Head of passing *
Pop Quiz	After each Unit	1-5	1-5	MS Teams	
Open Book Test	11th week	4	4	MS Teams	
Class Test	After every unit	1-5	1-5	MS Teams	
Class tests / prelims					

Class tests / prelims					
Any other test/exams					

*** Failures of IA test (IA1+IA2) shall appear for IA test in the next semester. There is no provision for re-test in the same semester.**

9.a Practical Activities

Practical No.	Module No.	Title of the **Experiments**	Type of Experiment		Topics to be highlighted	CO Map
			PBL	Newly Added		
1	1	Implement the Simple Servlet applications.			Servlets	CO1
2	1	Implement the Servlet applications with Cookies and Sessions.			RequestDispatcher, Cookie, Session	CO1
3	2	Implement the Servlet IO and File applications.			Upload and Download File, Nonblocking I/O	CO2
4	2	Implement the JSP applications.			JSP's	CO2
5	3	Implement the JSP JSTL and EL Applications.			Tag Library and Expression Language	CO3
6	3	Implement the EJB Applications			EJB's	CO3
7	4	Implement the EJB applications with different types of Beans			Session Beans and Message Driven Bean	CO4
8	4	Implement the JPA applications with ORM and Hibernate.	✓		Java Persistence API, Object Relational Mapping	CO5
9	5	Implement the Hibernate applications.	✓		Hibernate Framework	CO5

10 Beyond Syllabus Activities for Gap Mitigation

No.	Type of the Activity	Activities	Number of beneficiaries	Other Details – guest profile, feedback, mark sheet, report
1	**Experiential learning/Interaction with Outside World**	1- Guest Lectures by Industry Expert	30	Mr. Akif Dadan, Senior Software Engineer, Waseel ASP Ltd., Riyadh
		2- Workshops		
		3- Mini Project	30	
		4- Industrial Visit		
		5- Any other activity		
2	**Collaborative & Group Activity**	6- Poster Presentation	15	
		7- Minute Papers		
		8- Students Seminars		
		9- Students Debates		
		10- Panel Discussion / Mock GD		
		11- Mock Interview		
		12- Any other activity		
3	**Co-Curricular Activity**	13- Informative videos (NPTEL/Youtube /TEDx/ MIT OW/edX)	30	
		14- Lecture Capture Usage		
		15- Any other activity		
4	**Tests & Assessments**	16- Class Tests/ Weekly Tests	30	
		17- Pop Quiz	30	
		18- Mobile App Based Quiz		
		19- Open Book Test	30	
		20- Take Home Test	30	

21- Any other activity

11.1 One-on-One Academic Mentoring Meetings done

No.	Name of Mentee	Date of One-On-One Meeting		
		Beginning of Sem.	After Mid Term Results	Before End Sem.

11.2 Identify concerns and refer appropriately

No.	Name of Mentee	Action Taken		
		Individual Goals Identified	Any Financial Concern which needs to be referred to	Any Emotional Concern to be referred to

*** Do not delete any activity. Give details for planned events. Write 'NA' for activity Not Planned.**

Consolidated Academic Administration Plan Prepared by (mention all theory teaching faculty names with signature)

Please write below your name and sign with date of the external cluster mentor meeting

Ms. Ketaki Ghawali

External Industry Mentor

VENKATA SATISH GUTTULA

External Academic Mentor

VSIT Cluster Mentor

Program HOD

VSIT
Vidyalankar School of Information Technology

Version 05/23-9

Consolidated Academic Administration Plan for the Course

Introduction to Embedded Systems

Sem. IV – Program B.Sc. IT 2023-24 – Even Semester

Faculty - Prof. Umesh Koyande, Prof. Sabir Shaikh, Prof. Maitreyi Joglekar

The academic resources available in VSIT –

VMIS (ERP)	V-Refer and V-Live	VSIT Library	VAC & MOOC Courses
Institute & Department Vision and Mission	Former IA question papers and solutions (prepared by faculty)	Former IA question papers solutions - hardcopy	Value Added Courses (VAC) are conducted throughout the semester & in the semester break - Enrol for the VACs
Program Educational Objectives (PEO)	MU end semester examination question papers and solutions (prepared by faculty)	MU end semester exam question paper & solutions - by faculty, hardcopy	
Program Specific Outcome (PSO)	Class notes and Digital Content for the subject (scanned / typed by faculty)	All text books, reference books, e -books mentioned in the syllabus & AAP	Online courses from NPTEL, Coursera etc. are pursued throughout the semester - Register for the course & get certified
Program Outcome (PO)	Comprehensive question bank, EQ, GQ, PPT, Class Test papers	Technical journals and magazines for reference	
Departmental Knowledge Map	Academic Administration Plan & Beyond Syllabus Activity report	VSIT library is member of IIT Bombay Library	Watch former lectures captured in LMS at VSIT

1.a Course Objectives (Write in detail – as per NBA guidelines)

Cognitive	What do you want students to know?	To understand the fundamentals and practical applications of Embedded Systems.
Affective	What do you want students to think / care about?	To nurture a mindset that prioritizes creative problem-solving and optimal resource use in their work.
Behavioural	What do you want students to be able to do?	Students should be able to proficiently program microcontrollers, demonstrating practical application through Arduino-based projects.

Advice to Students:

Attend every class!!! Missing even one class can have a substantial effect on your ability to understand the course. Be prepared to think and concentrate, in the class and outside. I will try to make the class very interactive. Participate in the class discussions. Ask questions when you don't understand something. Keep up with the class readings. Start assignments and homework early. Meet me in office hour to discuss ideas, solutions or to check if what you understand is correct.

Collaboration Policy:

We encourage discussion between students regarding the course material. However, no discussion of any sort is allowed with anyone on the assignment and homework for the class. If you find solution to some problems in a book or on the internet, you may use their idea for the solution; provided you acknowledge the source (name and page in the book or the website, if the idea is found on the internet). Even though you are allowed to use ideas from another source, you must write the solution in your own words. If you are unsure whether or not certain kinds of collaboration is possible, please ask the teacher.

1.b Course Outcome (CO) Statements and Module-Wise Mapping (follow NBA guideline)

CO No.	Statements	Related Module/s
CO1	To understand PIC and ARM controller architectures and recognize their industry significance.	Unit 1
CO2	To comprehend and implement various communication protocols interfacing microcontrollers with diverse devices in embedded systems.	Unit 2
CO3	To understand the Arduino architecture and be proficient in programming using the Arduino IDE.	Unit 3
CO4	To integrate diverse sensors and control actuators using Arduino for versatile applications.	Unit 4
CO5	To understand wireless control with Arduino and effectively apply this knowledge to design projects and tackle real-world applications.	Unit 5

1.c Mapping of COs with POs (mark S: Strong, M: Moderate, W: Weak, Dash '–': not mapped)

(List of POs is available in V-refer)

	PO 1	PO 2	PO 3	PO 4	PO 5
CO 1			3	2	
CO 2	3			3	
CO 3	2	3			
CO 4	3			2	
CO 5	3	2	3		3

1.d Mapping of COs with PSOs (mark S: Strong, M: Moderate, W: Weak, Dash '–':not mapped)

	PSO 1	PSO 2	PSO 3	PSO 4
CO 1				
CO 2				
CO 3				
CO 4				
CO 5				

1.e Teaching and Examination Scheme (As specified by the University) for the Course

Categories	Humanities and Social Sciences	Basic Science	Engineering Science	Professional Core	General Education	Professional Elective	Project/ Internship	Open Elective
Tick suitable category			✓					

Subject Code	Subject Name	**Teaching Scheme**	Credits Assigned

		Theory	Practical	Tutorial	Theory	TW/Practical	Tutorial	Total
USIT402	Introduction to Embedded Systems	75	-		2	-		2
USIT4P2	Introduction to Embedded Systems	-	50		-	2		2

Subject Code	Subject Name	Examination Scheme						
		Theory Marks IA Test		End Sem. Exam Marks	TW	Practical	Oral	Total
		IA	Average of IA1 and IA2					
USIT402	Introduction to Embedded Systems	30 Marks (Scaled down to 15)		75	25	-		100
USIT4P2	Introduction to Embedded Systems					50		50

1.f Faculty-Wise Distribution of all Lecture-Practical-Tutorial Hours for the Course

Divisions	Lecture (Hrs.)	Practical (Hrs.)				Tutorial (Hrs.)			
		Batch 1	Batch 2	Batch 3	Batch 4	Batch 1	Batch 2	Batch 3	Batch 4
Div A	4	2	2	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Div B	4	2	2	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Div C	4	2	2	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Div D	4	2	2	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Div E	4	2	2	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Div F	4	2	2	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

1.g Office Hours (Faculty will be available in office in this duration for solving students' query)

Division	Day	Time (at least 1 Hr. / Division)	Venue (Office Room No.)
Div A	Monday	3:00 pm - 4:00 pm	X-115
Div B	Monday	3:00 pm - 4:00 pm	X-115
Div C	Monday	3:00 pm - 4:00 pm	X-115
Div D	Monday	3:00 pm - 4:00 pm	X-115
Div E	Monday	3:00 pm - 4:00 pm	X-115
Div F	Monday	3:00 pm - 4:00 pm	X-115

2.a Syllabus : Module Wise Teaching Hours and % Weightage in University Question Paper

Module No.	Module Title and Brief Details	Teaching Hrs. for each module	% Weightage in University Question Papers
1	PIC microcontroller, Advanced ARM Controllers	12	20
2	Communication Protocol & Implementation	8	20
3	Getting Started with Arduino, Basic Functions:	12	20
4	Using Sensors with the Arduino, Electromechanical Control Using the Arduino	8	20
5	Wireless Control Using the Arduino, Case Studies	10	20
* Insert rows for more modules in the Course **Total**		**50 hrs**	**100 %**

2.b Prerequisite Courses

No.	Semester	Name of the Course	Topic/s
1	B.Sc. IT Sem I	Operating System	Operating system basics, types of operating systems, Real-Time Characteristics, Selection, Process of an RTOS, Device driver
2	B.Sc. IT Sem I	Imperative Programming	Data types and time delay in 8051 C, basic C Programming
3	B.Sc. IT Sem II	Microprocessor Architecture	All

2.c Relevance to Future Courses

No.	Semester	Name of the Course
1	B.Sc.IT Sem V	Internet of things
2	B.Sc.IT Sem V & VI	Project based on Embedded System

2.d Identify real life scenarios/examples which uses the knowledge of the subject (Discussion on how to prepare examples and case studies e.g. "Boeing Plane": C Programming Language – Intro to Computer Science – Harvard's CS50 (2018) – Bing video)

Real Life Scenario	Concept Used
Automotive Control Systems	Real-time operating systems (RTOS), sensor integration, control algorithms
Medical devices like pacemakers	Sensor interfacing, data processing, feedback control systems
Smart Home Automation	Wireless communication, sensor networks, user interface design
Industrial Automation	Programmable logic controllers (PLCs), motor control
Consumer Electronics	Power management, user interface, connectivity

3 Past Results – Division-Wise

Details	Target – Apr 2023	Apr 2022	Apr 2021	Apr 2020

Course Passing % – Average of 6 Divisions	90 %			
Marks Obtained by Course Topper (mark/100)	85			

	Div A		Div B		Div C		Div D		Div E		Div F	
Year	Initials of Teacher	% Result	Initials of Teacher	% Result	Initials of Teacher	% Result	Initials of Teacher	% Result	Initials of Teacher	% Result	Initials of Teacher	% Result
Apr 2024												

4 All the Learning Resources – Books and E-Resources

4.a List of Text Books (T – Symbol for Text Books) to be Referred by Students

Sr. No	Text Book Titles	Author/s	Publisher	Edition	Module Nos.
1	PIC Microcontroller and Embedded Systems	Muhammad Ali Mazidi, Rolin McKinlay, Danny Causey	Cengage Learning Asia	-	Unit 1, 2
2	ARM System Developer's Guide: Designing and Optimizing System Software	Andrew Sloss, Dominic Symes, Chris Wright	West Publishing Company	-	Unit 3,4

4.b List of Reference Books (R – Symbol for Reference Books) to be Referred by Students

Sr. No	Reference Book Titles	Author/s	Publisher	Edition	Module Nos.
1	Programming Embedded Systems in C and C++	Michael Barr	O'Reilly	First	2
2	Introduction to embedded systems	Shibu K V	Tata Mcgraw-Hill	First	1, 2 & 5
3	The 8051 Microcontroller and Embedded Systems	Muhammad Ali Mazidi	Pearson	Second	3 & 4
4	Embedded Systems	Rajkamal	Tata Mcgraw-Hill	Second	4

4.c List of E - Books (E – Symbol for E-Books) to be Referred by Students

Sr. No	E- Book Titles	Author/s	Publisher	Edition	Module Nos.
1	Programming Embedded Systems in C and C++	Michael Barr	O'Reilly	First	2
2	Embedded systems Notes https://nptel.ac.in/downloads/108105057/	NPTEL			2,3 & 5
3	Introduction to Embedded Systems https://www.pdfdrive.com/embedded-systems-lee-and-seshia-introduction-to-embedded-e6263456.html	Lee & Seshia			1 to 4

4	So you wanna be an Embedded Engineer https://www.pdfdrive.com/so-you-wanna-be-an-embedded-engineer-the-guide-to-embedded-engineering-from-consultancy-to-the-corporate-ladder-e157696008.html	Lewin A. R.W.Edwards	Newnes		1,2,3

4.d Reading latest / top rated research papers (at least 5 papers)

Name of Paper	Name of Authors (Background)	Published in		Problem Statement
		Date	Journal	
Automated liquid filling system with a robotic arm conveyor for small scale industries	Abdulrazaq Nafiu Abubakar,Suman Lata Dhar, Abdullateef Abba Tijjani, Auwalu Muhammad Abdullahi	Dec 2022	National Conference on Functional Materials: Emerging Technologies and Applications in Materials Science, Elsevier	The paper employs a robotic arm, Arduino Mega 2560 controller, gear motors, IR proximity sensor for bottle detection, and an ultrasonic sensor for liquid level monitoring. Successful testing was conducted, with potential future enhancements suggested.
Efficient Usage of water for smart irrigation system using Arduino and Proteus design tool	Shwetha N, Niranjan L (Department of Electronics and Communication Engineering, Dr. Ambedkar Institute of Technology, Bangalore)	Oct 2022	IEEE 2nd International Conference on Smart Electronics and Communication	To optimize usage of water in agriculture crops, this research work has proposed an automatic irrigation system. The temperature and moisture sensors are used in the roots of the plants which are connected to a wireless network of systems.
Profile Recognition for Accessibility and Inclusivity in Smart Cities Using a Thermal Imaging Sensor in an Embedded System	Rani Baghezza, Kevin Bouchard, Abdenour Bouzouane	May 2022	IEEE Internet of Things Journal (Volume: 9, Issue: 10)	This article tackles the challenge of using machine learning to recognize the profile of pedestrians based on their gait and silhouette with the use a thermal camera (FLIR Lepton) connected to a Raspberry Pi.
Opportunities and Trends of Wireless Communications	Sivaraman Eswaran	Jul 2022	IRO Journal on Sustainable Wireless Systems-Vol. 4, Iss: 2	The paper analyzes the current status of wireless communication in different states and projects the research opportunities by exploring the future expectations of wireless communications.
Design and Development of An Automatic Door Gate Based on Internet of Things Using Arduino Uno	Arnawan Hasibuan, Rosdiana, Dewi Sartika Tambunan (Department of Electrical	June 2021	Bulletin Of Computer Science And Electrical Engineering VOL. 2 NO. 1	This study aims to design a prototype of an automatic gate drive by utilizing a DC motor in order to be able to control the house gate automatically and be able to open the door or close the

	Engineering, Universitas Malikussaleh, Indonesia)			door by using an application on a Smartphone.

4.e **Based on research paper an identify the current Problem statement**

Problem Statement			Used in				
	Quiz	Assignment	Lab	Mini Project	Poster Presentation	Test	Any Other
Current issues in the automated liquid filling system include potential errors from solid-state devices and limitations with the electric pump. What all different sensors can be used instead of IR proximity sensor? Compare and Contrast.		Yes		Yes			
Propose potential enhancements or modifications to the system for broader applicability. How could advancements in technology further improve the effectiveness of automatic irrigation in agriculture?		Yes		Yes			
Explain the role of a thermal camera (FLIR Lepton) in the proposed system. How does it contribute to the recognition of pedestrian profiles? Why a Raspberry Pi chosen as the hardware platform for this application?		Yes		Yes			
Summarize the key findings regarding the status of wireless communication in different states. Identify any common trends or disparities observed across the states.		Yes		Yes			
Explain the role of a DC motor in the automatic gate system. How does the smartphone application communicate with and control the gate system?		Yes	Yes	Yes			

4.f **Identify Companies / Industries which use the knowledge of the subject and thus may provide Internships and final Placements**

Name of the Company	To be / Contacted for		
	Student Internship	Student Final Placement	Faculty Internship
Advancetech Controls Private Limited	Yes		
Embedded Technology Labs	Yes		
L&T Tech Services, Bldg A1 Mindspace, Airoli		Yes	
Robosoft Systems	Yes		

4.g **Identify suitable relevant TOP Guest Speakers from Industry**
(CS50 Lecture by Mark Zuckerberg - 7 December 2005 - YouTube)

Name of the Identified Guest Speaker	Designation	Name of the Company
Christopher J.	Head - Technology Solutions & Initiatives	Tata Consultancy Services

4.h **Identify relevant Technical competitions to participate [Competitions -Paper Presentations, Projects, Hackathons, IVs etc..]**

Name of the Relevant Technical Competition Identified to participate	Organized by	Date of the Event
Techfest	IIT Bombay	27-29 December 2023
TechVista	VSIT	February 2023

4.i **Identify faculty in TOP schools / Universities who are teaching same / similar subject and develop rapport e.g. Exchange Lecture Material (Assignments / Tests / Project etc..), Joint Paper Publication**

University	Name of the Course	Name of Faculty	Type of Collaboration		
			Exchange of Lecture Material	Joint Publication/ Research	Other
IIT Bombay					

4.j **Module Best Available in - <u>Title</u> best resource [from *<u>4.a</u>* to *<u>4.d</u>* in this AAP] & give details**

Module No.	Title of the Module	Web Link	Mention the Tile			
			Journal	E-Journal	Magazine	Other Resource
1	PIC microcontroller, Advanced ARM Controllers	https://groups.csail.mit.edu/lbr/stack/pic/pic-microcontrollers.pdf				MIT - Massachusetts Institute of Technology

2	Communication Protocol & Implementation	https://embeddedsecurity.io/protocols		Embedded Systems Security and TrustZone		
3	Getting Started with Arduino, Basic Functions:	https://www.arduino.cc/reference/en/				Arduino SSO
4	Using Sensors with the Arduino, Electromechanical Control Using the Arduino	https://www.arduino.cc/reference/en/				Arduino SSO
5	Wireless Control Using the Arduino, Case Studies	https://www.mdpi.com/2673-4052/3/4/29	MDPI			

4.k **Referred to any top-rated university in that subject for content**

University	Name of the Course	Name of Faculty	Date of Delivery of the Course	Remarks

4.l **Faculty received any certification related to this subject. List of Certifications Identified / Done**

Course	Certifying Agency	No. of Hours	Level of the Course		Certification		Remarks
			Introductory	Advance Skill Development	Done on	Proposed to be on	

4.m **Completed subject wise/cluster wise training with cluster mentor.**
List of relevant Refresher Course Identified / Done

Course	Certifying Agency (As suggested by DAB/Cluster Mentor/Industry/ University other than MU)	Certification		Remarks
		Done on	Proposed to be on	
Pedagogy				
PBL				

Sub. Content Training				

4.n Best Practices Identified and adopted

No.	Item	Best Practices Identified		
		Univ. 1	Univ. 2	Univ. 3
1	Microsite			
2	Video Lectures			
3	Assignments			
4	Mini Project			
5	Assessment Metric			
6	Quizzes			
7	Labs/ Practical (PBL)			
8	Tests			
9	Peer Assessment			
10	Any Other			

4.o Web Links for Online Notes/YouTube/VSIT Digital Content/VSIT Lecture Capture/NPTEL Videos

Students can view lectures by VSIT professors, captured through LMS 'Lecture Capture' in VSIT campus for previous years.

No.	Websites / Links	Module Nos.
1	PIC Microcontrollers- https://www.youtube.com/watch?v=4UQ2_GodgoE&list=PLMkXE_yS8mSyEWxnLfI53Aw-Vpo1CxiNA	1
2	ARM- Swayam- https://www.youtube.com/watch?v=3OmyM4-zuQw	1
3	How CPU works? ARM Vs Intel https://www.youtube.com/watch?v=vqs_0W-MSB0	2
4	Communication Protocols - https://www.youtube.com/watch?v=bdgCFkc_RXY	2
5	Embedded Systems Lecture Series - https://www.youtube.com/playlist?list=PL84637AA7125111CB	All
6	Arduino Course for Beginners- https://www.youtube.com/watch?v=zJ-LqeX_fLU	3
7	Embedded Systems project - https://www.electronicshub.org/	5
8	Embedded Systems project - https://people.ece.cornell.edu/land/courses/ece4760/FinalProjects/#f2015	5
9	Introduction to sensors and transducers- https://www.youtube.com/watch?v=gPosu0j9ZUQ	4,5
10	Watch dog Timer Role play you-tube video	5

	https://www.youtube.com/watch?v=N-93WqQTlxs	

4.p Recommended MOOC Courses like Coursera / NPTEL / MIT-OCW / edX/VAC etc.

Sr. No.	MOOC Course Link	Course conducted by – Person / University / Institute / Industry	Course Duration	Certificate (Y / N)
1	Introduction to Embedded Systems software and Development Environments	University of Colorado Boulder	4 weeks	Y (Paid)
2	The Arduino Platform and C Programming https://www.coursera.org/learn/arduino-platform	Coursera	4 weeks	Y (Free)
3	Embedded Systems Programming in C++ https://barrgroup.com/EmbeddedSystems/Training-Courses/cplusplus-programming#a1---- Training	BARR group	4 Days	Y (Paid)
4	Embedded Systems in IOT	ATS	32 Hrs	Y

5 Consolidated Course Lesson Plan

	From (date/month/year)	From (date/month/year)	Total Number of Weeks
Semester Duration	28/11/2023		15

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
1	1	3	Subject Introduction				Shibu KV Ch.1 pg. 4
	2	3	Introduction to Arduino				Shibu KV Ch.1 pg. 4-8
	3	3	Arduino Variants				Shibu KV Ch.1 pg. 21-23
	4	3	Arduino IDE Basics				Shibu KV Ch.1 pg. 21-23
	5	3	Arduino Functions: Overview Structure, Digital I/O Functions, Analog I/O Functions,				Shibu KV Ch.1 pg. 21-23

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
2	6	3	Advanced Arduino Functions: Advanced I/O Functions, Timer Functions, Communication Functions, Interrupt Functions				Shibu KV Ch.1 pg. 26
	SS	3	Advanced Arduino Functions: Math Functions				Shibu KV Ch.1 pg. 26-28
	7	3	Programming Language Reference				Shibu KV Ch.1 pg. 35-44
	8	3	**Viva/Activity Based on Unit 3**				Shibu KV Ch.1 pg. 45-60
	9	3	**Viva/Activity Based on Unit 3**				Shibu KV Ch.1 pg. 60-64
3	10	4	Light Sensitive Sensors, Temperature Sensors, Temperature and Humidity Sensor				Shibu KV Ch.2 pg. 72-74
	11	4	Line-Tracking Sensor, Ultrasonic Sensors,				Shibu KV Ch.2 pg. 74-79
	12	4	Digital Infrared Motion Sensor, Joystick Module, Gas Sensor				
	13	4	Hall Sensor, Colour Sensor, Digital Tilt Sensor				
4	14	4	Triple Axis Acceleration Sensor, Analog Sound Sensor				Shibu KV Ch.2 pg. 81-87
	15	4	Voice Recognition Module, Digital Vibration Sensor				M. Barr Ch.5 pg. 43-53

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
	SS	4	Flame Sensor, Capacitive Touch Sensor				M. Barr Ch.5 pg. 43-53
	16	4	Electromechanical Control Using the Arduino: DC Motor, Stepper Motor, Servo Motor				M. Barr Ch.5 pg. 43-53
	17	4	**Viva/Activity Based on Unit 4**				M. Barr Ch.5 pg. 43-53
	18	4	**Viva/Activity Based on Unit 4**				M. Barr Ch.5 pg. 43-53
5	19	5	Wireless Control Using the Arduino: Infrared Transmitter and Receiver				M. Barr Ch.5 pg. 43-53
	20	5	Wireless Radio Frequency				Shibu KV Ch.2 pg. 81-87
	21	5	Bluetooth, GSM/GPRS				
	22	5	Wi-Fi Communication Case Studies: • Air Quality Monitor Using Arduino				
6	SS	5	Case Studies: • A Fire-Fighting Robot Using Arduino • Intelligent Lock System Using Arduino				Mazidi Ch.1 pg. 20 -22

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
	23	5	**Viva/Activity Based on Unit 5**				Mazidi Ch.1 pg. 23 -26
	24	5	**Viva/Activity Based on Unit 5**				Mazidi Ch.1 pg. 26 -28
	25	1	PIC MICROCONTROLLER: Architecture –				Mazidi Ch.1 pg. 28 -29
7	26	1	PIC– memory organization and addressing modes				Mazidi Ch.1 pg. 20 -22
	27	1	PIC – instruction set – programming in Assembly & C –I/O port, Data Conversion				Rajkamal Ch.2 pg.66,67,68
	28	1	PIC– programming in C –I/O port, Data Conversion				Mazidi Ch.7 pg.154 -159
	29	1	PIC RAM & ROM Allocation				Mazidi Ch.7 pg.160-165
8	30	1	Timer programming				Mazidi Ch.7 pg.165-168
	31	1	Advanced ARM Controllers: Introduction to ARM and its Features				Mazidi Ch.7 pg.169-173
	32	1	ARM Architecture – memory organization – addressing modes				Rajkamal Ch.2 pg.66,67,68
	33	1	The ARM Programmer's model -Registers				Mazidi Ch.7 pg.154 -159
	SS	1	Pipeline - Interrupts				

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
	34	1	ARM – Coprocessors – Interrupt Structure				
9	35	1	**Viva/Activity Based on Unit 1**				Shibu KV Ch.5 pg.94-105
	36	1	**Viva/Activity Based on Unit 1**				Shibu KV Ch.5 pg.105-111
	37	2	Communication Protocol & Implementation: Introduction to Communication Protocol				Shibu KV Ch.5 pg.105-111
	38	2	I2C - Interfacing with micro controller using bit-banking method				M. Barr Ch.3 pg.19-21
	39	2	I2C - Interfacing with micro controller using bit-banking method				M. Barr Ch.2 pg.18,
10	40	2	I2C devices – RTC,				M. Barr Ch.3 pg. 21-25
	41	2	Memory, ADC-DAC,				M. Barr Ch.4 pg. 30-35
	SS	2	Port Expander, SPI (Serial Peripheral Interface),				Shibu KV Ch.5 pg.93-94
	SS	2	Bluetooth, Wi-Fi and RFID.				
		2	Understanding Serial, Communication,				
11	42	2	Bluetooth Communication,				Shibu KV Ch.10 pg.382-384

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
	43	2	SPI Interface ZigBee, Wi-Fi,				Shibu KV Ch.10 pg.384-386
	44	2	I2C, Infrared,				Shibu KV Ch.10 pg.386-390
	45	2	RFID, GSM, GPS,				M. Barr Ch.2 pg.119-123
	46	2	PDH/SDH/Ethernet				Shibu KV Ch.13 pg.557-558
	47	5	Revision				Shibu KV Ch.13 pg.558-597
12	48	5	Revision				Shibu KV Ch.13 pg.597-603
	49	2	**Viva/Activity Based on Unit 2**				Shibu KV Ch.13 pg.597-603
	50	2	**Viva/Activity Based on Unit 2**				Shibu KV Ch.15 pg. 622-636

6 Rubric for Grading and Marking of Term Work (inform students at the beginning of semester)

Lecture + Practical (% of class participation) & Marks	Assign-ments	Tutorial	Lab / Practical Performance	Lab Journal Assessment	Class Tests (Other than IA)	Other (1) specify	Other (2) specify	Total
Active Participation (10)	3 assignments		Practical Submission (100) Scaled down to 20		5 Test on each unit (10 marks)			30 marks

7 Assignments / Tutorials Details

Assignment/ Tutorial No.	Title of the Assignments / Tutorials	CO Map	Assignment/ Tutorials given to Students on	Week of Submission
1	Collaborative Group Activity	CO1	4rd week	5th week
2	Arduino and sensors	CO3	9th week	10th week
3	Case Study Presentation	CO5	11th week	12th week

Analysis of Assignment / Tutorial Questions and Related Resources

Assignment / Tutorial No.	Week No.	Type* (√)			Module No.	Based on #			Question Type (√)	
		R	PQ	OBT		Text Book	Reference Book	Other Learning Resource	MU EQ	Thought Provoking
1	3		√		1	√	1	-	√	√
2	5		√		2	√	1,2	-	√	√
3	8		√		3	√	1,2	-	√	√

* Tick (√) the Type of the Assignment: Regular (R); Pop Quiz (PQ) ; Open Book Test for TE/BE/ME (OBT)
# Write number for text book, reference book, other learning resource from this AAP – *from Points 4.a to 4.d*

8 Internal Assessment / Other Class Test / Open Book Test (OBT)/Take Home Test (THT) Details

Tests	Test Dates	Module No.	CO Map	IA Question Paper Pattern	Policy
1st IA Test	Week 6	1 & 2		IA 1 (MCQ) 30 marks (scaled to 7.5) IA 2 (MCQ) 30 marks (scaled to 7.5)	No IA Re-test IA is a Head of passing *
2nd IA Test	Week 12				
Pop Quiz	Week 9	1			
Open Book Test	Week 11	1,2			
Take Home Test	Week 12	All		Important EQ to be solved	
Class tests / prelims	Week 12	All		Based on different block diagrams	

Class tests / prelims					
Any other test/exams					

*** Failures of IA test (IA1+IA2) shall appear for IA test in the next semester. There is no provision for re-test in the same semester.**

9.a Practical Activities

Practical No.	Module No.	Title of the **Experiments**	Type of Experiment		Topics to be highlighted	CO Map
			PBL	Newly Added		
1	3	Introduction to Arduino- Introduction to Arduino circuits and breadboarding, Blinking of LEDs			Introduction to Arduino IDE	3
2	3, 4,5	Program using Light Sensitive Sensors			Interfacing sensors	3, 4,5
3	3, 4, 5	Program using temperature sensors			Interfacing sensors	3, 4,5
4	3, 4, 5	Programs using humidity sensors			Interfacing sensors	3, 4,5
5	3, 4, 5	Programs using Line tracking sensors			Interfacing sensors	3, 4,5
6	3, 4, 5	Programs using Ultrasonic Sensors			Interfacing sensors	3, 4,5
7	3, 4, 5	Programs using digital infrared motion sensors			Interfacing sensors	3, 4,5
8	3, 4,5	Programs using gas sensors			Interfacing sensors	3, 4,5
9	3, 4,5	Programs using servo motors			Interfacing sensors and Actuators	3, 4,5
10	3, 4,5	Programs making Joystick with Arduino			Interfacing sensors and Actuators	3, 4,5

10 Beyond Syllabus Activities for Gap Mitigation

No.	Type of the Activity	Activities	Number of beneficiaries	Other Details – guest profile, feedback, mark sheet, report
1	**Experiential learning/Interaction with Outside World**	1- Guest Lectures by Industry Expert		
		2- Workshops		
		3- Mini Project		Yes
		4- Industrial Visit		

		5- Any other activity		
2	**Collaborative & Group Activity**	6- Poster Presentation		
		7- Minute Papers		
		8- Students Seminars		Yes
		9- Students Debates		
		10- Panel Discussion / Mock GD		
		11- Mock Interview		
		12- Any other activity		
3	**Co-Curricular Activity**	13- Informative videos (NPTEL/Youtube /TEDx/ MIT OW/edX)		Yes
		14- Lecture Capture Usage		Yes
		15- Any other activity		
4	**Tests & Assessments**	16- Class Tests/ Weekly Tests		Yes
		17- Pop Quiz		Based on Unit 1
		18- Mobile App Based Quiz		
		19- Open Book Test		Based on unit 1 and unit 2
		20- Take Home Test		Based on Self Study Topics
		21- Any other activity		

11.1 One-on-One Academic Mentoring Meetings done

No.	Name of Mentee	Date of One-On-One Meeting		
		Beginning of Sem.	After Mid Term Results	Before End Sem.

11.2 Identify concerns and refer appropriately

No.	Name of Mentee	Action Taken		
		Individual Goals Identified	Any Financial Concern which needs to be referred to	Any Emotional Concern to be referred to

*** Do not delete any activity. Give details for planned events. Write 'NA' for activity Not Planned.**

Consolidated Academic Administration Plan Prepared by (mention all theory teaching faculty names with signature)

Please write below your name and sign with date of the external cluster mentor meeting

Faculty 1	Faculty 2	Faculty 3

External Industry Mentor	External Academic Mentor	VSIT Cluster Mentor	Program HOD

The academic resources available in VSIT –

VMIS (ERP)	V-Refer and V-Live	VSIT Library	VAC & MOOC Courses
Institute & Department Vision and Mission	Former IA question papers and solutions (prepared by faculty)	Former IA question papers solutions - hardcopy	Value Added Courses (VAC) are conducted throughout the semester & in the semester break - Enrol for the VACs
Program Educational Objectives (PEO)	MU end semester examination question papers and solutions (prepared by faculty)	MU end semester exam question paper & solutions - by faculty, hardcopy	
Program Specific Outcome (PSO)	Class notes and Digital Content for the subject (scanned / typed by faculty)	All text books, reference books, e -books mentioned in the syllabus & AAP	Online courses from NPTEL, Coursera etc. are pursued throughout the semester - Register for the course & get certified
Program Outcome (PO)	Comprehensive question bank, EQ, GQ, PPT, Class Test papers	Technical journals and magazines for reference	
Departmental Knowledge Map	Academic Administration Plan & Beyond Syllabus Activity report	VSIT library is member of IIT Bombay Library	Watch former lectures captured in LMS at VSIT

1.a Course Objectives (Write in detail – as per NBA guidelines)

Cognitive	What do you want students to know?	To gain knowledge about basics and working of Internet of Things devices. Develop embedded programs for Internet of Things devices on Raspberry Pi and Arduino.
Affective	What do you want students to think / care about?	To understand the design and working of various Internet of Things devices and how can one create a prototype and then move into mass production keeping in mind various business models.
Behavioural	What do you want students to be able to do?	To design programs for Internet of Things devices using Raspberry Pi and Arduino.

Advice to Students:

Attend every class!!! Missing even one class can have a substantial effect on your ability to understand the course. Be prepared to think and concentrate, in the class and outside. I will try to make the class very interactive. Participate in the class discussions. Ask questions when you don't understand something. Keep up with the class readings. Start assignments and homework early. Meet me in office hour to discuss ideas, solutions or to check if what you understand is correct.

Collaboration Policy:

We encourage discussion between students regarding the course material. However, no discussion of any sort is allowed with anyone on the assignment and homework for the class. If you find solution to some problems in a book or on the internet, you may use their idea for the solution; provided you acknowledge the source (name and page in the book or the website, if the idea is found on the internet). Even though you are allowed to use ideas from another source, you must write the solution in your own words. If you are unsure whether or not certain kinds of collaboration is possible, please ask the teacher.

1.b Course Outcome (CO) Statements and Module-Wise Mapping (follow NBA guideline)

CO No.	Statements	Related Module/s
CO1	Describe what IoT is and how it works today and Recognise the factors that contributed to the emergence of IoT.	Unit 1
CO2	Design and program IoT devices and Use real IoT protocols for communication.	Unit 2
PCO3	Secure the elements of an IoT device.	Unit 3
CO4	Design an IoT device to work with a Cloud Computing infrastructure.	Unit 4
CO5	Transfer IoT data to the cloud and in between cloud providers and Define the infrastructure for supporting IoT deployments	Unit 5

1.c Mapping of COs with POs (mark S: Strong, M: Moderate, W: Weak, Dash '–': not mapped) (List of POs is available in V-refer)

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

1.d Mapping of COs with PSOs (mark S: Strong, M: Moderate, W: Weak, Dash '–':not mapped)

	PSO 1	PSO 2	PSO 3	PSO 4
CO 1				
CO 2				
CO 3				
CO 4				
CO 5				

1.e Teaching and Examination Scheme (As specified by the University) for the Course

Categories	Humanities and Social Sciences	Basic Science	Engineering Science	Professional Core	General Education	Professional Elective	Project/ Internship	Open Elective
Tick suitable category			✓					

Subject Code	Subject Name	Teaching Scheme			Credits Assigned			
		Theory	Practical	Tutorial	Theory	TW/Practical	Tutorial	Total
USIT502	Internet of Things	75+25	-		2	-		2
USIT5P2	Internet of Things	-	50		-	2		2

Subject Code	Subject Name	Examination Scheme						
		Theory Marks IA Test		End Sem. Exam Marks	TW	Practical	Oral	Total
		IA	Average of IA1 and IA2					
USIT502	Internet of Things	20+20 Marks (Scaled down to 15)	15	75	10	-		100
USIT5P2	Internet of Things					50		50

1.f **Faculty-Wise Distribution of all Lecture-Practical-Tutorial Hours for the Course**

Divisions	Lecture (Hrs.)	Practical (Hrs.)				Tutorial (Hrs.)			
		Batch 1	Batch 2	Batch 3	Batch 4	Batch 1	Batch 2	Batch 3	Batch 4
Div A	4	2	2	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

1.g **Office Hours (Faculty will be available in office in this duration for solving students' query)**

Division	Day	Time (at least 1 Hr. / Division)	Venue (Office Room No.)
Div A	Wednesday	3:00 pm -4:00 pm	X-115
Div B			
Div C			
Div D			
Div E			

2.a **Syllabus: Module Wise Teaching Hours and % Weightage in University Question Paper**

Module No.	Module Title and Brief Details	Teaching Hrs. for each module	% Weightage in University Question Papers

1	Design Principles for Connected Devices, Internet Principles	10 lectures x 1 hour	20
2	Prototyping Embedded Devices	10 lectures x 1 hour	20
3	Prototyping the Physical Design and online components	10 lectures x 1 hour	20
4	Techniques for Writing Embedded Code, Business Models	10 lectures x 1 hour	20
5	Moving to Manufacture, Ethics	10 lectures x 1 hour	20
Total		**50 hrs**	**100 %**

2.b Prerequisite Courses

No.	Semester	Name of the Course	Topic/s
1	12 Std	Mathematics	Logic and Boolean Expression
2	1	Introduction to Programming	Operators, Expressions, Arrays, Pointers

2.c Relevance to Future Courses

No.	Semester	Name of the Course
1	TY.BSc.DS Sem VI	Project

2.d Identify real life scenarios/examples which uses the knowledge of the subject (Discussion on how to prepare examples and case studies e.g. "Boeing Plane": C Programming Language – Intro to Computer Science – Harvard's CS50 (2018) – Bing video)

Real Life Scenario	Concept Used
Smart Home Automation : (1) AWESOME Apple Smart Home Automation 😍 🏠 📱 - YouTube	Sensor networks, actuators, home automation protocols.
Industrial Monitoring and Control: (1) IoT Based Industrial Monitoring and Controlling System - YouTube	Industrial IoT (IIoT), sensors, cloud computing.
Smart Agriculture: (1) IoT in Agriculture : Smart Farming #short #shorts #viral - YouTube	sensors, actuators, and drones
Healthcare Monitoring: (1) Manage your Health with Remote Patient Monitoring | NextGen Healthcare - YouTube	Wearable devices, telemedicine, data analytics.

3 Past Results – Division-Wise

Details	Target – May 2024	May 2022	May 2021	May 2020
Course Passing %	90 %	NA	NA	NA
Marks Obtained by Course Topper (mark/100)	85	NA	NA	NA

	Div A		Div B		Div C		Div D	
Year	Initials of Teacher	% Result	Initials of Teacher	% Result	Initials of Teacher	% Result	Initials of Teacher	% Result
Dec 2022	NA	NA	NA	NA	NA	NA	NA	NA
Dec 2021	NA	NA	NA	NA	NA	NA	NA	NA
Dec 2020	NA	NA	NA	NA	NA	NA	NA	NA

4 All the Learning Resources – Books and E-Resources

4.a List of Text Books (T – Symbol for Text Books) to be Referred by Students

Sr. No	Text Book Titles	Author/s	Publisher	Edition	Module Nos.
1	Designing the Internet of Things	Adrian McEwen, Hakim Cassimally	Wiley	First	1, 2, 3, 4, 5

4.b List of Reference Books (R – Symbol for Reference Books) to be Referred by Students

Sr. No	Reference Book Titles	Author/s	Publisher	Edition	Module Nos.
1	Designing the Internet of Things	Adrian McEwen, Hakim Cassimally	Wiley	First	1, 2, 3, 4, 5
2	Internet of Things - Architecture and Design	Rajkamal	McGraw Hill	First	1, 2, 4

4.c List of E - Books (E – Symbol for E-Books) to be Referred by Students

Sr. No	E- Book Titles	Author/s	Publisher	Edition	Module Nos.
1	Getting Started with the Internet of Things	Cuno Pfister	O'Reilly	Sixth	1
2	Getting Started with Raspberry Pi	Matt Richardson and Shawn Wallace	SPD	Third	3

4.d **Reading latest / top rated research papers (at least 5 papers)**

Name of Paper	Name of Authors (Background)	Published in		Problem Statement
		Date	Journal	
A Survey on Internet of things architectures	Zulfiya Boboyeva*, Rakhmonali Sokhibov, Ibrohim Yuldashev and Abdusalom Ma'murov	19 July 2023	International Scientific Siberian Transport Forum - TransSiberia 2023	In order to facilitate the scalability and extensibility of multimodal sensor data and data technologies, an open culture architecture has been studied. Scalability and situationally customizable datalogger and service also identify the idea underlying virtual detectors and artificial instruments to feed data constantly or sporadically. An IoT architecture concept with three layers is provided.
Secure and Efficient Data Transmission in IoT Networks: Addressing the Challenges of Privacy and Energy Consumption	Fagen Li, Zhaohui Zheng & Chunhua Jin	21 November 2022	Springer	It is critical to establish a secure channel between the sensors and servers in order to ensure the correctness of collected data. If the collected data is tampered, the results of data analysis is unbelievable, and may even bring serious disaster.
IoT based Smart Applications and Recent Research Trends	Ishita Seth, Surya Narayan Panda, Kalpna Guleria Chitkara University, Punjab, India	07-09 October 2021	6th International Conference on Signal Processing, Computing and Control (ISPCC)	recent research trends in this technology
Machine Learning Framework for Intelligent Detection of Wastewater Pollution by IoT-Based Spectral Technology	Jianhong Li, Ken Cai,	03 Aug 2021	Wireless Communications and Mobile Computing	Near-infrared (NIR) spectroscopy in Wastewater Pollution
A Cloud Based Conceptual IdentityManagement Model for Secured Internetof Things Operation	Abubakar Bello, V. Mahadevan	July 2019	Journal of Cyber Security and Mobility	How identity management for IoT is likely to play out in a world where the Internet and cloud technologies are expected to take center stage in the running of day-to-day activities is examined.

4.e **Based on research paper an identify the current Problem statement**

Problem Statement		Used in

	Quiz	Assignment	Lab	Mini Project	Poster Presentation	Test	Any Other
What are the possible privacy issues in sending data on Network?		Yes—Paper 2					
Recent research trends in this technology					Yes—Paper 1 and 3		
Near-infrared (NIR) spectroscopy in Wastewater Pollution				Yes---Paper 4 and 5			

4.f **Identify Companies / Industries which use the knowledge of the subject and thus may provide Internships and final Placements**

Name of the Company	To be / Contacted for		
	Student Internship	Student Final Placement	Faculty Internship
Tata Consultancy Services (TCS)		Yes	
Tech Mahindra		Yes	
Wipro		Yes	
L&T Infotech		Yes	
IBM India		Yes	

4.g **Identify suitable relevant TOP Guest Speakers from Industry (CS50 Lecture by Mark Zuckerberg - 7 December 2005 - YouTube)**

Name of the Identified Guest Speaker	Designation	Name of the Company
Chetan Sharma: (1) 5GNext with Sarita Rao and Stella Medlicott. Hosted by Chetan Sharma Consulting. - YouTube	IoT analyst and consultant	Chetan Sharma Consulting

4.h **Identify relevant Technical competitions to participate [Competitions -Paper Presentations, Projects, Hackathons, IVs etc..]**

Name of the Relevant Technical Competition Identified to participate	Organized by	Date of the Event
Techfest	IIT Bombay	December

4.i **Identify faculty in TOP schools / Universities who are teaching same / similar subject and develop rapport e.g. Exchange Lecture Material (Assignments / Tests / Project etc..), Joint Paper Publication**

University	Name of the Course	Name of Faculty	Type of Collaboration		
			Exchange of Lecture Material	Joint Publication/ Research	Other
IIT Bombay	Computer Science &	Kavi Arya			

	Engineering Dept				

4.j **Module Best Available in - Title best resource [from *4.a* to *4.d* in this AAP] & give details**

Module No.	Title of the Module	Web Link	Mention the Tile			
			Journal	E-Journal	Magazine	Other Resource
1	Design Principles for Connected Devices, Internet Principles	IEEE Internet of Things Magazine: IEEE Xplore: IEEE Internet of Things Magazine			√	
2	Prototyping Embedded Devices	International Journal of Embedded Systems": International Journal of Embedded Systems (IJES) Inderscience Publishers - linking academia, business and industry through research		√		
3	Prototyping the Physical Design and online components	Physical Design: https://www.oreilly.com/content/prototyping-physical-digital-products/	√			
4	Techniques for Writing Embedded Code, Business Models	Journal of Business Models: Journal of Business Models		√		
5	Moving to Manufacture, Ethics	Manufacturing Today: Latest News on Manufacturing Industry & Production in India | Manufacturing Today India			√	

4.k **Referred to any top-rated university in that subject for content**

University	Name of the Course	Name of Faculty	Date of Delivery of the Course	Remarks
Indian Institute of Technology (IIT) Bombay	EE 6103 – Advanced Network Security	Prof. Sudip Misra	22 January 2024	

4.l **Faculty received any certification related to this subject. List of Certifications Identified / Done**

Course	Certifying Agency	No. of Hours	Level of the Course		Certification		Remarks
			Introductory	Advance Skill Development	Done on	Proposed to be on	
FDP on Arduino	IIT Bombay	30	Yes		from 2018-09-01 to 2018-12-31		

4.m **Completed subject wise/cluster wise training with cluster mentor.**
List of relevant Refresher Course Identified / Done

Course	Certifying Agency (As suggested by DAB/Cluster Mentor/Industry /University other than MU)	Certification		Remarks
		Done on	Proposed to be on	
Pedagogy	Bringing Learners Centricity to Teaching Learning Process	22nd January 2022		Blended learning, teaching methodologies and pedagogy to engage students
PBL				
Sub. Content Training	FDP on Advance Technologies in IT	9th May to 12th May 2020		Online Hands-on FDP on Electronics and IOT

4.n **Best Practices Identified and adopted**

No.	Item	Best Practices Identified		
		Indian Institute of Technology (IIT) Bombay	National Institute of Technology (NIT) Trichy	Indian Institute of Science (IISc), Bangalore
1	Microsite			√
2	Video Lectures	√		
3	Assignments	√		
4	Mini Project	√		√
5	Assessment Metric		√	
6	Quizzes	√		√
7	Labs/ Practical (PBL)		√	
8	Tests	√		√
9	Peer Assessment			
10	Any Other			

4.o **Web Links for Online Notes/YouTube/VSIT Digital Content/VSIT Lecture Capture/NPTEL Videos**

Students can view lectures by VSIT professors, captured through LMS 'Lecture Capture' in VSIT campus for previous years.

No.	Websites / Links	Module Nos.
1	Digital Content (live.vsit.edu.in)	1-5
2	IoT Training Edureka : https://www.youtube.com/watch?v=LlhmzVL5bm8&list=PL9ooVrP1hQOGccfBbP5tJWZ1hv5sIUWJl	1,2 &3

3	IoT Wyliodrin https://www.youtube.com/watch?v=G4-CtKkrOmc&list=PLHih6DnKQaoYQ5PIT3Tp-UrqUguDYWYQu	1,2 &3
4	Business Model Canvas https://www.youtube.com/watch?v=CakUeC1sCSs	4
5	IoT manufacturing https://www.youtube.com/watch?v=u3IaXvjDiOE	5
6	Challenges in IoT Manufacturing https://www.youtube.com/watch?v=l4L5CDrHywQ	5
7	IoT Testing https://www.youtube.com/watch?v=E8V3sGylWKQ	5

4.p **Recommended MOOC Courses like Coursera / NPTEL / MIT-OCW / edX/VAC etc.**

Sr. No.	MOOC Course Link	Course conducted by – Person / University / Institute / Industry	Course Duration	Certificate (Y / N)
1	IoT Tutorial For Beginners: (1) IoT Full Course - Learn IoT In 4 Hours | Internet Of Things | IoT Tutorial For Beginners | Edureka - YouTube	Edureka	4 hours	Y
2	Introduction to Internet of Things - https://nptel.ac.in/courses/106105166/	NPTEL – IIT Kharagpur	12 Weeks	Y
3	Introduction to Industry 4.0 and Industrial Internet of Things - https://nptel.ac.in/courses/106/105/106105195/	Prof. Sudip Misra	12 Weeks	Y

5 Consolidated Course Lesson Plan

	From (date/month/year)	To (date/month/year)	Total Number of Weeks
Semester Duration	June	October	15

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered.	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
1	1	1	The Flavour of Internet of Things, The Technology of Internet of Things		CO1	1	DIoT – Chapter 1, Page 8, 12
	2	1	The "Internet" of "Things", Enchanted Objects, who is making Internet of Things?		CO1	2	DIoT – Chapter 1, Page 9, 16, 17
	3	1	Design Principles - Calm & Ambient Technology, Magic as Metaphor, Privacy, Keeping Secrets		CO1	3	DIoT – Chapter 2, Page 21, 27
	4	1	Whose data is it anyway? Web Thinking for Connected Devices, Small Pieces, Loosely Joined, First-Class Citizens on The Internet		CO1	4	DIoT – Chapter 2, Page 33, 34, 36
2	5	1	Web Thinking for Connected Devices		CO1	5	DIoT – Chapter 2, Page 37,38
	6	1	Internet Communications: An Overview, IP, TCP, The IP Protocol Suite (TCP/IP), UDP, IP Addresses		CO1	6	DIoT – Chapter 3, Page 41, 45
	SS	1	DNS, Static IP Address Assignment, Dynamic IP Address Assignment		CO1		DIoT – Chapter 3, Page 50

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered.	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
	7	1	IPv6, MAC Addresses, TCP and UDP Ports, An Example: HTTP Ports, Other Common Ports,		CO1	7	DIoT – Chapter 3, Page 52
	8	1	Application Layer Protocols, HTTP, HTTPS: Encrypted HTTP		CO1	8	DIoT – Chapter 3, Page 52,53
3	9	1	Other Application Layer Protocols		CO1	9	DIoT – Chapter 3, Page 60
	10	1	Viva/ Students' Activity on module 1		CO1	10	
	11	2	Sketching, Familiarity, Costs versus Ease of Prototyping, Prototypes and Production,		CO2	11	DIoT – Chapter 4, Page 63-65
	12	2	Changing Embedded Platform		CO2	12	DIoT – Chapter 4, Page 65-72
4	13	2	Physical Prototypes and Mass Personalization, Climbing into the Cloud		CO2	13	DIoT – Chapter 4, Page 73
	14	2	Open Source versus Closed Source, Why Closed? Why Open? Mixing Open and Closed Source,		CO2	14	DIoT – Chapter 4, Page75-80
	15	2	Closed Source for Mass Market Projects, Tapping into the Community		CO2	14	DIoT – Chapter 4, Page 80-84

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered.	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
	SS	2	Electronics, Scaling up Electronic, Embedded Computing Basics, MUC, SOC		CO2		DIoT – Chapter 5, Page 87
	16	2	Choosing Your Platform, Arduino, Developing on Arduino, Some Notes on Hardware, Openness		CO2	16	DIoT – Chapter 5, Page 96
5	17	2	Raspberry Pi, Cases and Extension Boards, Developing on Raspberry Pi, Some Notes on Hardware, Openness		CO2	17	DIoT – Chapter 5, Page 111
	18	2	BeagleBone Black, Cases and Extension Boards, Developing on BeagleBone Black, Some Notes on Hardware, Openness		CO2	18	DIoT – Chapter 5, Page 122
	19	2	Electric Imp, Developing on Electric Imp, Some Notes on Hardware, Openness		CO2	19	DIoT – Chapter 5, Page 130
	20	2	Viva/ Students' Activity on module 2		CO2	20	
6	21	3	Preparation, Sketch, Iterate, and Explore, Nondigital Methods		CO3	21	DIoT – Chapter 6, Page 147
	22	3	Laser Cutting, Choosing a Laser Cutter, Software, Hinges and Joints		CO3	22	DIoT – Chapter 6, Page 154
	23	3	3D Printing, Types of 3D Printing, Software, CNC Milling, Repurposing/Recycling		CO3	23	DIoT – Chapter 6, Page 161

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered.	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
	24	3	Getting Started with an API, Mashing Up APIs, Scraping		CO3	20	DIoT – Chapter 7, Page 173
7	25	3	Legalities, Writing a New API, Clockodillo, Security		CO3	25	DIoT – Chapter 7, Page 176, 178
	26	3	Implementing the API, Using Curl to Test		CO3	26	DIoT – Chapter 7, Page 183
	27	3	Going Further, Real-Time Reactions		CO3	27	DIoT – Chapter 7, Page 194
	28	3	Polling, Comet, Other Protocols		CO3	28	DIoT – Chapter 7, Page 199
	SS	3	MQ Telemetry Transport, Extensible Messaging and Presence Protocol,		CO3		DIoT – Chapter 7, Page 202
8	29	3	Constrained Application Protocol.		CO3	29	DIoT – Chapter 7, Page 203
	30	3	Viva/ Students' Activity on module 3		CO3	30	
	SS	4	Memory Management, Types of Memory		CO4		DIoT – Chapter 8, Page 205

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered.	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
	31	4	Making the Most of Your RAM, Performance and Battery Life, Libraries, Debugging		CO4	31	DIoT – Chapter 8, Page 208
	32	4	A Short History of Business Models,		CO4	32	DIoT – Chapter 9, Page 227
9	33	4	Space and Time, From Craft to Mass Production,		CO4	33	DIoT – Chapter 9, Page 229
	34	4	The Long Tail of the Internet, Learning from History		CO4	34	DIoT – Chapter 9, Page 231
	35	4	The Business Model Canvas, Who Is the Business Model For?		CO4	35	DIoT – Chapter 9, Page 233
	36	4	Models, Make Thing, Sell Thing, Subscriptions,		CO4	36	DIoT – Chapter 9, Page 238
10	37	4	Customisation, Be a Key Resource, Provide Infrastructure: Sensor Networks, Take a Percentage		CO4	37	DIoT – Chapter 9, Page 240
	38	4	Funding an Internet of Things Startup, Hobby Projects and Open Source		CO4	38	DIoT – Chapter 9, Page 243
	39	4	Venture Capital, Government Funding, Crowdfunding, Lean Startups		CO4	39	DIoT – Chapter 9, Page 245

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered.	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
	40	4	Viva/ Students' Activity on module 4		CO4	40	
11	41	5	What Are You Producing? Designing Kits		CO5	41	DIoT – Chapter 10, Page 255
	42	5	Designing Printed circuit board		CO5	42	DIoT – Chapter 10, Page 260
	43	5	Software Choices, The Design Process		CO5	43	DIoT – Chapter 10, Page 265
	44	5	Manufacturing Printed Circuit Boards, Etching Boards		CO5	44	DIoT – Chapter 10, Page 267
12	45	5	Milling Boards, Assembly, Testing, Mass-Producing the Case and Other Fixtures		CO5	45	DIoT – Chapter 10, Page 270
	46	5	Certification, Costs, Scaling Up Software, Deployment		CO5	46	DIoT – Chapter 10, Page 282
	47	5	Correctness and Maintainability, Security, Performance, User Community		CO5	47	DIoT – Chapter 10, Page 285
	SS	5	Characterizing the Internet of Things, Privacy, Control, Disrupting Control, Crowdsourcing, Environment, Physical Thing		CO5		DIoT – Chapter 11, Page 289

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered.	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
	48	5	Electronics, Internet Service, Solutions		CO5	48	DIoT – Chapter 11, Page 304
13	49	5	The Internet of Things as Part of the Solution, Cautious Optimism, The Open Internet of Things Definition		CO5	49	DIoT – Chapter 11, Page 305
	50	5	Viva/ Students' Activity on module 5		CO5	50	

6 Rubric for Grading and Marking of Term Work (inform students at the beginning of semester)

Lecture + Practical (% of class participation) & Marks	Assignments	Tutorial	Lab / Practical Performance	Lab Journal Assessment	Class Tests (Other than IA)	Other (1) specify	Other (2) specify	Total
Active Participation (5)	5 assignments		Practical Submission (100) Scaled down to 5		5 Test on each unit (10 marks)			20 marks

7 Assignments / Tutorials Details

Assignment/ Tutorial No.	Title of the Assignments / Tutorials	CO Map	Assignment/ Tutorials given to Students on	Week of Submission
1	MOOC Course	CO1,CO2 and CO3	1st Week	2nd Week

2	Enchanted objects – Flipped Classroom	CO1	3rd week	4th week
3	Electronic Components for IoT – Regular	CO2	5th week	6th week
4	Open Book Test	CO3	7th week	7th Week
5	Business Models – Case Study	CO4	8th week	9th week

Analysis of Assignment / Tutorial Questions and Related Resources

Assignment / Tutorial No.	Week No.	Type* (√)			Module No.	Based on #			Question Type (√)	
		R	PQ	OBT		Text Book	Reference Book	Other Learning Resource	MU EQ	Thought Provoking
1	3	√			1	√	√		√	
2	5	√			2	√	√	√	√	√
3	8	√	√		3	√		√	√	√
4	10	√			4	√	√	√	√	√
5	12	√		√	5	√	√		√	√

* Tick (√) the Type of the Assignment: Regular (R); Pop Quiz (PQ) ; Open Book Test for TE/BE/ME (OBT)
# Write number for text book, reference book, other learning resource from this AAP – *from Points 4.a to 4.d*

8 Internal Assessment / Other Class Test / Open Book Test (OBT)/Take Home Test (THT) Details

Tests	Test Dates	Module No.	CO Map	IA Question Paper Pattern	Policy
1st IA Test	Week 6	1 & 2			No IA Re-test
2nd IA Test	Week 12				IA is a Head of passing *
Pop Quiz	Week 9	1		10 MCQ's – 01 marks each	
Open Book Test	Week 7	1,2		4 Questions	
Take Home Test	Week 12	All		4 Questions	
Mobile Based App Quiz					
Minute Papers				Topic based on Memory Management	

Case Studies				Student Discussion on Business Models	

*** Failures of IA test (IA1+IA2) shall appear for IA test in the next semester. There is no provision for re-test in the same semester.**

9.a Practical Activities

Practical No.	Module No.	Title of the Regular Experiments	Concepts to be highlighted	CO Map	Audit / Quality Rate (0 to 4)
0	2	Starting Raspbian OS, Familiarising with Raspberry Pi Components and interface, Connecting to ethernet, Monitor, USB.	Using Raspberry Pi	CO2	4
1	2	Displaying different LED patterns with Raspberry Pi.	LED components	CO2	4
2	2	Displaying Time over 4-Digit 7-Segment Display using Raspberry Pi	Time Display	CO2	4
3	2	Raspberry Pi Based Oscilloscope	Frequency Monitoring	CO2	4
4	2	Controlling Raspberry Pi with telegram bot	Internet with Mobile App	CO2	4
5	3	Fingerprint Sensor interfacing with Raspberry Pi	Security based Application	CO3	4
6	3	IoT based Web Controlled Home Automation using Raspberry Pi	Internet with Mobile App	CO3	4
7	3	Visitor Monitoring with Raspberry Pi and Pi Camera	Security based Application	CO3	4
8	3	Interfacing Raspberry Pi with RFID.	Security based Application normal distribution	CO3	4
9	3	Raspberry Pi GPS Module Interfacing	Location based Application	CO3	4
10	3	Setting up Wireless Access Point using Raspberry Pi	Remote Access	CO3	4
11	3	Installing Windows 10 IoT Core on Raspberry Pi	Using Raspberry Pi	CO2	4

9.b Practical Activities – Newly Added Experiments

Practical No.	Module No.	Title of the Newly Added Experiments	Concepts to be highlighted	CO Map	Audit / Quality Rate (0 to 4)
1	3	LCD interfacing with Raspberry Pi	Use of LCD with Pi	CO3	4

9.c Practical Activities – PBL Experiments

Practical No.	Module No.	Title of the PBL Experiments	Concepts to be highlighted	CO Map	Audit / Quality (0 to 4)
1	3	Home Automation with Multiple Devices	Internet with Mobile App	CO3	4

10 Beyond Syllabus Activities for Gap Mitigation

No.	Type of the Activity	Activities	Number of beneficiaries	Other Details – guest profile, feedback, mark sheet, report
1	**Experiential learning/Interaction with Outside World**	1- Guest Lectures by Industry Expert	All the students	Guest Lecture on 'Recording and Analysing Data
		2- Workshops		
		3- Mini Project	All the students	
		4- Industrial Visit	All the students	
		5- Any other activity		
2	**Collaborative & Group Activity**	6- Poster Presentation	All the students	
		7- Minute Papers	All the students	Yes, Topic based on Memory Management
		8- Students Seminars		
		9- Students Debates		
		10- Panel Discussion / Mock GD		
		11- Mock Interview		
		12- Any other activity PPT Presentation	All the students	
3	**Co-Curricular Activity**	13- Informative videos		Yes

		(NPTEL/YouTube /TEDx/ MIT OW/edX)		
		14- Lecture Capture Usage	All Students	Yes
		15- Any other activity		
4	**Tests & Assessments**	16- Class Tests/ Weekly Tests	All the students	
		17- Pop Quiz		Yes
		18- Mobile App Based Quiz		
		19- Open Book Test		Yes
		20- Take Home Test		Yes
		21- Any other activity		

11.1 One-on-One Academic Mentoring Meetings done

No.	Name of Mentee	Date of One-On-One Meeting		
		Beginning of Sem.	After Mid Term Results	Before End Sem.

11.2 Identify concerns and refer appropriately

No.	Name of Mentee	Action Taken		
		Individual Goals Identified	Any Financial Concern which needs to be referred to	Any Emotional Concern to be referred to

*** Do not delete any activity. Give details for planned events. Write 'NA' for activity Not Planned.**

Consolidated Academic Administration Plan Prepared by (mention all theory teaching faculty names with signature)

Please write below your name and sign with date of the external cluster mentor meeting

Mr.Sabir Moin Shaikh	

External Industry Mentor	External Academic Mentor	VSIT HoD(DS)	Program HOD

VSIT
Vidyalankar School of Information Technology

Version 05/23-9

Consolidated Academic Administration Plan for the Course

Next Generation Technologies
Sem. V – Program B.Sc. IT 2023-24 – Odd Semester
Faculty - Prof. Spruha More

The academic resources available in VSIT –

VMIS (ERP)	V-Refer and V-Live	VSIT Library	VAC & MOOC Courses
Institute & Department Vision and Mission	Former IA question papers and solutions (prepared by faculty)	Former IA question papers solutions - hardcopy	Value Added Courses (VAC) are conducted throughout the semester & in the semester break - Enrol for the VACs
Program Educational Objectives (PEO)	MU end semester examination question papers and solutions (prepared by faculty)	MU end semester exam question paper & solutions - by faculty, hardcopy	
Program Specific Outcome (PSO)	Class notes and Digital Content for the subject (scanned / typed by faculty)	All text books, reference books, e -books mentioned in the syllabus & AAP	Online courses from NPTEL, Coursera etc. are pursued throughout the semester - Register for the course & get certified
Program Outcome (PO)	Comprehensive question bank, EQ, GQ, PPT, Class Test papers	Technical journals and magazines for reference	
Departmental Knowledge Map	Academic Administration Plan & Beyond Syllabus Activity report	VSIT library is member of IIT Bombay Library	Watch former lectures captured in LMS at VSIT

1.a Course Objectives (Write in detail – as per NBA guidelines)

Cognitive	What do you want students to know?	Student will be able to understand the concept and challenges of big data and usage of the tools required to manage and analyze big data.
Affective	What do you want students to think / care about?	Demonstrate effectively the analysis of unstructured data using MongoDB. Take care while enhance Web Page appearance using jQuery.
Behavioural	What do you want students to be able to do?	To create unstructured data using JSON format and implement CRUD operations on it using MongoDB. To apply various animations using jQuery.

Advice to Students:

Attend every class!!! Missing even one class can have a substantial effect on your ability to understand the course. Be prepared to think and concentrate, in the class and outside. I will try to make the class very interactive. Participate in the class discussions. Ask questions when you don't understand something. Keep up with the class readings. Start assignments and homework early. Meet me in office hour to discuss ideas, solutions or to check if what you understand is correct.

http://live.vsit.edu.in/vrefer

Collaboration Policy:

We encourage discussion between students regarding the course material. However, no discussion of any sort is allowed with anyone on the assignment and homework for the class. If you find solution to some problems in a book or on the internet, you may use their idea for the solution; provided you acknowledge the source (name and page in the book or the website, if the idea is found on the internet). Even though you are allowed to use ideas from another source, you must write the solution in your own words. If you are unsure whether or not certain kinds of collaboration is possible, please ask the teacher.

1.b Course Outcome (CO) Statements and Module-Wise Mapping (follow NBA guideline)

CO No.	Statements	Related Module/s
CO1	Student will be able to understand the concept and challenges of big data and usage of the tools required to manage and analyze big data.	Unit 1
CO2	Create and parse unstructured data.	Unit 5
CO3	Apply different CRUD operations to analyse unstructured data.	Unit 2
CO4	Administrate MongoDB deployment efficiently.	Unit 3
CO5	Design a web page with interactive effects.	Unit 4

1.c Mapping of COs with POs (mark S: Strong, M: Moderate, W: Weak, Dash '–': not mapped)

(List of POs is available in V-refer)

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

1.d Mapping of COs with PSOs (mark S: Strong, M: Moderate, W: Weak, Dash '–':not mapped)

	PSO 1	PSO 2	PSO 3	PSO 4
CO 1				
CO 2				
CO 3				
CO 4				
CO 5				

1.e Teaching and Examination Scheme (As specified by the University) for the Course

Categories	Humanities and Social Sciences	Basic Science	Engineering Science	Professional Core	General Education	Professional Elective	Project/ Internship	Open Elective
Tick suitable category				✓				

Subject Code	Subject Name	Teaching Scheme			Credits Assigned			
		Theory	Practical	Tutorial	Theory	TW/Practical	Tutorial	Total
USIT507	Next Generation Technologies	75+25		-	2		--	2

USIT6P7	Next Generation Technologies	-	50		-	2		2

Subject Code	Subject Name	Examination Scheme							
		Theory Marks IA Test			End Sem. Exam Marks	TW	Practical	Oral	Total
		IA 1	IA 2	Average of IA1 and IA2					
USIT507	Next Generation Technologies	20 (Scaled to 15)			75	100 (Scaled to 10)			100
USIT6P7	Next Generation Technologies	-					50		50

1.f Faculty-Wise Distribution of all Lecture-Practical-Tutorial Hours for the Course

Divisions	Lecture (Hrs.)	Practical (Hrs.)				Tutorial (Hrs.)			
		Batch 1	Batch 2	Batch 3	Batch 4	Batch 1	Batch 2	Batch 3	Batch 4
A	4.00	2	2	NA	NA	N.A.	N.A.	N.A.	N.A.
B	4.00	2	2	NA	NA	N.A.	N.A.	N.A.	N.A.
C	4.00	2	2	NA	NA	N.A.	N.A.	N.A.	N.A.

1.g Office Hours (Faculty will be available in office in this duration for solving students' query)

Division	Day	Time (at least 1 Hr. / Division)	Venue (Office Room No.)
A	Friday	2:30 pm to 3:30 pm	Reading Room
B	Friday	2:30 pm to 3:30 pm	Reading Room
C	Friday	2:30 pm to 3:30 pm	Reading Room

2.a Syllabus : Module Wise Teaching Hours and % Weightage in University Question Paper

Module No.	Module Title and Brief Details	Teaching Hrs. for each module	% Weightage in University Question Papers
1	Big Data, NoSQL and Introducing MongoDB	6	20
2	The MongoDB Data Model, Using MongoDB Shell, MongoDB Architecture	16	20
3	MongoDB Storage Engine, MongoDB Use Cases, MongoDB Limitations ,MongoDB Best Practices:	8	20
4	The End of Disk? SSD and In-Memory Databases, jQuery	10	20
5	JSON	10	20
* Insert rows for more modules in the Course	**Total**	**50**	**100**

2.b Prerequisite Courses

No.	Semester	Name of the Course	Topic/s
1	2	Web Programming	HTML tags, Cookie, PHP
2	3	DBMS	SQL queries
3	3	Python	Function, Exception Handling
4	4	Core Java	Class, objects, Exception Handling

2.c Relevance to Future Courses

No.	Semester	Name of the Course
1	5	Business Intelligence
2	5 & 6	Project

2.d Identify real life scenarios/examples which uses the knowledge of the subject (Discussion on how to prepare examples and case studies e.g. "Boeing Plane": C Programming Language – Intro to Computer Science – Harvard's CS50 (2018) – Bing video)

Real Life Scenario	Concept Used
Aadhar has used MongoDB as one of its databases to store this huge amount of data	Types of bigdata, Structurd data and Unstructured data(unit 1)
Otto uses MongoDB for Real-time Analytics	Mongodb queries concept(unit 3)
Shutterfly is a popular internet-based photo sharing and personal publishing company that manages a store of more than 6 billion images using MongoDB	Maintaining Database in MongoDB(unit 2)
MetLife uses MongoDB for "The Wall", an innovative customer service application that provides a consolidated view of MetLife customers profile.	Maintaining Database in MongoDB(unit 2)
EA access is an online gaming service that is using MongoDB database for its game "FIFA Online"	Application of MongoDB database(unit 3)

3 Past Results – Division-Wise

Details	Target – Nov 2023	Nov 2022	Nov 2020	Nov 2019
Course Passing % – Average of 2 Divisions	90%	76.19%	100%	100%
Marks Obtained by Course Topper (mark/100)	95	95	100	100

	Div A		Div B		Div C		Div D	
Year	Initials of Teacher	% Result	Initials of Teacher	% Result	Initials of Teacher	% Result	Initials of Teacher	% Result

Nov 22	SSM	87.30	SRM	74.65	SSM	73.81	SSM	67.27
Nov 2021	SRM	100%	SSM	100%	SRM	100%	SSM	100%
Dec 2020	SB/SM	100%	SB/SM	100%	SB/SM	100%	NA	NA
Nov 2019	SB	94.23	SM	89.29	SB	77.42	SM	80.33

4 All the Learning Resources – Books and E-Resources

4.a List of Text Books (T – Symbol for Text Books) to be Referred by Students

Sr. No	Text Book Titles	Author/s	Publisher	Edition	Module Nos.
1	Practical MongoDB	Shakuntala Gupta Edward Navin Sabharwal	Apress		Unit 1,2,3
2	Beginning jQuery	Jack Franklin Russ Ferguson	Apress	Second	Unit 4
3	Next Generation Databases	Guy Harrison	Apress		Unit 1,2,3
4	Beginning JSON	Ben Smith	Apress		Unit 5

4.b List of Reference Books (R – Symbol for Reference Books) to be Referred by Students

Sr. No	Reference Book Titles	Author/s	Publisher	Edition	Module Nos.
1.	MongoDB Basics	Eelco Plugge, Peter Membrey, David Hows	Apress	First	1,2,3
2.	MongoDB definitive guide	Kristina chodorow	O'REILLY	second	1,2,3
3.	Data Modeling for MongoDB	Steve Hoberman	Technics Publications,LLC	First	2
4.	Web Development with jQuery	Richard York	John Wiley & Sons, Inc		4

4.c List of E - Books (E – Symbol for E-Books) to be Referred by Students

Sr. No	E- Book Titles	Author/s	Publisher	Edition	Module Nos.
1	MongoDB Cookbook	Cyrus Dasadia, Amol Nayak	PACKT	Second	1 , 2, 3
2	JavaScript JSON CookBook	Ray Rischpater	PACKT	First	5

4.d **Reading latest / top rated research papers (at least 5 papers)**

Name of Paper	Name of Authors (Background)	Published in		Problem Statement
		Date	Journal	
Big Data Integration: A MongoDB Database and Modular Ontologies based Approach	Hanen Abbes, Faiez Gargouri MIRACL Laboratory, Higher Institute of Computer Science and Multimedia, BP 1030, Sfax University, Sfax, Tunisia	2020 IEEE 10th Symposium on Computer Applications & Industrial Electronics (ISCAIE)	https://ieeexplore.ieee.org/document/9108826	Big Data: Current Challenges and Future Scope
A Review on Various Aspects of MongoDb Databases	Anjali Chauhan M.tech Scholar, CSE Department, Rawal Institute of Engineering and Technology, Faridabad, Haryana, India	2015 IEEE International Conference on Consumer Electronics - Taiwan	https://ieeexplore.ieee.org/document/7216831)	Application of NoSQL database MongoDB
A Quantitative Performance Analysis between Mongodb and Oracle NoSQL	Hema Krishnan, Research Scholar, CUSAT M.Sudheep Elayidom, Associate Professor, School of Engineering, CUSAT T.Santhanakrishnan, Scientist E, NPOL	2019 6th International Conference on Computing for Sustainable Global Development (INDIACom)	https://ieeexplore.ieee.org/document/8991245	It describes the advantages of MongoDB when compared to other NoSQL databases and its applications in sentiment analysis.
A Comparative Study of MongoDB and Document-Based MySQL for Big Data Application Data Management	Cornelia A. Gy ˝orödi * , Diana V. Dum¸se-Burescu, Doina R. Zmaranda and	2015 13th International Conference on Engineering of Modern Electric	https://ieeexplore.ieee.org/document/7158433	The main objective of the paper is to make a comparative analysis of the impact that each specific database has on application performance when realizing CRUD requests

	Robert ¸S. Gy ˝orödi Department of Computers and Information Technology, University of Oradea,	Systems (EMES)		
Exploring the merits of nosql: A study based on mongodb	Benymol Jose; Sajimon Abraham School of computer Sciences, Mahatma Gandhi University, Kottayam	23 October 2017	IEEE	Study based on merits and demerits of mongoDb

4.e **Based on research paper an identify the current Problem statement**

Problem Statement			Used in				
	Quiz	Assignment	Lab	Mini Project	Poster Presentation	Test	Any Other
Big Data integration taking into account their characteristics		√ (Paper 1)					
Describes the advantages of MongoDB when compared to other NoSQL databases	√ (Paper 3)						
A review of various aspects of MongoDB is discussed in the paper							√ Case Study (Paper 2)
Objective of the paper is to make a comparative analysis of the impact that each specific database has on application performance when realizing CRUD requests				√ (Paper 4)			

Study based on merits and demerits of mongoDb	√ (Paper 5)						

4.f **Identify Companies / Industries which use the knowledge of the subject and thus may provide Internships and final Placements**

Name of the Company	To be / Contacted for		
	Student Internship	Student Final Placement	Faculty Internship
LTI,Wipro etc	√	√	

4.g **Identify suitable relevant TOP Guest Speakers from Industry**
(CS50 Lecture by Mark Zuckerberg - 7 December 2005 - YouTube)

Name of the Identified Guest Speaker	Designation	Name of the Company
Guillermo Rauch	Founder & CEO,	Vercel
Dev Ittycheria	Chief Executive Officer	MongoDB
Catherine Li	Head of Digital Enablement, Home Lending Technology	Wells Fargo

4.h **Identify relevant Technical competitions to participate [Competitions -Paper Presentations, Projects, Hackathons, IVs etc..]**

Name of the Relevant Technical Competition Identified to participate	Organized by	Date of the Event
Paper Presentation (National & International Conferences)	VSIT & other colleges	Aug 23
Case Study Presentation	VSIT	Sept 23

4.i **Identify faculty in TOP schools / Universities who are teaching same / similar subject and develop rapport e.g. Exchange Lecture Material (Assignments / Tests / Project etc..), Joint Paper Publication**

University	Name of the Course	Name of Faculty	Type of Collaboration		
			Exchange of Lecture Material	Joint Publication/ Research	Other
https://learn.mongodb.com/	MongoDB	Online Course	Video Lectures/Lab manual		

4.j **Module Best Available in - <u>Title</u> best resource [from *<u>4.a</u>* to *<u>4.d</u>* in this AAP] & give details**

Module No.	Title of the Module	Web Link	Mention the Tile

			Journal	E-Journal	Magazine	Other Resource
1	Json Application	Oracle Magzine https://blogs.oracle.com/oraclemagazine/working-with-json-arrays-in-plsql			√	
2	Mongodb	https://journals.sagepub.com/home/bds	√			
3	Jquery	https://www.tutorialsteacher.com/jquery		√		
4	AJAX	https://medium.com/@hossam.hilal0/ajax-jquery-ajax-tutorial-fdf35766ba7b	√			
5	Big Data	https://www.guru99.com/bigdata-tutorials.html	√			

4.k **Referred to any top-rated university in that subject for content**

University	Name of the Course	Name of Faculty	Date of Delivery of the Course	Remarks
Massachusetts Institute of Technology (MIT)	Data Analytics	-	-	

4.l **Faculty received any certification related to this subject. List of Certifications Identified / Done**

Course	Certifying Agency	No. of Hours	Level of the Course		Certification		Remarks
			Introductory	Advance Skill Development	Done on	Proposed to be on	
Mongo DB Basics	MongoDB University	06	Y		2021		

4.m **Completed subject wise/cluster wise training with cluster mentor. List of relevant Refresher Course Identified / Done**

Course	Certifying Agency (As suggested by DAB/Cluster Mentor/Industry/ University other than MU)	Certification		Remarks
		Done on	Proposed to be on	
Pedagogy				
PBL				
Sub. Content Training				

4.n Best Practices Identified and adopted

No.	Item	Best Practices Identified		
		Massachusetts Institute of Technology https://ocw.mit.edu/	Stanford University https://cs155.stanford.edu / Univ. 3 Mit xPRO https://executive-ed.xpro.mit.edu/post-graduate-certificate-in-cybersecurity?utm_source=Cybersecurityguide&utm_medium=Affiliate&utm_campaign=B-365D_WW_AF_cybersecurityguide_PGCCY_ALWON	Univ. 3 Mit xPRO https://executive-ed.xpro.mit.edu/post-graduate-certificate-in-cybersecurity?utm_source=Cybersecurityguide&utm_medium=Affiliate&utm_campaign=B-365D_WW_AF_cybersecurityguide_PGCCY_ALWON
1	Microsite	√	√	
2	Video Lectures	√		√
3	Assignments	√	√	√
4	Mini Project	√	√	
5	Assessment Metric	√	√	
6	Quizzes	√	√	√
7	Labs/ Practical (PBL)			
8	Tests	√		
9	Peer Assessment			
10	Any Other			

4.o Web Links for Online Notes/YouTube/VSIT Digital Content/VSIT Lecture Capture/NPTEL Videos

Students can view lectures by VSIT professors, captured through LMS 'Lecture Capture' in VSIT campus for previous years.

No.	Websites / Links	Module Nos.
1	NoSQL Database Working https://www.youtube.com/watch?v=0buKQHokLK8&t=182s	Unit 1
2	MongoDB Introduction https://www.youtube.com/watch?v=pWbMrx5rVBE	Unit 2
3	MongoDB for Beginners https://www.youtube.com/watch?v=gmlm7W1PZMA	Unit 2
4	Understanding MongoDB Architecture https://www.youtube.com/watch?v=1Pn8K6IDjO4	Unit 3
5	Exploring the replication and sharding in MongoDB https://www.youtube.com/watch?v=oH-gQ4JdXQc	Unit 3
6	JavaScript & jQuery Tutorial for Beginners https://www.youtube.com/watch?v=VRnQOcVclS8	Unit 5

7	JSON Tutorial - Javascript Object Notation https://www.youtube.com/watch?v=HHMj9NHC6Tc&list=PLf0Kt0-zrJjGsMUnaM3yghnN8HFBo9sQx	Unit 4

4.p Recommended MOOC Courses like Coursera / NPTEL / MIT-OCW / edX/VAC etc.

Sr. No.	MOOC Course Link	Course conducted by – Person / University / Institute / Industry	Course Duration	Certificate (Y / N)
1	Projects in MongoDB - Learn MongoDB Building Projects https://www.udemy.com/course/projects-in-mongodb/	Udemy.com	12 hrs	Y
2	JavaScript, jQuery, and JSON https://www.classcentral.com/course/javascript-jquery-json-9568	https://www.coursera.org/	40 hrs	Y
3	MongoDB Certification from university of MongoDB	https://university.mongodb.com/	6 hrs/ per course	Y

5 Consolidated Course Lesson Plan

	From (date/month/year)	To (date/month/year)	Total Number of Weeks
Semester Duration	12/06/2023	Oct-2023	13

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No. / Page Nos./ Books/ Web Site
1	1	4	jQuery: Introduction		4		Reference 2/2/17
	2	4	Traversing the DOM		4		Reference 2/2/1
	3	4	DOM Manipulation with jQuery		4		Reference 2/4/47
	4	4	DOM Manipulation with jQuery		4		Reference 2/4/47
2	5	4	Event Handling & Ajax with jQuery		4		Reference 2/8/113
	6	4	Event Handling & Ajax with jQuery		4		Reference 2/8/113
	SS	4	jQuery Plug-ins		4		Reference 2/9/127
	7	4	jQuery Image Slider & Revision		4		Reference 2/11/153

	8	4	Unit Assessment(PBL)		4		
3	9	1	Big Data: Getting Started, Big Data, Facts About Big Data, Big Data Sources, Three Vs of Big Data, Volume, Variety, Velocity,		1		Reference 1/1/1
	10	1	Usage of Big Data, Visibility, Discover and Analyze Information, Segmentation and Customizations, Aiding Decision Making, Innovation, Big Data Challenges, Policies and Procedures, Access to Data, Technology and Techniques,		1		Reference 1/1/9
	11	1	NoSQL: SQL, NoSQL, Definition, ACID vs. BASE, CAP Theorem (Brewer‟s Theorem)		1		Reference 1/2/13
	12	1	The BASE theorem, NoSQL Advantages and Disadvantages SQL vs. NoSQL Databases, Categories of NoSQL Databases		1		Reference 1/2/16
4	13	1	Introducing MongoDB: History, MongoDB Design Philosophy, Speed, Scalability, and Agility, Non-Relational Approach, JSON-Based Document Store, Performance vs. Features, Running the Database Anywhere, SQL Comparison		1		Reference 1/3/25
	SS	1	Legacy Systems and Big Data, Structure of Big Data, Data Storage, Data Processing,		1		Reference 1/1/10
	SS	1	Big Data Technologies, A Brief History of NoSQL		1		Reference 1/1/11
	14	1	Unit Assessment(Quiz)		1		
	15	1	Unit Assessment		1		
	16	5	JSON: Introduction, JSON Grammar, JSON Values, JSON Tokens, Syntax		5		Reference 4/4/55
5	17	5	JSON vs XML, Data Types, Objects-Creating & Accessing		5		Reference 4/5/67
	18	5	Objects-Updating & looping, nested objects, Arrays--Creating & Accessing		5		Reference 4/5/71 www.w3schools.com
	19	5	Creating JSON, JSON Object, Parsing JSON		5		Reference 4/6/88
	20	5	Persisting JSON, Data Interchange, JSON PHP, JSONP		5		Reference 4/7/102
	SS	5	Arrays--Updating & Nesting		5		www.w3schools.com

	SS	5	JSON HTML		5		www.w3schools.com
6	21	5	Unit Assessment(Quiz)		5		
	22	5	Unit Assessment(Test)		5		
	23	2	The MongoDB Data Model:The Data Model,JSON and BSON,The Identifier (_id),Capped Collection,Polymorphic Schemas, Object- Oriented Programming,Schema Evolution		2		Reference 1/4/29
	24	2	Using MongoDB Shell:Basic Querying,Create and Insert,Explicitly Creating Collections, Inserting Documents Using Loop,Inserting by Explicitly Specifying _id		2		Reference 1/6/53
7	25	2	Update, Delete, Read		2		Reference 1/6/61
	26	2	Read, Using Indexes		2		Reference 1/6/67
	27	2	Stepping Beyond the Basics,Using Conditional Operators, Regular Expressions		2		Reference 1/6/78
	28	2	MapReduce, aggregate()		2		Reference 1/6/82
8	29	2	Mid Unit Assessment – MongoDB Queries		2		
	30	2	Designing an Application‟s Data Model, Relational Data Modeling		2		Reference 1/6/84
	31	2	MongoDB Architecture:Core Processes,mongod,mongo,mongos,MongoDB Tools,Standalone Deployment		2		Reference 1/7/95
	32	2	Replication, Replica Set		2		Reference 1/7/97
9	33	2	Replica Set- Data Replication Process		2		Reference 1/7/103
	34	2	Implementing Advanced Clustering with Replica Sets,Sharding		2		Reference 1/7/115
	35	2	Sharding Components ,Data Distribution Process, Data Balancing Process		2		Reference 1/7/125
	36	2	Operations, Implementing Sharding		2		Reference 1/7/133
10	37	2	Points to Remember When Importing Data in a ShardedEnvironment, Monitoring for Sharding,Monitoring the Config Servers,		2		Reference 1/7/151
	SS	2			2		Reference 1/6/89

			Normalization, MongoDB Document Data Model Approach				
	SS	2	Controlling Collection Distribution (Tag-Based Sharding), Production Cluster Architecture,Scenario 1 , Scenario 2		2		Reference 1/7/142
	38		Unit Assessment(PBL)		2		
	39	3	MongoDB Storage Engine: Data Storage Engine, Data File (Relevant for MMAPv1), Namespace (.ns File), Data File (Relevant for WiredTiger)		3		Reference 1/8/159
	40	3	GridFS – The MongoDB File System, The Rationale of GridFS, GridFSunder the Hood, Using GridFS		3		Reference 1/8/178
11	41	3	Indexing, Types of Indexes, Behaviors and Limitations		3		Reference 1/8/183
	42	3	MongoDB Use Cases: Use Case 1 - Performance Monitoring, Schema Design, Operations, Sharding, Managing the Data		3		Reference 1/10/213
	43	3	MongoDB Limitations: MongoDB Space Is Too Large (Applicable for MMAPv1), Memory Issues (Applicable for Storage Engine MMAPv1), 32-bit vs. 64-bit, BSON Documents, Namespaces Limits,		3		Reference 1/11/227
	44	3	MongoDB Best Practices: Deployment, Hardware Suggestions from the MongoDB Site, Few Points to be Noted, Coding, Application Response Time Optimization, Data Safety, MongoDB Not Applicable Range		3		Reference 1/12/233
12	SS	3	MongoDB Limitations: Indexes Limit, Capped Collections Limit , Sharding Limitations, Security Limitations Use Case 2 – Social Networking, Schema Design, Operations, Sharding		3		Reference 1/11/229 Reference 1/10/220
	SS	3	MongoDB Best Practices: Administration, Replication Lag, Sharding, Monitoring		3		Reference 1/12/240
	45	3	Unit Assessment(OBT)		3		
	46	3	Unit Assessment		3		
	47	4	The End of Disk? SSD and In-Memory Databases: The End of Disk?, Solid State Disk, The Economics of Disk		3		Reference 3/7/87

	48	4	SSD-Enabled Databases, In-Memory Databases, TimesTen, Redis		3		Reference 3/7/94
13	49	4	SAP HANA, Berkeley Analytics Data Stack and Spark Spark Architecture		3		Reference 3/7/95
	SS	4	VoltDB, Oracle 12c "in-Memory Database		3		Reference 3/7/97
	50	4	Unit Assessment(OBT)		3		

6 Rubric for Grading and Marking of Term Work (inform students at the beginning of semester)

Lecture + Practical (% of class participation) & Marks	Assign-ments	Tutorial	Lab / Practical Performance	Lab Journal Assessment	Class Tests (Other than IA)	Other (1) specify	Other (2) specify	Total
75% Attendance, Active Participation – 10 Marks	1		45 – 40 (Practical) + 5 (viva)	5		IA 1 -20 Scaled to 15 Marks		75

7 Assignments / Tutorials Details

Assignment/ Tutorial No.	Title of the Assignments / Tutorials	CO Map	Assignment/ Tutorials given to Students on	Week of Submission
1	jQuery - PBL	5	2rd week	3rd week
2	JSON - OBT	2	5th week	5th week
3	MongoDB Storage Engine - Regular	4	10th Week	11th Week

Analysis of Assignment / Tutorial Questions and Related Resources

Assignment / Tutorial No.	Week No.	Type* (√)			Module No.	Based on #			Question Type (√)	
		R	PQ	OBT		Text Book	Reference Book	Other Learning Resource	MU EQ	Thought Provoking
1	2		√		4	√			√	√

2	6			√	1	√			√	√
3	10	√			5	√			√	√

* Tick (√) the Type of the Assignment: Regular (R); Pop Quiz (PQ) ; Open Book Test for TE/BE/ME (OBT)
# Write number for text book, reference book, other learning resource from this AAP – *from Points 4.a to 4.d*

8 Internal Assessment / Other Class Test / Open Book Test (OBT)/Take Home Test (THT) Details

Tests	Test Dates	Module No.	CO Map	IA Question Paper Pattern	Policy
1st IA Test	7th week	4 & 1	5 & 1	Q1 – Short Questions - 10 Marks Q2 – 1 numerical 5 Marks Q3 – 1 numerical 5 Marks 20 marks each for IA 1 & 2	No IA Re-test IA is a Head of passing *
2nd IA Test	11th Week	2 & 5	3 & 2		
Pop Quiz	Frequently During Lecture	1 - 5	1-5	MS Teams	
Open Book Test	5th week	5	2		
Take Home Test	-	-	-		
Class tests / prelims	9th week	4	4		
Class tests / prelims					
Any other test/exams					

*** Failures of IA test (IA1+IA2) shall appear for IA test in the next semester. There is no provision for re-test in the same semester.**

9.a Practical Activities

Practical No.	Module No.	Title of the **Experiments**	Type of Experiment		Topics to be highlighted	CO Map
			PBL	Newly Added		
1	1	**Programs on Basic jQuery** a jQuery Basic, jQuery Events b jQuery Selectors, jQuery Hide and Show effects c jQuery fading effects, jQuery Sliding effects	Yes		Basic jQuery	C05
2	1	**jQuery Advanced** a jQuery Animation effects, jQuery Chaining b jQuery Callback, jQuery Get and Set Contents	Yes		jQuery Advanced	C05

		c jQuery Insert Content, jQuery Remove Elements and Attribute				
3	2	**JSON** a Creating JSON b Parsing JSON c. Export MongoDB to JSON	Yes		JSON	C02
4	2	**MongoDB Basics** a Write a MongoDB query to create and drop database. b Write a MongoDB query to create, display and drop collection c Write a MongoDB query to insert, query, update and delete a document.	Yes		MongoDB Basics	C03
5	2	**Simple Queries with MongoDB**	Yes		CRUD operations	C03
6	2	**Implementing Aggregation** a Write a MongoDB query to use sum, avg, min and max expression. b Write a MongoDB query to use push and add ToSet expression. c Write a MongoDB query to use first and last expression.	Yes		Implementing Aggregation	C03
7	4	**Replication, Backup and Restore** a Write a MongoDB query to create Replica of existing database. b Write a MongoDB query to create a backup of existing database. c Write a MongoDB query to restore database from the backup.	Yes		Replication, Backup and Restore	C04
8	4	**Python and MongoDB** Connecting Python with MongoDB and inserting, retrieving, updating and deleting.	Yes		Python and MongoDB	C03
9	4	**Java and MongoDB** Connecting Java with MongoDB and inserting, retrieving, updating and deleting.	Yes		Java and MongoDB	C03
10	4	**PHP and MongoDB**	Yes		Php and MongoDB	C03

		Connecting PHP with MongoDB and inserting, retrieving, updating and deleting.				
11	4	Create Plugin for changing background color of the page after every 30 seconds.		Yes	jQuery	C04
1	2	Write a Mongo DB query to analyse udemy course data		Yes	MongoDB Advanced Queries	C05

10 Beyond Syllabus Activities for Gap Mitigation

No.	Type of the Activity	Activities	Number of beneficiaries	Other Details – guest profile, feedback, mark sheet, report
1	**Experiential learning/Interaction with Outside World**	1- Guest Lectures by Industry Expert		
		2- Workshops		
		3- Mini Project		
		4- Industrial Visit		
		5- Any other activity		Case Study Presentation
2	**Collaborative & Group Activity**	6- Poster Presentation	Video Presentation	
		7- Minute Papers		
		8- Students Seminars		
		9- Students Debates		
		10- Panel Discussion / Mock GD		
		11- Mock Interview		
		12- Any other activity		
3	**Co-Curricular Activity**	13- Informative videos (NPTEL/Youtube /TEDx/ MIT OW/edX)	Yes	
		14- Lecture Capture Usage	Yes	
		15- Any other activity		

4	**Tests & Assessments**	16- Class Tests/ Weekly Tests	Yes	
		17- Pop Quiz		
		18- Mobile App Based Quiz	Yes	
		19- Open Book Test	Yes	
		20- Take Home Test	Yes	
		21- Any other activity		

11.1 One-on-One Academic Mentoring Meetings done

No.	Name of Mentee	Date of One-On-One Meeting		
		Beginning of Sem.	After Mid Term Results	Before End Sem.

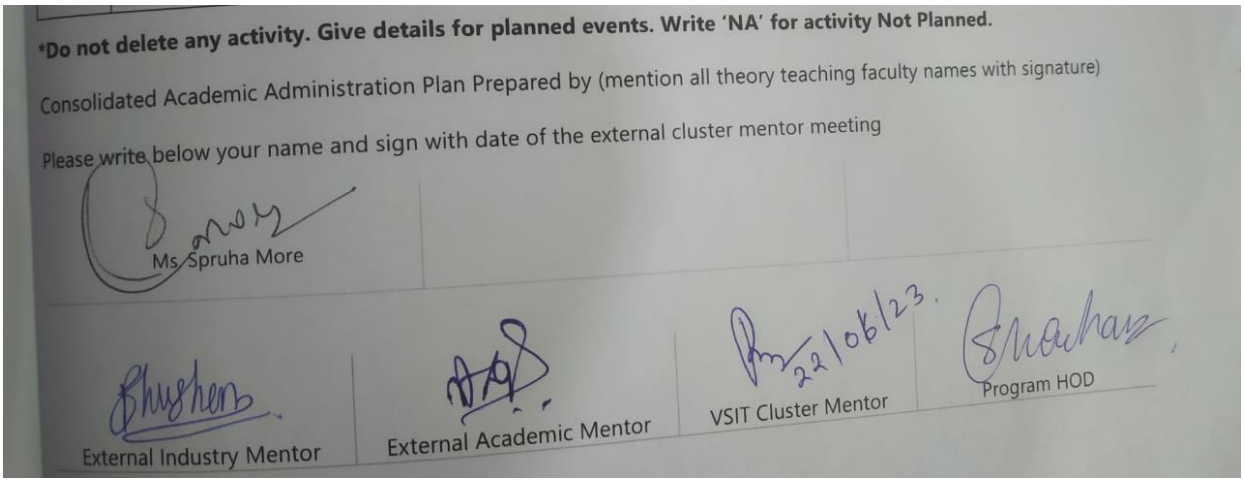
11.2 Identify concerns and refer appropriately

No.	Name of Mentee	Action Taken		
		Individual Goals Identified	Any Financial Concern which needs to be referred to	Any Emotional Concern to be referred to

***Do not delete any activity. Give details for planned events. Write 'NA' for activity Not Planned.**

Consolidated Academic Administration Plan Prepared by (mention all theory teaching faculty names with signature)

Please write below your name and sign with date of the external cluster mentor meeting



VSIT | Vidyalankar School of Information Technology

Version 2023-24

Consolidated Academic Administration Plan for the Course

USIT 404 Software Engineering, USIT4P4 Software Engineering Practical
Sem.IV – B.Sc. (Information Technology)– 2023-2024 – Even Semester
Ms. Janhavi Vadke, Ms. Mithila Chavan, Mr. Rajendra Patole

The academic resources available in VSIT –

VMIS (ERP)	V-Refer and V-Live	VSIT Library	VAC & MOOC Courses
Institute & Department Vision and Mission	Former IA question papers and solutions (prepared by faculty)	Former IA question papers solutions - hardcopy	Value Added Courses (VAC) are conducted throughout the semester & in the semester break - Enrol for the VACs
Program Educational Objectives (PEO)	MU end semester examination question papers and solutions (prepared by faculty)	MU end semester exam question paper & solutions - by faculty, hardcopy	
Program Specific Outcome (PSO)	Class notes and Digital Content for the subject (scanned / typed by faculty)	All text books, reference books, e -books mentioned in the syllabus & AAP	Online courses from NPTEL, Coursera etc. are pursued throughout the semester - Register for the course & get certified
Program Outcome (PO)	Comprehensive question bank, EQ, GQ, PPT, Class Test papers	Technical journals and magazines for reference	
Departmental Knowledge Map	Academic Administration Plan & Beyond Syllabus Activity report	VSIT library is member of IIT Bombay Library	~~Watch former lectures captured in LMS at VSIT~~

1.a Course Objectives (write in detail – follow NBA guideline in this regard)

Cognitive	What do you want students to know?	Basic knowledge and understanding of the analysis and design of complex systems. role of project management including planning, scheduling, risk management, etc.
Affective	What do you want students to think / care about?	To manage time, processes and resources effectively by prioritising competing demands to achieve personal and team goals Identify and analyses the common threats in each domain.
Behavioural	What do you want students to be able to do?	Ability to apply software engineering principles and techniques. Ability to develop, maintain and evaluate large-scale software systems. Ability to understand and meet ethical standards and legal responsibilities.

Advice to Students:

Attend every class!!! Missing even one class can have a substantial effect on your ability to understand the course. Be prepared to think and concentrate, in the class and outside. I will try to make the class very interactive. Participate in the class discussions. Ask questions when you don't understand something. Keep up with the class readings. Start assignments and homework early. Meet me in office hour to discuss ideas, solutions or to check if what you understand is correct.

Collaboration Policy:

We encourage discussion between students regarding the course material. However, no discussion of any sort is allowed with anyone on the assignment and homework for the class. If you find solution to some problems in a book or on the internet, you may use their idea for the solution; provided you acknowledge the source (name and page in the book or the website, if the idea is found on the internet). Even though you are allowed to use ideas from another source, you must write the solution in your own words. If you are unsure whether certain kinds of collaboration are possible, please ask the teacher.

1.b Course Outcome (CO) Statements and Module-Wise Mapping (follow NBA guideline)

CO No.	Statements	Related Module/s
CO1	To learn basic concepts related to requirement engineering, different software development models, SRS document	Unit 1
CO2	To understand types of critical systems and learn about system models	Unit 2
CO3	To design and manage the software, different software architectural styles	Unit 3
CO4	To Verify and validate software and to estimate the cost of software	Unit 4
CO5	To learn about process improvement and different types of software engineering	Unit 5

1.c Mapping of COs with POs (mark S: Strong, M: Moderate, W: Weak, Dash '–': not mapped)

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12
CO 1	S	M	M	S	M							
CO 2	M	M	W	M	M							
CO 3	W	W	M	M	W							
CO 4	S	M	W	M	M							
CO 5	S	M	M	M	M							

1.d Mapping of COs with PSOs (mark S: Strong, M: Moderate, W: Weak, Dash '–':not mapped)

	PSO 1	PSO 2	PSO 3	PSO 4
CO 1	M	M	M	
CO 2	S	S	M	
CO 3	M	S	M	
CO 4	M	M	M	
CO 5	M	M	S	

1.e Teaching and Examination Scheme (As specified by the University) for the Course

Categories	Mathematics	Computing / IT / Electronics	Humanities & Soft Skill	Social Sciences	Commerce	Management	Multidisciplinary
Tick suitable category		√					

Subject Code	Subject Name	Teaching Scheme			Credits Assigned			
		Theory	Practical	Tutorial	Theory	TW/Practical	Tutorial	Total
USIT404	Software Engineering	75	-	--	2	-		2
USIT4P4	Software Engineering	-	50		-	2		2

Subject Code	Subject Name	Examination Scheme							
		Theory Marks IA Test			End Sem. Exam Marks	TW	Practical	Oral	Total
		IA 1	IA 2	Average of IA1 and IA2					
USIT401	Software Engineering	30(Scaled to 20)	-	20	75	25			100
USIT4P1	Software Engineering Practical						45	5	50

1.f Faculty-Wise Distribution of all Lecture-Practical-Tutorial Hours for the Course

Divisions	Lecture (Hrs.)	Practical (Hrs.)				Tutorial (Hrs.)			
		Batch 1	Batch 2	Batch 3	Batch 4	Batch 1	Batch 2	Batch 3	Batch 4
Div A	4.00	2.00	2.00	NA	NA	N.A.	N.A.	N.A.	N.A.
Div B	4.00	2.00	2.00	NA	NA	N.A.	N.A.	N.A.	N.A.
Div C	4.00	2.00	2.00	NA	NA	N.A.	N.A.	N.A.	N.A.
Div D	4.00	2.00	2.00	NA	NA	N.A.	N.A.	N.A.	N.A.
Div E	4.00	2.00	2.00	NA	NA	N.A.	N.A.	N.A.	N.A.
Div F	4.00	2.00	2.00	NA	NA	N.A.	N.A.	N.A.	N.A.

1.g Office Hours (Faculty will be available in office in this duration for solving students' query)

Division	Day	Time (at least 1 Hr. / Division)	Venue (Office Room No.)
A to F	Monday	3.00pm to 4:00 pm	X – 011

2.a Syllabus : Module Wise Teaching Hours and % Weightage in University Question Paper

Module No.	Module Title and Brief Details	Teaching Hrs. for each module	% Weightage in University Question Papers
1	Introduction, Software Requirements, Software Processes, Software Development Process Models, Agile software development.	12 lectures X 60 minutes	20
2	Socio-technical system, Critical system, Requirements Engineering Processes, System Models	09 lectures X 60 minutes	20

3	Architectural Design, User Interface Design, Project Management, Quality Management	10 lectures X 60 minutes	20
4	Verification and Validation, Software Testing, Software Measurement, Software Cost Estimation.	09 lectures X 60 minutes	20
5	Process Improvement, Service Oriented Software Engineering, Software reuse, Distributed software engineering	10 lectures X 60 minutes	20
* Insert rows for more modules in the Course	**Total**	**50 Lectures x 60 minutes**	**100**

2.b Prerequisite Courses

No.	Semester	Name of the Course	Topic/s
1	1	Operating System	File Management, Distributed Operating System
2	2	Object Oriented Programming, Web Programming	Classes and Objects
3	3	Database Management System	UML
4	3	Computer Network	Client Server architecture, OSI Model

2.c Relevance to Future Courses

No.	Semester	Name of the Course
1	5	Software Project Management
2	6	Software Quality Assurance
3	5 & 6	Project

2.d Identify real life scenarios/examples which uses the knowledge of the subject (Discussion on how to prepare examples and case studies e.g. "Boeing Plane": C Programming Language – Intro to Computer Science – Harvard's CS50 (2018) – Bing video)

Real Life Scenario	Concept Used
Case Study on Web Publishing System-College Website, SRS Writing and Testing	SRS Writing, Waterfall Model, Agile, CMMI, Testing
Car Manufacturing making use of waterfall models	
Case Study on Philips using Agile Methodology	
JPMorgan Investment Bank Technology-CMMI	

3 Past Results – Division-Wise

Details	Target – April 2023	April 2022	April 2021	April 2020
Course Passing % – Average of 3 Divisions	92%	100%	100%	99.42%
Marks Obtained by Course Topper (mark/100)	65	75	75	75

	Division A & B		Division C & D		Division E & F	
Year	Initials of Teacher	% Result	Initials of Teacher	% Result	Initials of Teacher	% Result
April 2023	KS RP	A-96.61 B- 96.43	KS RP	C-91.11 D-82.46	KS	F-96.61
April 2022	KS RP	A-100 B- 100	KS RP	C-100 D-100	KS	E-100 F-100
April 2021	KS RP	A-100 B- 100	KS RP	C-100 D-100	KS RP	E-100 F-100
April 2020	KS RP	A-98.21 B- 100	MC RP	C-100 D-100	KS MC	E-100 F-97.62

Topics which affect results negatively	Module Number	Recommendations to overcome these issues & improve result in future
User Interface Design	3	Making them write the answer
Algorithm cost modelling	4	More no. of examples to be solved
System Modelling	2	Making them solve many more examples.

4 All the Learning Resources – Books and E-Resources

4.a List of Textbooks (T – Symbol for Textbooks) to be Referred by Students

Sr. No	Textbook Titles	Author/s	Publisher	Edition	Module Nos.
1	Software Engineering	Ian Somerville	Pearson Education	Ninth	1-5
2	Software Engineering	Pankaj Jalote	Narosa Publication	-	1-5
3	Software Engineering, A Practitioner's Approach	Roger Pressman	TMH	Seventh	1-5

4.b List of Reference Books (R – Symbol for Reference Books) to be Referred by Students

Sr. No	Reference Book Titles	Author/s	Publisher	Edition	Module Nos.
1	Software Design	D.Budgen	Pearson education	2nd	3

2	Software Engineering	KL James	PHI	IEEE	1-5
3	Software Engineering principles and practice	WS Jawadekar	TMH		1-5
4	Software Engineering-A Concise Study	S.A Kelkar	PHI India.		1-5
5	Software Engineering Concept and Applications	Subhajit Datta	OxfordHigher Education		1-5

4.c **List of E - Books (E – Symbol for E-Books) to be Referred by Students**

Sr No	E- Book Titles	Author/s	Publisher	Edition	Module Nos.
1	Software Engineering: Theory and practice https://archive.org/details/softwareengineer00pfle/page/n9/mode/2up	Shari Lawrence p-fleeger Jonnae	Pearson Education	2010	1-5
2	Software Engineering https://engineering.futureuniversity.com/BOOKS%20FOR%20IT/Software-Engineering-9th-Edition-by-Ian-Sommerville.pdf	Ian Sommerville	Pearson Education	Ninth	1-5
3	Software engineering, a practitioner's approach https://www.mlsu.ac.in/econtents/16_EBOOK-7th_ed_software_engineering_a_practitioners_approach_by_roger_s._pressman_.pdf	Roger Pressman	Tata Mcgraw-hill	Seventh	1-5

4.d **Reading latest / top rated research papers (at least 5 papers)**

Name of Paper	Name of Authors (Background)	Published in		Problem Statement
		Date	Journal	
A Survey of Software Development Process Models in Software Engineering	Iqbal H. Sarker (Edith Cowan University), Md. Faisal Faruque (University of Information Technology & Sciences), Ujjal Hossen and Atikur Rahman (University of Dhaka)	Nov 2015	International Journal of Software Engineering and its Applications 9(11):55-70 DOI:10.14257/ijseia.2015.9.11.05	Various software development process models are available. This paper objective is to help the developers to select specific model at specific situation depending on customer demand.
Software engineering: A quality management perspective	John McManus (European Institute for Economic Development)	June 2007	The TQM Journal 19(4)	There are many differences in the quality standards used. The paper shows that software engineers need to pay more attention to the

	A. Trevor Wood-Harper (The University of Manchester)		DOI:10.1108/09 5447807107562 23	performance and conformance issues in software projects and to be proactive rather than reactive to quality issues.
The role of verification and validation in software testing	Jogannagari Malla Reddy Lingaya's University, Faridabad, Haryana, INDIA S. V. A. V. Prasad Lingaya's University, Faridabad, Haryana, INDIA	16-18 March 2016	IEEE	The paper focuses on verification and validation techniques in software development and representing the future direction techniques in research.
A Study of Software Development Cost Estimation Techniques and Models	Junaid Rashid Muhammad Wasif Nisar (COMSATS University Islamabad) Toqeer Mahmood (National Textile University) Amjad Rehman	April 2020		All cost estimation techniques have their own pros and cons and they are challenged by the rapidly changing software industry. Since no single technique gives a hundred percent accuracy, that is why one technique and model should not be preferred over all others.
A Study of Developer Attitude to Component Reuse in Three IT Companies	Jingyue Li, Reidar Conradi, Parastoo Mohagheghi, Odd Are Sæhle, Øivind Wang, Erlend Naalsund & Ole Anders Walseth Conference paper	2004	Springer Volume 3009 ISBN : 978-3-540-21421-2	Focuses on challenges concerning some key factors in reusing of in-house built components. It also studies the relationship between the companies' reuse level and these factors.

4.e **Based on research paper identify the current Problem statement**

Problem Statement			Used in				
	Quiz	Assign ment	Lab	Mini Project	Poster Present ation	Test	Any Other
To select specific model at specific situation depending on customer demand for their project				YES			
Students need to give more attention to the performance and conformance issues in software projects and to be proactive rather than reactive to quality issues		YES					
Students need to Identify verification and validation techniques in software development.	YES					YES	
Identify one technique and model which will be used for cost estimation		Yes					
To demonstrate how informal communications between developers is helpful to supplement the limitation of component documentation, and therefore should be given more attention.			YES				

4.f **Identify Companies / Industries which use the knowledge of the subject and thus may provide Internships and final Placements**

Name of the Company	To be / Contacted for		
	Student Internship	Student Final Placement	Faculty Internship
	Yes	Yes	-

4.g **Identify suitable relevant TOP Guest Speakers from Industry (CS50 Lecture by Mark Zuckerberg - 7 December 2005 - YouTube)**

Name of the Identified Guest Speaker	Designation	Name of the Company

Mr.Bhavik Vala	Senior Software Engineer	Caratlane

4.h **Identify relevant Technical competitions to participate [Competitions -Paper Presentations, Projects, Hackathons, IVs etc..]**

Name of the Relevant Technical Competition Identified to participate	Organized by	Date of the Event
Codeathon	IT and DS Department of VSIT	March 2023

4.i **Identify faculty in TOP schools / Universities who are teaching same / similar subject and develop rapport e.g. Exchange Lecture Material (Assignments / Tests / Project etc..), Joint Paper Publication**

University	Name of the Course	Name of Faculty	Type of Collaboration		
			Exchange of Lecture Material	Joint Publication/ Research	Other
College of Engineering, Anna University - [CEG], Chennai	Bachelor of Technology [B.Tech] (Information Technology)	Dr. S. Sudha Faculty Member, Department Of Computer Science & Engineering	✓		

4.j **Module Best Available in - Title best resource [from *4.a* to *4.d* in this AAP] & give details**

Module No.	Title of the Module	Web Link	Mention the Tile			
			Journal	E-Journal	Magazine	Other Resource
1	Software Magazine, The Software Decision Journal	https://www.softwaremag.com/			✓	
2	Journal of Emerging Trends in Computing and	https://www.citefactor.org/journal/index/4958/journal-of-emerging-trends-in-computing-	✓			

	Information Sciences	and-information-sciences#.Y1-WXXZBzIU				
3	CODE magazine	https://www.codemag.com/magazine			✓	
4	HCI (Human Computer Interaction	https://nptel.ac.in/courses/106/103/106103115/		✓		
5	Journal of Software Engineering and Applications	http://www.scirp.org/journal/jsea	✓			

4.k **Referred to any top-rated university in that subject for content**

University	Name of the Course	Name of Faculty	Date of Delivery of the Course	Remarks
Stanford	Software Engineering	Mehran Sahami	Jul 3,2008	Recording available on Youtube.

4.l **Faculty received any certification related to this subject. List of Certifications Identified / Done**

Course	Certifying Agency	No. of Hours	Level of the Course		Certification		Remarks
			Introductory	Advance Skill Development	Done on	Proposed to be on	

4.m **Completed subject wise/cluster wise training with cluster mentor.**
List of relevant Refresher Course Identified / Done

Course	Certifying Agency (As suggested by DAB/Cluster Mentor/Industry/ University other than MU)	Certification		Remarks
		Done on	Proposed to be on	

PBL	Refresher Course on Next Generation Technologies	29th June to 13th July 2021		How to use new technologies in Teaching and Learning Process
Sub. Content Training	Integrating Lab Activity and Virtual Lab in Online Teaching Learning	24th July to 4th September 2021		How to develop virtual lab for the Practical oriented subjects

4.n Best Practices Identified and adopted

No.	Item	Best Practices Identified		
		Savitribai Phule Pune University	Shaheed Sukhdev College of Business Studies (CBS), Delhi	Carnegie Mellon University
1	Microsite			
2	Video Lectures	✓	✓	✓
3	Assignments	✓	✓	✓
4	Mini Project			✓
5	Assessment Metric		✓	
6	Quizzes	✓	✓	
7	Labs/ Practical (PBL)	✓		✓
8	Tests	✓	✓	✓
9	Peer Assessment		✓	
10	Any Other		presentations	

4.o Web Links for Online Notes/YouTube/VSIT Digital Content/VSIT Lecture Capture/NPTEL Videos

Students can view lectures by VSIT professors, captured through LMS 'Lecture Capture' in VSIT campus for previous years.

No.	Websites / Links	Module Nos.
1	SDLC Model	1

	https://www.youtube.com/watch?v=j9FkT-0IFLA	
2	Introduction to software engineering https://www.youtube.com/watch?v=tM9ePrmIDK8	1
3	Socio-Technical systems https://www.youtube.com/watch?v=xdFftbIToV0	2
4	Requirement Engineering / Specification https://www.youtube.com/watch?v=Qwt9vVE1cbM	2
5	7 Software Engineering User Interface Design https://www.youtube.com/watch?v=CBPDHHZcdoU	3
6	Process Modelling https://www.youtube.com/watch?v=2-buJiJxYHM	3
7	Verification & Validation https://www.youtube.com/watch?v=PVmxp7BG5l4	4
8	Software Testing https://nptel.ac.in/courses/106101061/22	4
9	Software Process Improvement Model https://www.youtube.com/watch?v=2VWupdVTxQg	5
10	Project quality Management https://nptel.ac.in/courses/106101061/32	5

4.p Recommended MOOC Courses like Coursera / NPTEL / MIT-OCW / edX/VAC etc.

Sr. No.	MOOC Course Link	Course conducted by – Person / University / Institute / Industry	Course Duration	Certificate (Y / N)
1	UML Class Diagrams for Software Engineering https://www.mooc-list.com/course/uml-class-diagrams-software-engineering-edx	KU Leuven University KULeuvenX	Self-paced	Y(Paid)
2	Agile Crash Course: Agile Project Management; Agile Delivery https://bit.ly/3DNRgqI	Ureducation	Self-paced	Y(400/-)

5. Consolidated Course Lesson Plan

	From (date/month/year)	To (date/month/year)	Total Number of Weeks
Semester Duration			

Week	Lecture no.	Module No.	Lecture Topics / IA 1 and IA 2 / BSA planned to be covered	Actual date of Completion	COs Mapped	Recommended Prior Viewing / Reading	
						Lecture No. (on LMS)	Chapter No./ Books/ Web Site
1	1	1	Subject Induction		CO1		
	2	1	What is software engineering? Software Development Life Cycle		CO1		
	3	1	Requirements Analysis, Software Design, Coding, Testing, Maintenance		CO1		
	4	1	Software Requirements: Functional and Non-functional requirements, User Requirements		CO1		Edition-8 Chp-1
	5	1	System Requirements, Interface Specification, Documentation of the software requirements.		CO1		
2	Self-Study	1	Software Processes: Process and Project, Component Software Processes.		CO1		Chp-2
	6	1	Software Development Process Models: Waterfall Model, Prototyping.		CO1		Chp-2
	7	1	Iterative Development, Rational Unified Process		CO1		Chp-2
	8	1	The RAD Model, Time boxing Model.		CO1		Chp-2
	9	1	Agile software development: Agile methods, Plan-driven and agile development.		CO1		Chp-3

3	10	1	Extreme programming, Agile project management, Scaling agile methods		CO2		Chp-3
	11	1	Unit 1 End Assessment, Written, Viva		CO2		
	12	1	Unit 1 End Assessment, Written, Viva		CO2		
	13	2	Socio-technical system: Essential characteristics of socio technical systems, Emergent System Properties, Systems Engineering		CO2		Chp-10
4	14	2	Components of system such as organization, people and computers, Dealing Legacy Systems.		CO2		Chp-10
	15	2	Critical system: Types of critical system, A simple safety critical system, Dependability of a system.		CO2		Edition-8 Chp-3
	Self-Study	2	Availability and Reliability, Safety and Security of Software systems.		CO2		Edition-8 Chp-3
	16	2	Requirements Engineering Processes: Feasibility study, Requirements elicitation and analysis.		CO2		Chp-4
	Self-Study	2	Requirements Validations, Requirements Management.		CO2		Chp-4
5	17	2	System Models: Models and its types, Context Models.		CO2		Chp-5
	18	2	Behavioural Models, Data Models		CO2		Chp-5
	19	2	Object Models, Structured Methods.		CO3		Chp-5

	20	2	Unit 2 End Assessment, Written, Viva		CO3		
	21	2	Unit 2 End Assessment, Written, Viva				
6	22	3	Architectural Design: Architectural Design Decisions, System Organisation, Modular Decomposition Styles.		CO3		Chp-6
	23	3	Control Styles, Reference Architectures.		CO3		Chp-6
	24	3	User Interface Design: Need of UI design, Design issues, The UI design Process, User analysis.		CO3		Edi-8 Chp-16
	25	3	User Interface Prototyping, Interface Evaluation.		CO3		Edi-8 Chp-16
7	26	3	Project Management Software Project Management, Management activities, Project Planning		CO3		Chp-22
	27	3	Project Scheduling, Risk Management.		CO3		Chp-22
	28	3	Quality Management: Process and Product Quality, Quality assurance and Standards, Quality Planning.		CO3		Chp-24
	29	3	Quality Control, Software Measurement and Metrics.		CO3		Chp-24
8	30	4	Unit 3 End Assessment, Written, Viva		CO4		
	31	4	Unit 3 End Assessment, Written, Viva				
	32	4	Verification and Validation: Planning Verification and Validation, Software Inspections, Automated Static Analysis.		CO4		Edi-8 Chp-22
	33	4	Verification and Formal Methods.		CO4		Edi-8 Chp-22

	34	4	Software Testing: System Testing, Component Testing.		CO4		Chp-8
9	35	4	Test Case Design, Test Automation		CO4		Chp-8
	36	4	Software Measurement: Size-Oriented Metrics, Function-Oriented Metrics.		CO4		
	37	4	Extended Function Point Metrics.		CO4		
	Self-Study	4	Software Cost Estimation: Software Productivity, Estimation Techniques		CO4		Edi-8 Chp-26
10	38	4	Algorithmic Cost Modelling, Project Duration and Staffing		CO4		Edi-8 Chp-26
	39	4	Unit 4 End Assessment, Written, Viva		CO4		
	40	4	Unit 4 End Assessment, Written, Viva		CO4		
	Self-Study	5	Process Improvement: Process and product quality.		CO5		Chp-26
	41	5	Process Classification, Process Measurement.		CO5		Chp-26
11	42	5	Process Analysis and Modelling, Process Change.		CO5		Chp-26
	43	5	The CMMI Process Improvement Framework.		CO5		Chp-26
	44	5	Service Oriented Software Engineering: Services as reusable components.		CO5		Edi-8 Chap-31
	45	5	Service Engineering, Software Development with Services.		CO5		Edi-8 Chap-31
12	46	5	Software reuse: The reuse landscape, Application frameworks		CO5		Chp-16

	47	5	Software product lines, COTS product reuse. Distributed software engineering: Distributed systems issues		CO5		Chp-16 Chp-18
		Self-Study	Client– server computing		CO5		Chp-18
	48	5	Architectural patterns for distributed systems, Software as a service		CO5		Chp-18
13	49	5	Unit 5 End Assessment, Written, Viva		CO5		
	50	5	Unit 5 End Assessment, Written, Viva		CO5		

6. Rubric for Grading and Marking of Term Work (inform students at the beginning of semester)

Lecture + Practical (% Attendance) & Marks	Assignments	Tutorial	Lab / Practical Performance	Lab Journal Assessment	Class Tests (Other than IA)	Other (1) specify	Other (2) specify	Total
75% Attendance, Active Participation – 10 Marks	3	-	40	10	-	IA 1 - 30 Marks, IA 2 – 30 Marks Scaled to 15 Marks	-	75

7. Assignments / Tutorials Details

Assignment/ Tutorial No.	Title of the Assignments / Tutorials	CO Map	Assignment/ Tutorials given to Students on	Week of Submission
1	Unit 1 (Written Assignment +Review)	1	3rd week	4th week
2	Unit 2 (One Minute Paper)	2	5th week	6th week
3	Unit 3 (Quiz)	3	7th week	7th week
4	Unit 4 (Open Book Test + Analysis)	4	10th week	10th week

5	Unit 5 (THT)	5	12th week	12th week

Analysis of Assignment / Tutorial Questions and Related Resources

Assignment / Tutorial No.	Week No.	Type* (√)			Module No.	Based on #			Question Type (√)	
		R	PQ	OBT		Textbook	Reference Book	Other Learning Resource	MU EQ	Thought Provoking
1	3	√			1	√			√	
2	5	√			2	√	√		√	
3	7			√	3	√			√	√
4	10	√			4	√		√		√
5	12		√		5	√				√

* Tick (√) the Type of the Assignment: Regular (R); Unannounced Quiz (UQ) ; Open Book Test for TY/SY/MASTERS (OBT)
# Write number for Text book, reference book, other learning resource from this AAP – *from Points 4.a to 4.d*

8. Internal Assessment / Other Class Test / Open Book Test (OBT)/Take Home Test (THT) Details

Tests	Test Dates	Module No.	CO Map	IA Question Paper Pattern	Policy
1st IA Test	Week 6/7	1-3	CO 1,2,3	Q1 – 15 Marks Q2 – 15 Marks	No IA Re-test IA is a Head of passing *
2nd IA Test					
Quiz	7th week, 10th week	3	CO 3		
Open Book Test	5th week	2	CO 2		
Take Home Test	9th week	4	CO 4		
Class tests	12th Week	5	CO 5		

*** IA failures will have to appear for re-test in next semester**

9.a Practical Activities – Regular Experiments

Practical No.	Module No.	Title of the **Regular Experiments**	Concepts to be highlighted	CO Map	Audit / Quality Rate (0 to 4)

1	2	Study and implementation of class diagrams for Online Bookstore System	Class Diagram	CO2	4
2	2	Study and implementation of Use Case Diagrams for Library management system	Use Case Diagram	CO2	4
3	2	Study and implementation of Entity Relationship Diagrams for University Database System	Entity Relationship Diagrams.	CO2	4
4	2	Study and implementation of Sequence Diagrams for hospital management system	Sequence Diagrams.	CO2	4
5	2	Study and implementation of State Transition Diagrams for Learning Management System	State Transition Diagrams.	CO2	4
6	2	Study and implementation of Data Flow Diagram for Online Movie Ticket Booking System	Data Flow Diagrams.	CO2	4
7	2	Study and implementation of Collaboration Diagram Railway management system.	Collaboration Diagrams.	CO2	4
8	3	Study and implementation of Activity Diagrams ATM transaction System	Activity Diagrams.	CO2	4
9	3	Study and implementation of Component Diagrams Precipitation System	Component Diagrams.	CO2	4
10	3	Study and implementation of Deployment Diagrams for Online Module System.	Deployment Diagrams.	CO2	4

9.b Practical Activities – Newly Added Experiments

Practical No.	Module No.	Title of the **Newly Added Experiments**	Concepts to be highlighted	CO Map	Audit / Quality Rate (0 to 4)
-	-	-	-	-	-

9.c Practical Activities – PBL Experiments

Practical No.	Module No.	Title of the **PBL Experiments**	Concepts to be highlighted	CO Map	Audit / Quality (0 to 4)

1	3	System Dynamics Diagram: You are tasked with modeling the dynamics of a traffic system in a growing city. The city is experiencing increased traffic congestion, and the stakeholders want to understand the interconnected factors influencing this issue.	Star UML Diagrams	CO2	4

10. Beyond Syllabus Activities for Gap Mitigation

No.	Type of the Activity	Activities	Details – no of attendees, guest, feedback, mark sheet, report
1	Interaction with Outside World	Guest Lecture / Workshops	Yes
2		Industrial Visit	-
3	Test and Assessments	Class Tests – (other than IA)	Yes Unit 5
4		Mini Projects	-
5		Pop Quiz	Yes Unit 3,4
6		Mobile App Based Quiz	-
7		Open Book Test	Yes Unit 2
8		Take Home Test	Yes Unit 4
9	Collaborative and Group Activity	Poster Presentation	-
10		Minute Papers	Yes Unit 1
11		Students Seminar	-
12		Students Debates	Yes Unit 5
13		Panel Discussion / Mock GD	-
14		Mock Interview	-
15	Co-curricular Courses	MOOC-NPTEL/Coursera Videos	Yes
16		Value Added Courses	-
17		Lecture Capture Usage	Yes

*** Do not delete any activity. Give details for planned events. Write 'NA' for activity Not Planned.**

Consolidated Academic Administration Plan Prepared by (mention all theory teaching faculty names with signature)

Ms. Janhavi Vadke
Sign

Ms. Mithila J. Chavan
Sign

Mr. Rajendra R. Patole
Sign

External Industry Mentor (Sign.)

External Academic Mentor (Sign.)

VSIT Cluster Mentor Name (Sign.) Head of Dept. (Sign.)