

**Vidya Pratishtan's
Kamalnayan Bajaj Institute of
Engineering and Technology, Baramati.
(An Autonomous Institute)**



Faculty of Science and Technology

Board of Studies

Computer Engineering


Syllabus


Multidisciplinary Minor

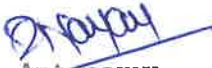
**(Pattern 2023)
(w.e.f. AY: 2024-25)**


Syllabus: Multidisciplinary Minor Computer Engineering															
(Pattern 2023) w.e.f. AY:2024-2025															
SEMESTER-III,IV,V,VI,VII															
Course Code	Courses Name	Teaching Scheme			Examination Scheme and Marks							Credits			
		TH	PR	TUT	Acti vity	ISE	ESE	TW	PR	OR	Total	TH	PR	TUT	Total
CO23051	Cloud Computing	2	2	-	20	20	50	20	-	-	110	2	1		3
CO23053	Computer Graphics and Gaming	2	2	-	20	20	50	20	-	-	110	2	1		3



Dept. Autonomy Coordinator
 Mr. M. D. Shelar


Academic Coordinator
 Dr. P. M. Paithane

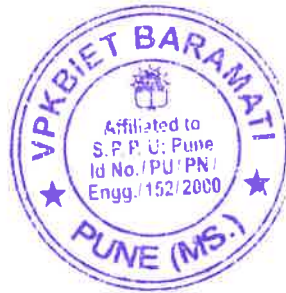

Head of Department
 Dr. G. J. Chhajed


Dean Autonomy
 Dr. C. B. Nayak

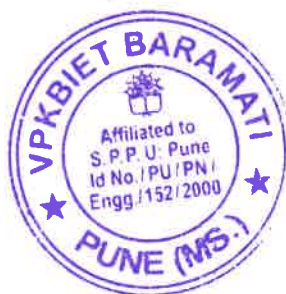

Dean Academic
 Dr. S. M. Bhosle


Principal
 Dr. R. S. Bichkar

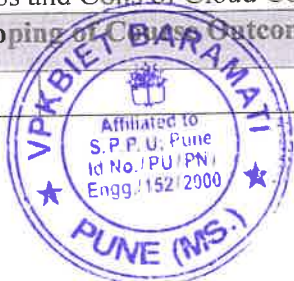
Vidya Shthan's
**Kamalnayan Bajaj Institute of
 Engineering & Technology, Baramati**
 Vidyanagari, Baramati-413133



Multidisciplinary Minor (MDM) Subjects			
AI23051	AI & Machine Learning	ET23053	Internet of Things
AI23052	Data Science	CE23051	Waste Management
AI23053	Generative AI	CE23052	Green Building & Smart Cities
CO23051	Cloud Computing	ME23051	Introduction to 3D Printing Technologies
CO23052	High Performance Computing	ME23052	Introduction to Robotics & Automaticn
CO23053	Computer Graphics & Gaming	EL23051	Solar Tech
IT23051	Cyber Security	EL23052	Industrial Automation
IT23052	Full Stack Development	GS23051	Nano Technology
ET23051	Embedded Systems	GS23052	Linear Algebra and Statistics
ET23052	Drone Technology		



CO23051 : Cloud Computing		
Teaching Scheme TH:02Hrs/Week PR:02Hrs/Week	Credit: 03	Examination Scheme: Course Activity: 20Mark In-Semester :20 Mark End-Semester :50 Mark Term work :20 Mark
	TH Credit :02 PR Credit :01	
Prerequisite: Computer Network, Database management System, Computer Organization		
Course Objective: <ul style="list-style-type: none"> ● To study fundamental concepts of cloud computing ● To understand scaling & services in cloud computing ● To understand goals & challenges in cloud computing ● To learn administrations & storage in cloud computing 		
Course Outcomes: Articulate <ol style="list-style-type: none"> 1. Summarize fundamental concepts of cloud computing. 2. Explain the concepts scaling & services in cloud computing 3. Explain the goals & challenges in cloud computing 4. Explain the administrations & storage in cloud computing 		
Course Activity : The course coordinator should identify relative and innovative activities for course activity. Below are some suggested course activity for course coordinator <ol style="list-style-type: none"> 1. Poster Presentation 2. Seminar Presentations 3. Survey on various cloud computing making tools 4. Industry Visit 5. Group Discussion 		
Course Contents		
Mapping of Course Outcomes for Unit I		CO1
UNIT I	Introduction to Cloud Computing	07 Hours
Origins and Influences, Brief History, Definition, Characteristics, Use cases, Technology Innovations, Technology Innovations vs. Enabling Technologies, Cloud, IT Resource, On-Premise, Types of Cloud, Cloud Consumers, Cloud Providers, Business Drivers, Capacity Planning, Cost Reduction, Organizational Agility		
Mapping of Course Outcomes for Unit II		CO2
UNIT II	Cloud Computing Scaling & Services	07 Hours
Scaling, Horizontal Scaling, Vertical Scaling, Cloud Service Models, Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS), Cloud Service Consumer, Introduction to Virtualization Technologies, Load Balancing and Virtualization, Understanding Hypervisors, Virtual Machines Provisioning and Manageability		
Mapping of Course Outcomes for Unit III		CO3
UNIT III	Cloud Computing Goals & Challenges	06 Hours
Goals and Benefits, Reduced Investments and Proportional Costs, increased Scalability, Increased Availability and Reliability, Risks and Challenges, Increased Security Vulnerabilities, Reduced Operational Governance Control, Limited Portability Between Cloud Providers, Multi-Regional Compliance and Legal Issues, Pros and Cons of Cloud Computing		
Mapping of Course Outcomes for Unit IV		CO4
UNIT IV	Cloud Computing Administrations & Storage	08 Hours



Roles and Boundaries, Cloud Provider, Cloud Consumer, Cloud Service Owner, Cloud Resource Administrator, Additional Roles, Organizational Boundary, Trust Boundary, Cloud Characteristics On-Demand Usage, Ubiquitous Access, Multitenancy (and Resource Pooling), Elasticity, Measured Usage, Resiliency, Cloud Storage: Direct Attached Storage, Storage Area Network, Network Attached Storage, Cloud Data Stores, Data Management, Provisioning Cloud storage

Books and Other Resources

Text Books:

1. "Cloud Computing Concepts, Technology & Architecture", Thomas Erl, Zaigham Mahmood, and Ricardo Puttini, PRENTICE HALL
2. "Cloud Security A Comprehensive Guide to secure Cloud Computing", Ronald L. Krutz, Russell Dean Vines, Wile

Reference Books:

1. "Cloud Computing: A Practical Approach for Learning and Implementation", A. Srinivasan, J. Suresh, Pearson, ISBN: 978-81-317-7651-3
2. "Mastering Cloud Computing" Rajkumar Buyya, Christian Vecchiola, S. Thamarai Selvi, McGraw Hill Education, ISBN-13:978-1-25-902995-

Guidelines for Term Work Assessment :

Term work assessment will be based on overall performance of Laboratory assignments performed by a students.

Guideline for Practical Conduction :

Use of open source software is encouraged. Based on the concepts learned. Instructor may also set one assignment that is suitable to respective branch beyond the scope of syllabus.

Operating System recommended :- 64-bit Open source Linux or its derivative, Windows

Programming tools recommended: - Python

Practical Assignments

1.	To Study of cloud service providers (aws, google & Microsoft-azure).
2.	To demonstrate Infrastructure as a service using cloud service provider.
3.	To demonstrate Software as a service using cloud service provider.
4.	To demonstrate Platform as a service using cloud service provider
5.	To demonstrate Storage as a service using cloud service provider.
6.	To make spreadsheet and notes using Google Drive
7.	Installation of VMWARE workstation & access the tools.



CO23053: Computer Graphics and Gaming

Teaching Scheme: TH:02Hrs/Week PR:02Hrs/Week	Credit: 03	Examination Scheme: Course Activity :20Marks In Semester :20Marks End Semester :50Marks Term-Work :20Marks
	TH Credit :02 PR Credit :01	

Prerequisite:
C++ programming (CPP)
Companion Course, if any: Computer Graphics Laboratory

- Course Objective:**
1. Remembering: To acquaint the learner with the basic concepts of Computer Graphics
 2. Understanding: To learn the various algorithms for generating and rendering graphical figures.
 3. Applying: To get familiar with mathematics behind the graphical transformations
 4. Understanding: To understand and apply various methods and techniques regarding animation.
 5. Creating: To generate Interactive graphics using OpenGL

- Course Outcomes:**
Students will be able to
1. Be familiar with the graphics designing concepts and devices.
 2. Construct a mathematical design using the development process.
 3. Recognize the design principles of animation and gaming application.
 4. Implement the use of gaming tools in application design.

Course Activity :
The course coordinator should identify relative and innovative activities for course activity. Below are some suggested course activity for course coordinator

6. Active participation in Gaming Competition
7. Poster Presentation
8. Video Presentations
9. Survey on various Animation making tools
10. Visit to Animation Business Schools

Course Contents

Mapping of Course Outcomes for Unit I		CO1
UNIT I	Basics of Computer Graphics	07 Hours

Introduction, What is computer Graphics? Area of Computer Graphics, Design and Drawing, Animation Multimedia applications, Simulation, How are pictures actually stored and displayed, Difficulties for displaying pictures. Graphics Devices Cathode Ray Tube, Quality of Phosphors, CRTs for Color Display, Beam Penetration CRT, The Shadow - Mask CRT, Direct View Storage Tube, Tablets, The light Pen, Three Dimensional Devices.

Mapping of Course Outcomes for Unit II		CO2
UNIT II	Two and Three Dimensional Transformations	07 Hours

Simple line drawing methods, Introduction Point Plotting Techniques Qualities of good line drawing algorithms The Digital Differential Analyzer (DDA), Bresenham's Algorithm Generation of Circles Introduction, what is transformation? Matrix representation of points Basic transformation, Translation, Rotation, Scaling, Need for 3-Dimensional Imaging Techniques for 3-Dimesional displaying, Translation, Rotation, Scaling

Mapping of Course Outcomes for Unit III		CO3
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UNIT III	Animation	07 Hours
<p>Animation: Introduction, Conventional and computer-based animation, Segment: Introduction, Segment table, Segment creation, closing, deleting and renaming, Visibility. Design of animation sequences, Animation languages, Key- frame, Morphing, Motion specification. Gaming: Introduction, Gaming platform (NVIDIA, i8060), Advances in Gaming.</p>		
Mapping of Course Outcomes for Unit IV		CO4
UNIT IV	Gaming	07Hours
<p>Principles of game design, Game Design Theory,MDA,8 type of Fun in Game, Visual style, Gameplay, Generate ideas for a game concept Idea Development Process, Stimulus, Genre Market Research, Target platform ,Creating Prototype Creating physical Games: Board Game, Card Game, Party Games and etc....</p>		
Books and Other Resources		
<p>TextBooks:</p> <ol style="list-style-type: none"> 1. Computer Graphics, Multimedia and Animation ,2010, Pakhira Malay K. 2. Donald D. Hearn and Baker- Computer Graphics with OpenGL, 4th Edition, ISBN-13: 9780136053583 <p>Reference Books:</p> <ol style="list-style-type: none"> 3. J. Foley, V. Dam, S. Feiner, J. Hughes, —Computer Graphics Principles and Practicel, 2nd Edition,Pearson Education, 2003, ISBN 81 – 7808 – 038 – 9. 4. D. Rogers, J. Adams, —Mathematical Elements for Computer Graphicsl, 2nd Edition, Tata McGrawHill Publication, 2002, ISBN 0 – 07 – 048677 – 8. 		
Guidelines for Term Work Assessment :		
<p>Term work assessment will be based on overall performance of Laboratory assignments performed by a students.</p>		
Guideline for Practical Conduction :		
<p>Use of open source software is encouraged. Based on the concepts learned. Instructor may also set one assignment or mini-project that is suitable to respective branch beyond the scope of syllabus. Operating System recommended :- 64-bit Open source Linux or its derivative, Windows Programming tools recominended: - Open Source C++ Programming tool like G++/GCC, OPENGL, DEV C++.</p>		
Guidelines for Practical Examination :		
<p>Problem statements will be formed based on assignments and performance will be evaluated by Internal and External Examiner. Relevant questions may be asked at the time of evaluation to test the student's understanding of the fundamentals, effective and efficient implementation.</p>		
Practical Assignments		
1.	Write C++ program to draw the line styles using DDA and Bresenham's algorithm	
2.	Write C++ program to draw a 4X4 chessboard.	
3.	Write C++ program to draw 2-D object and perform following basic transformations, a) Scaling b) Translation c) Rotation.	
4.	Write C++ program to draw Man Walking in the Rain with an Umbrella.	
5.	Write a C++ Program to make puzzle game.	
6.	Write a C++ Program to make Tic Tac Toe game.	
7.	Write a C++ Program to draw a car in motion.	

