Subject Name: **GRAPHICS AND VISUAL COMPUTING** **Subject Code:** TMC 401

Course Name: Master of Computer Applications (MCA)

1 Contact Hours: 48 **L** 3 **T** 0 **P** 2

2 Examination Duration(Hrs): **Theory** 0 3 **Practical** 0 0

3 Relative Weightage: **CWE:** 25 **MTE:** 25 **ETE:** 50

4 Credits: 0 3

5 Semester: [ ] [*] [ ]
Autumn **Spring** **Both**

6 Pre-Requisite: Knowledge of Basic Mathematics.

7 Subject Area: Computer Science.

8 Objective: To teach how to simulate the real object on computer screen.

9 Course Outcome:

A student who successfully fulfills the course requirements will be able to:

CO 1 Students will create interactive graphics applications in C using one or more graphics application programming interfaces.

CO 2 Students will write program functions to implement graphics primitives.

CO 3 Students will write programs that demonstrate geometrical transformations.

CO 4 Students will demonstrate an understanding of the use of object hierarchy in graphics applications.

CO 5 Students will write programs that demonstrate computer graphics animation.

CO 6 Students will write programs that demonstrate 2D image processing techniques.

UNIT -1 Graphics Primitives: Algorithms for drawing Line, circle, ellipse, arcs & sectors, Boundary Fill & Flood Fill algorithm, 9
Transformations: 2D & 3D Scaling, Translation, rotation, shearing & reflection, Composite transformation, Window to View port transformation.

UNIT-2 Clipping: Cohen Sutherland, Liang Barsky, Nicholl - Lee - Nicholl Line clipping algorithms, Sutherland Hodgeman Polygon clipping algorithm. 9
Three Dimensional Object Representations: 3D Modeling transformations, Parallel & Perspective projection ,

Unit-3 Curved lines & Surfaces, Spline representations, Spline specifications, Bezier Curves & surfaces, B-spline curves & surfaces, Rational splines, Displaying Spline curves & surfaces. 9

Unit-4 Basic Rendering: Rendering in nature, Polygonal representation, Affine and coordinate system transformations, Visibility and occlusion, depth buffering, Painter's algorithm, ray 9

	tracing, forward and backward rendering equations.	
Unit-5	Visualization: Visualization of 2D/3D scalar fields: color mapping, isosurfaces. Direct volume data rendering: ray-casting, transfer functions, segmentation. Visualization of: Vector fields and flow data, Time-varying data, High-dimensional data: dimension reduction, parallel coordinates, Non-spatial data: multi-variate, tree/graph structured, text Perceptual and cognitive foundations, Evaluation of visualization methods, Applications of visualization.	12
Total		48

Laboratory work: Lab work should be done in C Language. Covers all the basic drawing, filling, clipping, transformation and clipping algorithms, Spline generation, Projection etc.

Recommended Books:

1. Donald D Hearn, M. Pauline Baker, Computer Graphics C version, Pearson Education, 2nd ed.

2. OpenGL Programming Guide: The Official Guide to Learning OpenGL, Dave Shreiner, Mason Woo, Jackie Neider, Tom Davis, 5th Edition, 2013

3. James D. Foley, Andries van Dam, Steven K. Feiner and John F. Hughes, Computer Graphics: Principles & Practice in C, Addison Wesley Longman, 2nded.

4. Zhigang Xiang, Roy A Plastock, Computer Graphics, Schaums Outline, TMH, 2nd

Subject Name: DevOps on Cloud **Subject Code:** TMC 402(5)

Course Name: Master of Computer Applications (MCA)

1 Contact Hours: 45 **L** 3 **T** 0 **P** 0

2 Examination Duration(Hrs): **Theory** 0 3 **Practical** 0 0

3 Relative Weightage: **CWE:** 25 **MTE:** 25 **ETE:** 50

4 Credits: 0 3

5 Semester:

	*	
Autumn	**Spring**	**Both**

6 Pre-Requisite: Understanding of Cloud and cloud infrastructure and skill with a scripting language.

7 Subject Area: Computer Science

8 Objective: To make student understand Devops, its role in cloud computing with the help of use cases.

9 Course Outcome:

On completion of this course, the student should be able to

CO 1 Define and understand ideas of DevOps
CO 2 Describe and demonstrate how DevOps relate to working in the cloud
CO 3 Use a public/private cloud environment as a framework to examine the ideas of DevOps
CO 4 Examine some use cases, possible architectures, automation, continuous delivery, and the public/private cloud toolsets for DevOps.
CO 5 Implement the software engineering practices
CO 6 Analyze and implement continuous monitoring tools on Containers.

10 Details of the Course:

Unit No.	CONTENT	CONTACT HOURS
1	An introduction to Software Engineering, SDLC, Agile Framework, An introduction to DevOps, Gain insights of the DevOps environment, DevOps Vs Agile, DevOps Ecosystem	**9**
2	Version Control with Git, Install GIT and work with remote repositories, GIT workflows, Branching and Merging in Git. Understand the importance of Continuous Integration, Introduction to Jenkins, Jenkins management. Build and automation of Test using Jenkins and Maven.	**7**

3	Continuous Testing, learn and Install Selenium, create test cases in Selenium, Integrate Selenium with Jenkins, Continuous Deployment, Install and configure puppet, understand master-slave architecture of puppet.	**10**
4	Introduction to Docker, understanding images and containers, Docker Ecosystem, Introduction to Docker Networking, configuration management, configuration management with Ansible, Differentiate Ansible and Puppet.	**9**
5	Containerization using Kubernetes, Integrate Docker and Kubernetes, Auto- scaling, Continuous monitoring with Nagios, operate continuous monitoring tools, Implement Nagios commands.	**10**
	TOTAL	**45**

11 Suggested Books:

Sl. NO.	NAME OF AUTHERS/BOOKS/PUBLISHERS	YEAR OF PUBLICATION
1	Gene Kim and George Spafford ,"The Visible Ops Handbook by Kevin Behr", IT ProcessInstitute	**2010**
2	Michael Hüttermann ,"DevOps forDevelopers". O'Reilly Media	**2012**
3	Effective DevOps: Building a Culture of Collaboration, Affinity, and Tooling at Scale 1st Edition by Jennifer Davis	**2018**
4	The Goal: A Process of Ongoing Improvement by Eliyahu M. Goldratt ,Jeff Cox	**2014**

Course Name: Data Mining and Warehousing **Subject Code:** TMC 403(5)

Program Name: Master of Computer Application

1 Contact Hours: 45 **L** 3 **T** 0 **P** 0

2 Examination Duration(Hrs): **Theory** 0 3 **Practical** 0 0

3 Relative Weightage: **CWE:** 25 **MTE:** 25 **ETE:** 50

4 Credits: 0 4

5 Semester: ☐ **Autumn** ☑ **Spring** ☐ **Both**

6 Pre-Requisite: **Knowledge of DBMS**

7 Subject Area: **Computer Applications**

8 Objective: **To familiarize students with Data Warehousing and Data Mining.**

9 Course Outcomes: A student who successfully fulfills the course requirements will be able to:
Co 1. Discuss the role of data warehousing and enterprise intelligence in industry and government.
Co.2 Summarize the dominant data warehousing architectures and their support for quality attributes.
Co.3 Apply suitable pre-processing and visualization techniques for data analysis
Co.4 Taking cognizance of the contribution of paradigms from the fields of Artificial Intelligence and Machine learning.
Co.5 Compare and contrast the dominant data mining algorithms.
Co.6 Recognize and describe at least three computational approaches to data clustering.

10 Details of the Course:

Unit No.	CONTENT	CONTACT HOURS
1	**Introduction to Data Mining and Data Warehouse** Fundamentals of data mining, Data Mining Functionalities, Classification of Data Mining systems, Major issues in Data Mining. Data Warehousing: Overview, Definition, Data Warehousing	10

	Components, Building a Data Warehouse, Mapping the Data Warehouse to a Multiprocessor Architecture, Difference between Database System and Data Warehouse, Multi Dimensional Data Model, Data Cubes, Stars, Snow Flakes, Fact Constellations, Concept hierarchy, Process Architecture, 3 Tier Architecture, Data warehouse Measures, their categorization and computation, Operations in OLAP, Advantages of OLAP over OLTP.	
2	**Data Preprocessing** Need for preprocessing Descriptive data summarization, Data Cleaning: Missing Values, Noisy Data,(Binning, Clustering, Regression, Computer and Human inspection),Inconsistent Data, Data Integration and Transformation.	9
3	**Introduction to Data Mining** Introduction – Data – Types of Data – Data Mining Functionalities – Interestingness of Patterns – Classification of Data Mining Systems – Data Mining Task Primitives – Integration of a Data Mining System with a Data Warehouse – Issues. **Data Mining Techniques :** Association rules: Association rules from transaction database & relational database, Apriori algorithm and correlation analysis.	8
4	**Data Mining Techniques** Classification and predication, Issues related to classification & prediction, decision tree induction, Bayesian classification. Classification methods K-nearest neighbor classifiers. Introduction to Clustering techniques, Data types in cluster analysis, categories of clustering techniques: partition method, and Hierarchical method.	10
5	**Overview of Advanced Features of Data Mining** Mining complex data objects, Spatial databases, Multimedia databases, Time series and Sequence data; mining Text Databases and mining Word Wide Web.	8
	TOTAL	**45**

11 Suggested Books:

Sl. NO.	NAME OF AUTHERS/BOOKS/PUBLISHERS	YEAR OF PUBLICATION/REPRINT
1	Alex Berson and Stephen J. Smith, " Data Warehousing, Data Mining & OLAP", TataMcGraw – Hill Edition	2007
2	Jiawei Han and Micheline Kamber, "Data Mining Concepts and Techniques",Third Edition, Elsevier	2012