

## Syllabus

**Mumbai University  
Revised syllabus (Rev-2016) from Academic Year 2017-18**

### **Computer Graphics**

Course Code	Course Name	Credits
CSC604	Computer Graphics	4

#### **Course Objectives**

1. To equip students with the fundamental knowledge and basic technical competence in the field of computer graphics.
2. To emphasize on implementation aspect of Computer Graphics Algorithms.
3. To prepare the student for advance areas like Image Processing or Computer Vision or Virtual Reality and professional avenues in the field of Computer Graphics.

**Course Outcomes :** At the end of the course student should be able to

1. Understand the basic concepts of Computer Graphics.
2. Demonstrate various algorithms for scan conversion and filling of basic objects and their comparative analysis.
3. Apply geometric transformations, viewing and clipping on graphical objects.
4. Explore solid model representation techniques and projections.
5. Understand visible surface detection techniques and illumination models.

**Prerequisite :** Knowledge of C Programming, Basic Data Structures and Mathematics.

Module No.	Detail Syllabus	Hours
1.	<b>Introduction and Overview of Graphics System :</b> <ul style="list-style-type: none"><li>• Definition and Representative uses of computer graphics, classification of application areas, Overview of coordinate systems ,definition of scan conversion, rasterization and rendering.</li><li>• Raster scan &amp; random scan displays, Flat Panel displays like LCD and LED , architecture of raster graphics system with display processor, architecture of random scan systems.</li></ul> <p style="text-align: right;">(Refer Chapter 1)</p>	03
2.	<b>Output Primitives :</b> <ul style="list-style-type: none"><li>• Scan conversions of point,line, circle and ellipse : DDA algorithm and Bresenham algorithm for line drawing, midpoint algorithm for circle, midpoint algorithm for ellipse drawing ( Mathematical derivation for above algorithms is expected )</li><li>• Aliasing . Antialiasing techniques like Pre and post filtering , super sampling , and pixel phasing ).</li><li>• Filled Area Primitive: Scan line Polygon Fill algorithm, Inside outside tests, Bounded Fill and Flood fill algorithm.</li></ul> <p style="text-align: right;">(Refer Chapters 2 and 3)</p>	12

# Computer Graphics Techmax

**Robert D. Parslow**



## **Computer Graphics Techmax:**

*Confluence of Computer Vision and Computer Graphics* Ales Leonardis, F. Solina, Ruzena Bajcsy, 2000-09-30 A collection of original contributions by researchers who work at the forefront of a new field lying at the intersection of computer vision and computer graphics Several original approaches are presented to the integration of computer vision and graphics techniques to aid in the realistic modelling of objects and scenes interactive computer graphics augmented reality and virtual studios Numerous applications are also discussed including urban and archaeological site modelling modelling dressed humans medical visualisation figure and facial animation real time 3D teleimmersion telecollaboration augmented reality as a new user interface concept and augmented reality in the understanding of underwater scenes *Computer Graphics with An Introduction to Multimedia, 4th Edition* Chopra Rajiv, This well written textbook discusses the concepts principles and applications of Computer Graphics in a simple precise and systematic manner It explains how to manipulate visual and geometric information by using the computational techniques It also incorporates several experiments to be performed in computer graphics and multimedia labs *Computer Graphics*, **Computer Graphics**, 1977 Scientific and Technical Aerospace Reports, 1987-10 Computer Graphics and Multimedia Atul P. Godse, Dr. Deepali A. Godse, 2021-01-01 The book presents comprehensive coverage of Computer Graphics and Multimedia concepts in a simple lucid and systematic way It uses C programming language to implement various algorithms explained in the book The book is divided into two parts The first part focuses on a wide range of exciting topics such as illumination and colour models shading algorithms line curves circle and ellipse drawing algorithms polygon filling 2D and 3D transformations windowing and clipping 3D object representation 3D viewing viewing pipeline and visible surface detection algorithms The second part focuses on multimedia basics multimedia applications multimedia system architecture evolving technologies for multimedia defining objects for multimedia systems multimedia data interface standards multimedia databases compression and decompression data and file format standards multimedia I O technologies digital voice and audio video image and animation full motion video and storage and retrieval technologies It also describes multimedia authoring and user interface Hypermedia messaging mobile messaging integrated multimedia message standards integrated document management and distributed multimedia systems Case Study Blender graphics Blender fundamentals drawing basic shapes modelling shading and textures COMPUTER GRAPHICS AND APPLICATIONS Dennis Harris, 1986 Computer Graphics Richard D. Parslow, Robert Douglas Parslow, 1970 *Introduction to Computer Graphics* James D. Foley, Andries Van Dam, Steven Keith Feiner, John F. Hughes, Richard L. Phillips, 1997 Fundamentals of Computer Graphics Steve Marschner, Peter Shirley, 2021-09-30 Drawing on an impressive roster of experts in the field Fundamentals of Computer Graphics Fifth Edition offers an ideal resource for computer course curricula as well as a user friendly personal or professional reference Focusing on geometric intuition this book gives the necessary information for understanding how images get onto the screen by using the

complementary approaches of ray tracing and rasterization It covers topics common to an introductory course such as sampling theory texture mapping spatial data structure and splines It also includes a number of contributed chapters from authors known for their expertise and clear way of explaining concepts HIGHLIGHTS Major updates and improvements to numerous chapters including shading ray tracing physics based rendering math and sampling Updated coverage of existing topics The absorption and reworking of several chapters to create a more natural flow to the book The fifth edition of Fundamentals of Computer Graphics continues to provide an outstanding and comprehensive introduction to basic computer graphic technology and theory It retains an informal and intuitive style while improving precision consistency and completeness of material allowing aspiring and experienced graphics programmers to better understand and apply foundational principles to the development of efficient code in creating film game or web designs [A Practical Introduction to Computer Graphics](#) Ian O. Angell,1981 **Computer Graphics** ,1990 **Official Gazette of the United States Patent and Trademark Office** ,1998 **Computer Graphics** Francis S. Hill,1990 *Computer Graphics* Neeta Nain, This book adopts a conceptual approach to computer graphics with emphasis on mathematical concepts and their applications It introduces an abstract paradigm that relates the mathematical concepts with computer graphic techniques and implementation methods This model is intended to help the reader understand the mathematical concepts and their practical use However mathematical complexity has not been allowed to dominate The haul mark of the book is its profuse solved examples which aid in the understanding of mathematical concepts The text is supplemented with introduction to various graphics standards animation multimedia techniques and fractals These topics are of immense use in each of the three visual disciplines modeling transformations projections and multi view geometry for computer vision Geometry of lines vectors and planes is essential for any geometric computation problem light and illumination for image based rendering and hidden surface removal Almost every chapter has the working source code to illustrate the concepts which could be written and used as small programs for better understanding of the topics A concise appendix of open source OpenGL is also included to showcase programming concepts of computer graphics and visualization The text is completely platform independent and the only prerequisite is the knowledge of coordinate geometry and basic algebra It will be useful both as a text and reference thus it can easily be used by novices and experienced practitioners alike **Computer Graphics 80** ,1980 **Computer Graphics** Robert D. Parslow,2012-12-06 About four or five years ago one began to hear about the enormous interest being taken in on line consoles and displays Nothing much was done with them but computer men felt that this was the way computing ought to go one might dispense with cards and overcome many of the problems of man machine communication It quickly appeared that as with computers there had been a great under estimation of the amount of work involved of the difficulties of programming and of the cost So it began to emerge that graphics was not the ultimate answer in spite of superb demonstrations where one might watch a square being converted into a cube and then rotated But my

mind goes back to 1951 and the first computers There there were demonstrations of arithmetic speed and storage facility but not much idea of actual use However we now understand how to use computers and in the last year or two significant developments in the field of graphics have led to genuine applications and economic benefits The equipment is still expensive but it is becoming cheaper more uses are being found and I believe that we are just at the stage when the subject is gaining momentum to become like computers a field of immense importance

Computer Graphics - Technology and Applications  
,19?? *Computer Graphics* James D. Foley,1996 On computer graphics *Computer Graphics* R. Parslow,1969-04-01

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