



GALGOTIAS
UNIVERSITY

**School of Computing
Science and Engineering**

Program: B.Tech CSE -GG

Course Code: CSGG4021

Course Name: Introduction to Graphics
and Animation

Course Outcomes :

CO	Title
CO1	To understand the basics of computer graphics, different graphics systems ,applications of computer graphics and color theory.
CO2	To understand the various algorithms for scan conversion and two dimensional geometric transformations.
CO3	To apply the computer graphics concepts in the development of computer games, information visualization, and business applications and learn the use of OpenGL .
CO4	To implement and understand the basic concept of various open source graphics tools like GIMP and blender etc.
CO5	To evaluate and compare the various image compression techniques and implement basic 3D modeling techniques.

Course Prerequisites/Objective

The objective of this course is to:

- To learn the basic concepts of graphics design. This includes color theory and application of graphics design.
- Be able to discuss the application of computer graphics concepts in the development of computer games, information visualization, and business applications.
- To develop a facility with the relevant mathematics of computer graphics, e.g., 2D/3D rotations using both vector algebra, and transformations and projections using homogeneous coordinates.
- To learn the principles and commonly used paradigms and techniques of computer graphics, e.g., the graphics pipeline, and Bresenham's algorithm for speedy line and circle generation

UNIT-1

Introduction

Graphic Design Overview, Graphic Design as a discipline, evolution of Graphic Design – Emergence of the design industry, Twentieth century design; Applications of Graphic Design, Skills & Design Illustration, Importance of color in graphics, Things to consider while choosing color in layouts – Color theory: Primary color, secondary color, tertiary color, Knowledge of colors – Harmonious colors, Complimentary colors, Color Models: RGB, CMYK, HSV

Recap

Graphic Design

- Significance
- Scope
- Graphic Design Areas
- Software Used
- Graphic Designer Skills
- Career Options

Evolution (history) of Graphic Design

- The origins of graphic design can be traced from the origins of human existence, from the caves of [Lascaux](#), to Rome's [Trajan's Column](#) to the [illuminated manuscripts](#) of the Middle Ages, to the neon lights of [Ginza, Tokyo](#). In "Babylon, artisans pressed cuneiform inscriptions into clay bricks or tablets which were used for construction. The bricks gave information such as the name of the reigning monarch, the builder, or some other dignitary".^[2] This was the first known road sign announcing the name of the governor of a state or mayor of the city. The Egyptians developed communication by hieroglyphics that used picture symbols dating as far back as 136 B.C. found on the [Rosetta Stone](#). "The Rosetta stone, found by one of Napoleon's engineers was an advertisement for the Egyptian ruler, Ptolemy as the "true Son of the Sun, the Father of the Moon, and the Keeper of the Happiness of Men" ^[2] The Egyptians also invented [papyrus](#), paper made from reeds found along the [Nile](#), on which they transcribed advertisements more common among their people at the time. During the "[Dark Ages](#)", from 500 AD to 1450 AD, monks created elaborate, illustrated manuscripts.
- In both its lengthy history and in the relatively recent explosion of [visual communication](#) in the 20th and 21st centuries, the distinction between [advertising](#), art, graphic design and [fine art](#) has disappeared. They share many elements, theories, principles, practices, [languages](#) and sometimes the same benefactor or client. In advertising, the ultimate objective is the sale of goods and services. In graphic design, "the essence is to give order to information, form to ideas, expression, and feeling to artifacts that document human experience

Source : Wikipedia

History of Graphic Design Contd.

- Graphic design in the United States began with [Benjamin Franklin](#) who used his newspaper [The Pennsylvania Gazette](#), to master the art of publicity to promote his own books and to influence the masses. "Benjamin Franklin's ingenuity gained in strength as did his cunning and in 1737 he had replaced his counterpart in Pennsylvania, [Andrew Bradford](#) as postmaster and printer after a competition he instituted and won. He showed his prowess by running an ad in his *General Magazine and the Historical Chronicle of British Plantations in America* (the precursor to the [Saturday Evening Post](#)) that stressed the benefits offered by a stove he invented, named the *Pennsylvania Fireplace*. His invention is still sold today and is known as *the Franklin stove*. "^[4]
- American advertising initially imitated British newspapers and magazines. Advertisements were printed in scrambled type and uneven lines that made it difficult to read. Franklin better organized this by adding a 14-point type for the first line of the advertisement; although later shortened and centered it, making "headlines". Franklin added illustrations, something that London printers had not attempted. Franklin was the first to utilize [logos](#), which were early symbols that announced such services as opticians by displaying golden spectacles. Franklin taught advertisers that the use of detail was important in marketing their products. Some advertisements ran for 10-20 lines, including color, names, varieties, and sizes of the goods that were offered. [\[citation needed\]](#)

Source : Wikipedia

Nineteenth century

- In 1849, [Henry Cole](#) became one of the major forces in [design education](#) in Great Britain, informing the government of the importance of design in his *Journal of Design and Manufactures*. He organized the [Great Exhibition](#) as a celebration of modern industrial technology and Victorian design.
- From 1891 to 1896, [William Morris'](#) Kelmscott Press published some of the most significant of the graphic design products of the [Arts and Crafts movement](#), and made a lucrative business of creating and selling stylish books. Morris created a market for works of graphic design in their own right and a profession for this new type of art. The Kelmscott Press is characterized by an obsession with historical styles. This historicism was the first significant reaction to the state of nineteenth-century graphic design. Morris' work, along with the rest of the [Private Press](#) movement, directly influenced [Art Nouveau](#).^[6]

source: Wikipedia

Twentieth century

- In 1917, [Frederick H. Meyer](#), director and instructor at the [California School of Arts and Crafts](#), taught a class entitled "Graphic Design and Lettering".^[7] Raffe's *Graphic Design*, published in 1927, was the first book to use "Graphic Design" in its title.^[8]
- The signage in the [London Underground](#) is a classic design example^[9] of the [modern era](#). [Frank Pick](#) led the Underground Group design and publicity movement, even though he lacked artistic training. The first Underground station signs were introduced in 1908 with a design of a solid red disk with a blue bar in the center and the name of the station. The station name was in white sans-serif letters. It was in 1916 when Pick used the expertise of [Edward Johnston](#) to design a new typeface for the Underground. Johnston redesigned the Underground sign and logo to include his typeface on the blue bar in the center of a red circle.^[10]
- In the 1920s, Soviet [constructivism](#) applied 'intellectual production' in different spheres of production. The movement saw individualistic art as useless in revolutionary Russia and thus moved towards creating objects for [utilitarian](#) purposes. They designed buildings, theater sets, posters, fabrics, clothing, furniture, logos, menus, etc.^[citation needed]

source: Wikipedia

Twentieth century

- [Jan Tschichold](#) codified the principles of [modern typography](#) in his 1928 book, *New Typography*.^[11] He later repudiated the philosophy he espoused in this book as fascistic, but it remained influential.^[citation needed] Tschichold, [Bauhaus](#) typographers such as [Herbert Bayer](#) and [László Moholy-Nagy](#) and [El Lissitzky](#) greatly influenced graphic design. They pioneered production techniques^[citation needed] and stylistic devices used throughout the twentieth century. The following years saw graphic design in the modern style gain widespread acceptance and application.^[12]
- The post-World War II American economy revealed a greater need for graphic design, mainly in advertising and packaging. The spread of the German [Bauhaus](#) school of design to Chicago in 1937 brought a "mass-produced" minimalism to America; sparking "modern" [architecture](#) and design. Notable names in mid-century modern design include [Adrian Frutiger](#), designer of the [typefaces Univers](#) and [Frutiger](#); [Paul Rand](#), who took the principles of the Bauhaus and applied them to popular advertising and logo design, helping to create a uniquely American approach to European minimalism while becoming one of the principal pioneers of [corporate identity](#), a subset of graphic design. [Alex Steinweiss](#) is credited with the invention of the album cover; and [Josef Müller-Brockmann](#), who designed posters in a severe yet accessible manner typical of the 1950s and 1970s era.
- The professional graphic design industry grew in parallel with [consumerism](#). This raised concerns and criticisms, notably from within the graphic design community with the [First Things First manifesto](#). First launched by [Ken Garland](#) in 1964, it was re-published as the [First Things First 2000 manifesto](#) in 1999 in the magazine [Emigre](#) 51^[13] stating "We propose a reversal of priorities in favor of more useful, lasting and democratic forms of communication - a mindshift away from product marketing and toward the exploration and production of a new kind of meaning. The scope of debate is shrinking; it must expand. Consumerism is running uncontested; it must be challenged by other perspectives expressed, in part, through the visual languages and resources of design."^[14] Both editions attracted signatures from practitioners and thinkers such as [Rudy VanderLans](#), [Erik Spiekermann](#), [Ellen Lupton](#) and [Rick Poyner](#). The 2000 manifesto was also published in [Adbusters](#), known for its strong critiques of visual culture.

source: Wikipedia

Applications of Graphic Design

- Graphic design is applied to everything visual, from [road signs](#) to technical schematics, from interoffice [memorandums](#) to reference [manuals](#).
- Design can aid in selling a [product](#) or [idea](#). It is applied to products and elements of company identity such as [logos](#), colors, [packaging](#) and text as part of [branding](#) (see also [advertising](#)). Branding has become increasingly more important in the range of services offered by graphic designers. Graphic designers often form part of a branding team.
- Graphic design is applied in the [entertainment](#) industry in decoration, scenery and visual story telling. Other examples of design for entertainment purposes include novels, vinyl [album covers](#), comic books, DVD covers, [opening credits](#) and [closing credits](#) in [filmmaking](#), and programs and props on stage. This could also include artwork used for T-shirts and other items screenprinted for sale.
- From scientific journals to news reporting, the presentation of opinion and facts is often improved with graphics and thoughtful compositions of visual information - known as [information design](#). Newspapers, magazines, blogs, television and film documentaries may use graphic design. With the advent of the web, information designers with experience in interactive tools are increasingly used to illustrate the background to news stories. Information design can include [data visualization](#), which involves using programs to interpret and form data into a visually compelling presentation, and can be tied in with [information graphics](#).

source: Wikipedia

Skills & Design Illustrations

Skills

- A graphic design project may involve the stylization and presentation of existing [text](#) and either preexisting [imagery](#) or images developed by the graphic designer. Elements can be incorporated in both traditional and digital form, which involves the use of visual arts, typography, and page layout techniques. Graphic designers organize pages and optionally add graphic elements. Graphic designers can commission photographers or illustrators to create original pieces. Designers use digital tools, often referred to as [interactive design](#), or [multimedia](#) design. Designers need communication skills to convince an audience and sell their designs.
- The "process school" is concerned with communication; it highlights the channels and media through which messages are transmitted and by which senders and receivers encode and decode these messages. The semiotic school treats a message as a construction of signs which through interaction with receivers, produces meaning; communication as an agent.

source: Wikipedia

Skills & Design Illustrations

Design

Interface design[[edit](#)]

- [User interface design](#)
- Since the advent of personal computers, many graphic designers have become involved in [interface design](#), in an environment commonly referred to as a [Graphical User Interface](#) (GUI). This has included [web design](#) and [software design](#) when [end user-interactivity](#) is a design consideration of the layout or interface. Combining visual communication skills with an understanding of user interaction and online branding, graphic designers often work with [software developers](#) and [web developers](#) to create the [look and feel](#) of a web site or [software application](#). An important aspect of interface design is [icon design](#).
- **User experience design**[[edit](#)]
- User experience design (UX) is the study, analysis, and development of creating products that provide meaningful and relevant experiences to users. This involves the creation of the entire process of acquiring and integrating the product, including aspects of branding, design, usability, and function.
- **Experiential graphic design**[[edit](#)]
- Experiential graphic design is the application of communication skills to the built environment. This area of graphic design requires practitioners to understand physical installations that have to be manufactured and withstand the same environmental conditions as buildings. As such, it is a cross-disciplinary collaborative process involving designers, fabricators, city planners, architects, manufacturers and construction teams.
- Experiential graphic designers try to solve problems that people encounter while interacting with buildings and space (also called environmental graphic design). Examples of practice areas for environmental graphic designers are [wayfinding](#), [placemaking](#), branded environments, exhibitions and museum displays, public installations and digital environments.

source: Wikipedia

Skills needed by Graphic Illustrator

[Graphics illustration industry](#), like most creative industries, is constantly changing because of changing consumer tastes and emerging software technology. Graphic illustrators need to stay at the forefront of new trends and constantly upgrade their skills to meet the challenges of the evolving market. Besides the ability to constant reinvent, graphic illustrators should also have the following basic skill set.

- **Typography**
- Typography is the art and technique of arranging type and it is central to the work that a graphic illustrator does. Typography is not just about making the words legible, a graphic illustrator must understand the fundamental concepts of typography and apply it such that the choice of typeface synchronises with the design and colour scheme. Mastering the typography techniques can make a good illustrator into a great illustrator. Using the typography tutorials to help with the basics and using this knowledge to fine tune creative intuition is the best way forward for [graphic illustrators](#).
- **Generation of Ideas**
- Like any other profession, graphic illustrators need to have an innovative approach towards their work in order to achieve professional success. Ability to think up creative ideas and a clear plan to translate those ideas into reality is an essential skill for career growth. Graphic illustrators need to develop their creative skills with reading and by collaborating with other creative thinkers.
- **Social Network**
- Building up a good set of interpersonal skills and a solid social network is the key to a sustainable career as a graphic illustrator. Building positive relationships is important both personally and professionally for a graphic illustrator. Many illustrators are self-employed and therefore, work alone. A good social network not only provides support and feedback on your work, it also helps in making fresh contacts and drumming up business. It is necessary for [graphic illustrators](#) to attend seminars and networking events and to carry contact information when they go to meet people.
- **Business Skills**
- The last essential skill set for a design illustrator is business savvy. An illustrator must have adequate knowledge of management, finance and marketing in order to build up a successful career or business. In addition, an ability to understand customer challenges and ensure customer satisfaction is important because a loyal and stable customer base is the foundation of all successful businesses.



Thank You