DEPARTMENT OF COMPUTER APPLICATIONS
NATIONAL INSTITUTE OF TECHNOLOGY-TIRUCHIRAPPALLI

COURSE PLAN – PART I			
Name of the programme and specialization	**MCA- COMPUTER APPLICATIONS**		
Course Title	**GRAPHICS AND MULTIMEDIA**		
Course Code	**CA723**	**No. of Credits**	**3**
Course Code of Pre-requisite subject(s)	**Nil**		
Session	**July 2018**	**Section (if, applicable)**	**A & B**
Name of Faculty	**Dr. C. Sivaraj**	**Department**	**Computer Applications**
E-mail	**sivaraj@nitt.edu**	**Telephone No.**	**7339431431**
Name of Course Coordinator(s) (if, applicable)	**Dr. S. Domnic**		
E-mail	**domnic@nitt.edu**	**Telephone No.**	
Course Type	**Core course**		

Syllabus (approved in BoS)

Display Devices – Interactive Input devices – Graphics – Bresenham's Line Drawing Algorithm – DDA Algorithm – Comparison of Line Drawing Algorithms – Circle Drawing Algorithm

Two-dimensional Transformations – Scan Conversion Algorithms – Windowing – Clipping – Segmenting – Viewport Transformations

3D Concepts - Projections – Parallel Projection - Perspective Projection – Visible Surface Detection Methods - Three-dimensional Transformations –Visualization and polygon rendering - Hidden Surface Elimination Algorithms

Multimedia hardware & software - Components of multimedia – Text, Image – Graphics – Audio – Video – Animation – Authoring. Color models – XYZ-RGB-YIQ-CMY-HSV Models

Multimedia communication systems – Multimedia Information Retrieval – Video conferencing – Virtual reality

COURSE OBJECTIVES

➜ *To understand the basic concepts of graphics and multimedia systems.*
➜ *To acquire skills, to be conversant with technology and to assimilate formal concepts to solve a wide range of graphic design problems.*
➜ *To understand the Two and Three dimensional transformations and clippings*
➜ *To become familiar with creation and implementation of multimedia standards and techniques.*

COURSE OUTCOMES (CO)

➜ *Obtain insight into the basics of computer graphics and multimedia*
➜ *Understand the basic structure and working principles of computer graphics systems*
➜ *Know the concepts of two and three dimensional transformations and clippings procedures*
➜ *Know the concepts of three dimensional viewing and rendering methods*
➜ *Work on graphics tools and algorithms*

5. COURSE OUTCOME (CO)	Aligned Programme Outcome (PO)											
	PO-1	PO-2	PO-3	PO-4	PO-5	PO-6	PO-7	PO-8	PO-9	PO-10	PO-11	PO-12
Obtain insight into the basics of computer graphics and multimedia	H	M										
Understand the basic structure and working principles of computer graphics systems	H	H	H		M							
Know the concepts of two and three dimensional transformations and clippings procedures	H	H	H		M							
Know the concepts of three dimensional viewing and rendering methods	H	M			H							
Work on graphics tools and algorithms			M				H	H		M		

COURSE PLAN – PART II

COURSE OVERVIEW

Today, computer graphics is a central part of our lives, in movies, games, computer-aided design, virtual reality, virtual simulators, visualization and even imaging products and cameras. The goal of this course is to provide an introduction to the theory and practice of computer graphics. The course will assume a good background in programming in C or C++ and a background in mathematics including familiarity with the theory and use of coordinate geometry and of linear algebra such as matrix multiplication. This course will focus on the theoretical aspects and implementation of computer graphics using C and OpenGL.

COURSE TEACHING AND LEARNING ACTIVITIES

Week	#Class	Topic	Mode of Delivery
1	Class I	Overview of Graphics Systems	Power point presentation
	Class II	Video Display Devices introduction	Power point presentation
	Class III	CRT monitors working principle, Flat-panel display devices	Power point presentation
2	Class I	Types of Input Devices	Power point presentation
	Class II	Types of Hard Copy Devices, Graphics Software.	Power point presentation
	Class III	Points and Lines, DDA line drawing algorithm	Power point presentation
3	Class I	Bresenham's Line Drawing Algorithm Comparison of Line Drawing Algorithms	Power point presentation
	Class II	Mid-point line drawing algorithm	Power point presentation
	Class III	Circle generating algorithms	Power point presentation
4	Class I	Basic transformations (translation, scaling)	Talk, Chalk, Power point presentation
	Class II	Basic transformations (rotation), composite transformations	Talk, Chalk,
	Class III	Other Transformations	Talk, Chalk, Power point presentation
5	Class I	Scan Conversion Algorithms	Talk, Chalk, Power point presentation
	Class II	Window–to-Viewport coordinate Transformation	Talk, Chalk
	Class III	Clipping Operations, line clipping algorithms	Power point presentation
6	Class I	Polygon clipping algorithms	Talk, Chalk, Power point presentation

	Class II	Three dimensional geometric and modeling transformations	Talk, Chalk, Power point presentation
	Class III	Projections: Parallel Projection, Perspective Projection	Power point presentation
7	Class I	Visible-surface Detection methods	Talk, Chalk, Power point presentation
	Class II	Visualization & polygon rendering methods	Talk, Chalk, Power point presentation
	Class III	Student seminar on graphics tools and techniques	Talk, Chalk, Power point presentation
8	Class I	Hidden Surface Elimination Algorithms	Talk, Chalk
	Class II	Multimedia hardware & software	Talk, Chalk, Power point presentation
	Class III	Multimedia File Handling- Using text in Multimedia-Computer and Text	Talk, Chalk
	Class IV	Student seminar on multimedia tools and trends	Talk, Chalk, Power point presentation
9	Class I	Components of multimedia: Text, Font Editing and Design Tools	Talk, Chalk, Power point presentation
	Class II	Components of multimedia: Image – Graphics – Audio – Video – Animation – Authoring. (introduction)	Talk, Chalk, Power point presentation
	Class III	Color models – XYZ-RGB-YIQ-CMY-HSV Models	Talk, Chalk, Power point presentation
	Class IV	Multimedia communication systems	Talk, Chalk, Power point presentation
10	Class I	Multimedia Information Retrieval	Talk, Chalk, Power point presentation
	Class II	Video conferencing	Talk, Chalk, Power point presentation
	Class III	Virtual reality	Talk, Chalk, Power point presentation

COURSE ASSESSMENT METHODS				
S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Test 1	4th week	60 Minutes	20%
2	Test 2	10th week	60 Minutes	20%
3	Assignment/Seminar	7th week to 10th Week	6 days	10%
4	Semester Exam	April	180 Minutes	50%

ESSENTIAL READINGS : Textbooks, reference books, etc
1. Donald Hearn and Pauline Baker, "Computer Graphics C version", Pearson Education, 2003. 2. Foley Vandam and Feiner Huges, "Computer Graphics: Principles & Practice", Pearson Education, 2003. 3. Zhigang Xiang and Roy A Plastock, "Schaum's Outline of Computer Graphics", TMH 2000. 4. Tay Vaughan, "Multimedia: Making It Work", 7th Edition, Tata Mc-Graw Hill, 2008. 5. John F.Koegel Buford, "Multimedia Systems", Pearson Education, 2003. 6. Ranjan Parekh, "Principles of Multimedia", TMH, 2006. 7. Ralf Steinmetz and Klara Nahrstedt, "Multimedia: Computing, Communication and Applications", Pearson Education, 2001.

COURSE EXIT SURVEY (mention the ways in which the feedback about the course is assessed and indicate the attainment also)
1. The students through the class rep may give their feedback at any time to the course coordinator which will be duly addressed. 2. The students may also give their feedback during Class Committee meeting. 3. 'Course Outcome Survey' form will be distributed on the last working day to all the students and the feedback on various rubrics will be analyzed. 4. The COs will be computed after arriving at the final marks.

COURSE POLICY (including plagiarism, academic honesty, attendance, etc.)

At classes:

Interactive and productive interactions are anticipated. Abusive terms are highly restricted. Attendance is noted for every class. Appreciate if they are willing to prepare for placement and participating social services after informing properly to the department.

Exam Policy:

Exams are equal to all the students. No privileges will be given to any one at any cost. Students who are all absent for both the cycle test for a genuine reason may be given CPA . Assignments and projects are mandatory and should be submitted by the notification of the teacher.

Basic Policies on dishonest or Misconduct:

Students are encouraged to come with notebooks and encouraged to note down from teachers lecture. Asked to avoid electronic gadgets and unwanted notes at the time of examinations. Copying and re using existing notes for assignments are not appreciable.

Attendance Policy: (A uniform attendance policy as specified below shall be followed)

- At least 75% attendance in each course is mandatory.
- A maximum of 10% shall be allowed under On Duty (OD) category.
- Students with less than 65% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' grade.

11. ADDITIONAL COURSE INFORMATION
The students can get their doubts clarified at any time with their faculty member with prior appointment.

For Senate's Consideration

C. Sivaraj
Course Faculty

Dr. S. Domnic
PAC-Chairperson

Dr. S.R. Balasundaram
HOD