



Course Specification

Course Name: [Computer Graphics - 2]

Course Code: IT332

I. Basic Course Information

Major or minor element of program: Major
Department offering the course: [Information Technology Department]

Academic level: [400 Level]
Semester in which course is offered: First (Fall) Semester
Course pre-requisite(s): [Computer Graphics– 1 (IT331)]

Credit Hours: 3
Contact Hours Through:

Lecture	Tutorial*	Practical*	Total
2.5	0.0	1.5	4.0

* 1.5 hours for **either** Tutorial or Practical

Approval date of course specification: September 2014

II. Overall Aims of Course

The objective of the course is understanding the essentials background of the Visible surface detection algorithms ; Reflection and illumination models ; Rendering algorithms for 3-D objects ; Parametric representation of 3-D objects ; Shadows algorithms ; 2-D texture mapping ; 3-D texture mapping ; Ray tracing ; Volume rendering ; Anti-Aliasing ; Introduction to fractals ; 3-D computer animation ; Color Space in Computer Graphics.]

III. Program ILOs covered by course

Program Intended Learning Outcomes (By Code)			
Knowledge & Understanding	Intellectual Skills	Professional Skills	General Skills
[K1,K17,K19,K20]	[I17,I18,I19]	[P14,P17,P18]	[G2,G7,G9]



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IV. Intended Learning Outcomes of Course (ILOs)

a. Knowledge and Understanding

On completing the course, students should be able to:

- K.1 Overview on Visible surface detection algorithms.
- K.2 Impart the Reflection and illumination models.
- K.3 Render algorithms for 3-D objects.
- K.4 Explain parametric representation of 3-D objects; 3-D computer animation; Color Space in Computer Graphics.
- K.5 Investigate: Shadows algorithms; 2-D texture mapping; 3-D texture mapping.
- K.6 Grasp: Ray tracing; Volume rendering; Anti-Aliasing.

b. Intellectual/Cognitive Skills

On completing the course, students should be able to:

- I.1 [Analyse visible surface detection algorithms, Rendering algorithms for 3-D objects; Shadows algorithms; 2-D texture mapping; 3-D texture mapping.
- I.2 Revise the underlying concepts of Applications of Computer Graphics.
- I.3 Design Three-D Modelling – in Java 3D.
- I.4 Analyse Image Processing, Analysis, and Comprehension.
- I.5 Develop some real projects (e.g.: animation and games).]

c. Practical/Professional Skills

On completing the course, students should be able to:

- P.1 [Implement learned 3D designing and developing concepts.
- P.2 Apply Java 3D programming.
- P.3 Design 2D and 3D Modeling – VRML.
- P.4 Apply OpenGL Programming.]

d. General and Transferable Skills

On completing the course, students should be able to:

- G.1 [Enhance team working skills.
- G.2 Solve practical problems.
- G.3 Design and implement of Three-D Modeling.
- G.4 Work with Open Source Software.]



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V. Course Matrix Contents

	Main Topics / Chapters	Duration (Weeks)	Course ILOs Covered by Topic (By ILO Code)			
			K & U	I.S.	P.S.	G.S.
1-	Introduction to Visible surface detection algorithms]	[1]	[K1]	[I1,I2,I4]	[]	[]
2-	Reflection and illumination models]	[2]	[K2]	[I1,I2,I4]	[]	[]
3-	Rendering algorithms for 3-D objects]	[1]	[K3]	[I1,I2,I3]	[P1,P2,P3]	[All]
4-	Parametric representation of 3-D objects]	[1]	[K4]	[I1,I2]	[P1,P2,P3]	[All]
5-	3-D computer animation]	[1]	[K4]	[I2,I3,I4]	[All]	[All]
6-	Color Space in Computer Graphics]	[2]	[K4]	[I1,I2]	[All]	[All]
7-	Shadows algorithms]	[1]	[K5]	[I1,I2]	[All]	[All]
8-	2-D texture mapping]	[1]	[K5]	[I1,I2]	[All]	[All]
9-	3-D texture mapping]	[1]	[K5]	[I1,I2,I5]	[All]	[All]
10-	Ray tracing]	[1]	[K6]	[I1,I2,I5]	[]	[All]
11-	Volume rendering ; Anti-Aliasing]	[1]	[K6]	[I1,I2]	[]	[All]
	Net Teaching Weeks	13				

VI. Course Weekly Detailed Topics / hours / ILOs

Week No.	Sub-Topics	Total Hours	Contact Hours	
			Theoretical Hours	Practical Hours*
1	Introduction to Visible surface detection algorithms]	[2.5]	[2.5]	
2	Reflection and illumination models]	[4]	[2.5]	[1.5]
3	Reflection and illumination models]	[4]	[2.5]	[1.5]
4	Rendering algorithms for 3-D objects]	[4]	[2.5]	[1.5]
5	Parametric representation of 3-D objects]	[4]	[2.5]	[1.5]
6	3-D computer animation]	[4]	[2.5]	[1.5]
7	Midterm Exam			
8	Color Space in Computer Graphics - 1]	[4]	[2.5]	[1.5]
9	Color Space in Computer Graphics - 2]	[4]	[2.5]	[1.5]
10	Shadows algorithms]	[4]	[2.5]	[1.5]
11	2-D texture mapping]	[4]	[2.5]	[1.5]
12	3-D texture mapping]	[4]	[2.5]	[1.5]
13	Ray tracing]	[4]	[2.5]	[1.5]
14	Volume rendering ; Anti-Aliasing]	[4]	[2.5]	[1.5]
15	Final Exam			
Total Teaching Hours		51	33	18

* No Practical/Tutorial during the first week of the semester



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VII. Teaching and Learning Methods

Teaching/Learning Method	Selected Method	Course ILOs Covered by Method (By ILO Code)			
		K & U	Intellectual Skills	Professional Skills	General Skills
Lectures & Seminars	<input checked="" type="checkbox"/>	[K1,K2,K3,K4]	[I1]	[]	[]
Tutorials	<input checked="" type="checkbox"/>	[K5,K6]	[]	[]	[]
Computer lab Sessions	<input checked="" type="checkbox"/>	[]	[I2,I3]	[P1,P2]	[]
Practical lab Work	<input checked="" type="checkbox"/>	[]	[I2,I3]	[P1,P2]	[G2,G3]
Reading Materials	<input checked="" type="checkbox"/>	[K1,K2,K3,K4]	[I1,I2]	[]	[]
Web-site Searches	<input checked="" type="checkbox"/>	[]	[I4,I5]	[P3,P4]	[]
Research & Reporting	<input type="checkbox"/>	[]	[]	[]	[]
Problem Solving / Problem-based Learning	<input type="checkbox"/>	[]	[]	[]	[]
Projects	<input type="checkbox"/>	[]	[]	[]	[]
Independent Work	<input checked="" type="checkbox"/>	[]	[I1,I2,I3]	[]	[G2,G3]
Group Work	<input checked="" type="checkbox"/>	[]	[I2,I3]	[]	[G1,G2,G3]
Case Studies	<input checked="" type="checkbox"/>	[]	[]	[]	[G4]
Presentations	<input type="checkbox"/>	[]	[]	[]	[]
Simulation Analysis	<input type="checkbox"/>	[]	[]	[]	[]
Others (Specify):	<input type="checkbox"/>	[]	[]	[]	[]

VIII. Assessment Methods, Schedule and Grade Distribution

Assessment Method	Selected Method	Course ILOs Covered by Method (By ILO Code)				Assessment Weight / Percentage	Week No.
		K & U	I.S.	P.S.	G.S.		
Midterm Exam	<input checked="" type="checkbox"/>	[K1,K2,K3,K4]	[I1,I2,I3]	[]	[]	[10%]	7
Final Exam	<input checked="" type="checkbox"/>	[K1,K2,K3,K4]	[I1,I2,I3]	[]	[]	60%	14
Quizzes	<input checked="" type="checkbox"/>	[K5,K6]	[I4,I5]	[]	[]	[5%]	[2,8]
Course Work	<input type="checkbox"/>	[]	[]	[]	[]	[]	[]
Report Writing	<input checked="" type="checkbox"/>	[]	[]	[P3]	[G4]	[5%]	[10]
Case Study Analysis	<input checked="" type="checkbox"/>	[]	[]	[]	[G2,G3]	[5%]	[11]
Oral Presentations	<input checked="" type="checkbox"/>	[]	[]	[P2,P3,P4]	[]	[5%]	[12]
Practical	<input checked="" type="checkbox"/>	[]	[I2,I3]	[P1,P2]	[G2,G3]	[5%]	[12]
Group Project	<input checked="" type="checkbox"/>	[]	[I2,I3]	[P1,P2]	[G1,G2,G3]	[5%]	[13]
Individual Project	<input type="checkbox"/>	[]	[]	[]	[]	[]	[]
Others (Specify):	<input type="checkbox"/>	[]	[]	[]	[]	[]	[]



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IX. List of References

Essential Text Books	<ul style="list-style-type: none">• [Hesham N. Elmahdy, "Internet Technology: Developing Web/WAP Enabled Application ," ISBN: 977-17-3950-6, Helwan University Press, 2006.]
Course notes	<ul style="list-style-type: none">• [http://www.h-elmahdy.net/it223]
Recommended books	<ul style="list-style-type: none">• [Donald Hearn, M. Pauline Baker, "Computer Graphics with OpenGL, 3/E," ISBN: 0-13-015390-7, Prentice Hall, 2004.]
Periodicals, Web sites, etc ...	<ul style="list-style-type: none">• [http://www.h-elmahdy.net/graphics]

X. Facilities required for teaching and learning

<p>List the facilities required</p> <ul style="list-style-type: none">• White board• Data show• Computers lab.]

Course coordinator: Prof. Hesham N. Elmahdy

Head of Department: Prof. Reda Abd elwahab

Date: September 2014