

PURDUE UNIVERSITY
REQUEST FOR ADDITION, EXPIRATION,
OR REVISION OF AN UNDERGRADUATE COURSE
(10000-40000 LEVEL)

Print Form

EFD 54-10

DEPARTMENT School of Electrical and Computer Engineering (EFD 54-10) EFFECTIVE SESSION ~~Fall 2011~~ SUMMER 2012 (201230)

INSTRUCTIONS: Please check the items below which describe the purpose of this request.

- | | |
|---|---|
| <input checked="" type="checkbox"/> 1. New course with supporting documents | <input type="checkbox"/> 7. Change in course attributes (department head signature only) |
| <input type="checkbox"/> 2. Add existing course offered at another campus | <input type="checkbox"/> 8. Change in instructional hours |
| <input type="checkbox"/> 3. Expiration of a course | <input type="checkbox"/> 9. Change in course description |
| <input type="checkbox"/> 4. Change in course number | <input type="checkbox"/> 10. Change in course requisites |
| <input type="checkbox"/> 5. Change in course title | <input type="checkbox"/> 11. Change in semesters offered (department head signature only) |
| <input type="checkbox"/> 6. Change in course credit/type | <input type="checkbox"/> 12. Transfer from one department to another |

PROPOSED: Subject Abbreviation <u>ECE</u> Course Number <u>30834</u> Long Title <u>Fundamentals of Computer Graphics</u> Short Title <u>Fund of Computer Graphics</u>	EXISTING: Subject Abbreviation _____ Course Number _____	TERMS OFFERED Check All That Apply: <input type="checkbox"/> Summer <input checked="" type="checkbox"/> Fall <input type="checkbox"/> Spring
Abbreviated title will be entered by the Office of the Registrar if omitted. (30 CHARACTERS ONLY)		CAMPUS(ES) INVOLVED <input type="checkbox"/> Calumet <input type="checkbox"/> N. Central <input type="checkbox"/> Cont Ed <input type="checkbox"/> Tech Statewide <input type="checkbox"/> Ft. Wayne <input checked="" type="checkbox"/> W. Lafayette <input type="checkbox"/> Indianapolis

CREDIT TYPE 1. Fixed Credit: Cr. Hrs. <u>3</u> 2. Variable Credit Range: Minimum Cr. Hrs. _____ (Check One) To <input type="checkbox"/> Or <input type="checkbox"/> Maximum Cr. Hrs. _____ 3. Equivalent Credit: Yes <input type="checkbox"/> No <input type="checkbox"/>	COURSE ATTRIBUTES: Check All That Apply 1. Pass/Not Pass Only <input type="checkbox"/> 2. Satisfactory/Unsatisfactory Only <input type="checkbox"/> 3. Repeatable <input type="checkbox"/> Maximum Repeatable Credit: _____ 4. Credit by Examination <input type="checkbox"/> 5. Special Fees <input type="checkbox"/> 6. Registration Approval Type Department <input checked="" type="checkbox"/> Instructor <input type="checkbox"/> 7. Variable Title <input type="checkbox"/> 8. Honors <input type="checkbox"/> 9. Full Time Privilege <input type="checkbox"/> 10. Off Campus Experience <input type="checkbox"/>
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Schedule Type	Minutes Per Mtg	Meetings Per Week	Weeks Offered	% of Credit Allocated
Lecture	50	3	16	100
Recitation				
Presentation				
Laboratory				
Lab Prep				
Studio				
Distance				
Clinic				
Experiential				
Research				
Ind. Study				
Pract/Observ				

Cross-Listed Courses
CS 33400
RECEIVED
JAN 23 AM 10:02
OFFICE OF THE REGISTRAR

COURSE DESCRIPTION (INCLUDE REQUISITES/RESTRICTIONS):
See attachment.

***COURSE LEARNING OUTCOMES:**
See attachment.

Calumet Department Head _____ Date _____	Calumet School Dean _____ Date _____
Fort Wayne Department Head _____ Date _____	Fort Wayne School Dean _____ Date _____
Indianapolis Department Head _____ Date _____	Indianapolis School Dean _____ Date _____
North Central Department Head _____ Date _____	North Central Chancellor _____ Date _____
West Lafayette Department Head _____ Date _____	West Lafayette College/School Dean _____ Date _____
	West Lafayette Registrar _____ Date _____

OFFICE OF THE REGISTRAR

LD
1/25/12

Form 40 Attachments

School of Electrical and Computer Engineering (EFD 54-10)

Description: Fundamental principles and techniques of computer graphics. The course covers the basics of going from a scene representation to a raster image using OpenGL. Specific topics include coordinate manipulations, perspective, basics of illumination and shading, color models, texture maps, clipping and basic raster algorithms, fundamentals of scene constructions.

Restrictions: Must be enrolled in the School of Electrical and Computer Engineering

Prerequisites: ECE 36800

Course Learning Outcomes:

- i. an understanding of the design issues for creating raster graphics.
- ii. an ability to apply rendering techniques to an actual computer graphics problem and associated datasets.
- iii. an understanding of object transformations, representations, transformations and perspective projections.
- iv. an understanding of color, illumination, and shading techniques.
- v. an understanding of the rendering and rasterization techniques.
- vi. an understanding of the application of computer graphics techniques to visualization, animation, and computer aided design.

TO: The Faculty of the College of Engineering

FROM: The Faculty of the School of Electrical and Computer Engineering

RE: New Undergraduate Course: ECE 30834, Fundamentals of Computer Graphics
(Cross-listed with CS 33400)

The faculty of the School of Electrical and Computer Engineering has approved the following new course. This action is now submitted to the Engineering Faculty with a recommendation for approval.

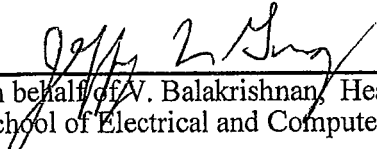
ECE 30834 Fundamentals of Computer Graphics
Sem. Fall, Spring; Cr. 3, Lecture 3

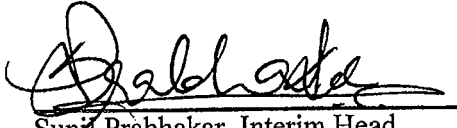
Prerequisites: ECE 36800

Restrictions: Must be enrolled in: School of Electrical and Computer Engineering

Description: Fundamental principles and techniques of computer graphics. The course covers the basics of going from a scene representation to a raster image using OpenGL. Specific topics include coordinate manipulations, perspective, basics of illumination and shading, color models, texture maps, clipping and basic raster algorithms, fundamentals of scene constructions.

Reason: The experimental version of this course (ECE 495E/49500) has been offered jointly with Computer Science (cross-listed with CS 33400) in Fall 2003, Spring 2004, Fall 2004, Fall 2006, Spring 2007, Spring 2008, Fall 2008, Spring 2009, Fall 2009 (15 enrolled), Spring 2010 (21 enrolled), and Fall 2010 (17 enrolled). This course is a popular computer engineering elective for BSCmpE students.


on behalf of V. Balakrishnan, Head
School of Electrical and Computer Engineering


Sunil Prabhakar, Interim Head
Department of Computer Science

APPROVED FOR THE FACULTY
OF THE SCHOOLS OF ENGINEERING
BY THE ENGINEERING
CURRICULUM COMMITTEE

ECC Minutes # 6

Date 10/31/2011

Chairman ECC R. Cipra

ECE 30834 - Fundamentals of Computer Graphics

Lecture Hours: 3.0 Credits: 3.0

Requisites:

ECE 36800

Requisites by Topic:

Programming, Data Structures

Catalog Description:

This course will cover basic and advanced principles of interactive computer graphics: raster graphics, color models, anti-aliasing and texture, image-space and object-space methods, 3D homogeneous coordinates, perspective, illumination models, depth cueing, hidden line elimination, morphing and other techniques.

Supplementary Information:

Spring 2009 CRN 17254

Required Text(s):

1. *Interactive Computer Graphics: A Top Down Approach Using OpenGL*, 3rd Edition, Ed Angel, Addison-Wesley, 2002, ISBN No. 0-20-185571-2.

Recommended Text(s): None.

Course Outcomes:

A student who successfully fulfills the course requirements will have demonstrated:

- i. an understanding of the design issues for creating raster graphics. [1,4; b,c,j]
- ii. an ability to apply rendering techniques to an actual computer graphics problem and associated datasets. [1,3,4; a,c,e,k]
- iii. an understanding of object transformations, representations, transformations and perspective projections. [1,2,3,4; a]
- iv. an understanding of color, illumination, and shading techniques. [1,3,4; a]
- v. an understanding of the rendering and rasterization techniques. [1,3,4; a]
- vi. an understanding of the application of computer graphics techniques to visualization, animation, and computer aided design. [7; j,k]

Assessment Method for Course Outcomes: The course outcomes will be assessed through student submission of working programs, and two in class examinations.

Lecture Outline:

Supporting Documentation EFD 54-10

Week(s)	Topics
1-2	Brief overview of computer graphics and architecture (rendering pipeline), graphics software, and graphics applications. Introduction to the OpenGL library, example programs.
3	Raster basics: drawing lines and circles, clipping algorithms, polygon intersection. Alias effects, techniques to counter them.
4-5	From scene to image: Objects, transforms, color and illumination models, polygonal object representation, texture maps, view port clipping, rasterization.
6-7	Perspective and projection, affine and projective coordinates, rigid body motions. Object manipulation, concepts from projective geometry.
8-9	Color perception and color models, local illumination, ambient, diffuse and specular light models. Material properties. Gouraud and Phong shading.
10-11	Basic ray tracing, direct and indirect illumination, reflection and refraction. Constructive Solid Geometry (CSG), ray tracing CSG models.
12-13	Object geometry: polygon mesh, implicit surfaces, parametric curves and surfaces. Modeling with implicit surfaces. Construction of polygon meshes.
14-15	Survey of basic tools and techniques for animation, scientific visualization, and computer-aided design.

Engineering Design Content:

Analysis
Construction
Testing

Supporting Documentation for EFD 54-10

CS 33400 - Fundamentals Of Computer Graphics

Credit Hours: 3.00. Fundamental principles and techniques of computer graphics. The course covers the basics of going from a scene representation to a raster image using OpenGL. Specific topics include coordinate manipulations, perspective, basics of illumination and shading, color models, texture maps, clipping and basic raster algorithms, fundamentals of scene constructions. C S 314 is recommended. Typically offered Fall.

0.000 OR 3.000 Credit hours

Levels: Graduate, Professional, Undergraduate

Schedule Types: Distance Learning, Lecture, Practice Study Observation

All Sections for this Course

Offered By: College of Science

Department: Computer Science

Course Attributes:

CH Technical Electives, Upper Division

May be offered at any of the following campuses:

West Lafayette

Restrictions:

Must be enrolled in one of the following Programs:

Computer Science-BS

Elect Comp Engr-BSE

Computer Engr-BSE

Prerequisites:

(Undergraduate level MA 26500 Minimum Grade of D- or Undergraduate level MA 35000 Minimum Grade of D- or Undergraduate level MA 35100 Minimum Grade of D-) and (Undergraduate level CS 24000 Minimum Grade of D- or (Undergraduate level ECE 26400 Minimum Grade of D- or Undergraduate level EE 26400 Minimum Grade of D-) and (Undergraduate level ECE 36800 Minimum Grade of D- [may be taken concurrently]) or Undergraduate level EE 36800 Minimum Grade of D-)