



El Camino College
COURSE OUTLINE OF RECORD – Approved

I. GENERAL COURSE INFORMATION

Subject and Number: Computer Aided Design/Drafting 37
Descriptive Title: Advanced CATIA Functions
Course Disciplines: Drafting
Division: Industry and Technology

Catalog Description:

This course covers wireframe and surface functionality using CATIA* software. Advanced Three Dimensional (3D) surface models are created, manipulated, analyzed and rendered. Additional instruction covers hybrid design utilizing solid and surface 3D models. (*CATIA is a registered trademark of Dassault Systems.)

Conditions of Enrollment:

Recommended Preparation: Computer Aided Design/Drafting 31

Course Length:	<input checked="" type="checkbox"/> Full Term	Other (Specify number of weeks):
Hours Lecture:	1.00 hours per week	TBA
Hours Laboratory:	3.00 hours per week	TBA
Course Units:	2.00	

Grading Method: Letter
Credit Status: Associate Degree Credit

Transfer CSU: Effective Date: 3/15/1999
Transfer UC: No

General Education:
El Camino College:

CSU GE:

IGETC:

II. OUTCOMES AND OBJECTIVES

A. COURSE STUDENT LEARNING OUTCOMES (The course student learning outcomes are listed below, along with a representative assessment method for each. Student learning outcomes are not subject to review, revision or approval by the College Curriculum Committee)

1. SLO #1 3-D Wireframe Modeling
Given a fully-dimensioned multi-view engineering drawing of a machined part, the student will be able to utilize the appropriate functions within the CATIA V5 software to construct a 3-D wireframe model of the part.
2. SLO #2 Utilizing Surfacing Functions
Given a fully dimensioned multi-view engineering drawing of a complex molded part, the student will be able to utilize the appropriate functions within the CATIA V5 software to construct a 3-D surface model of the part.
3. SLO #3 Joining Surfaces
Given a 3-D surface model of two separate surfaces of a complex molded part, the student will be able to utilize the appropriate functions within the CATIA V5 software to construct a third surface blending the original two. The new surface will be tangent continuous with both of the original surfaces.

The above SLOs were the most recent available SLOs at the time of course review. For the most current SLO statements, visit the El Camino College SLO webpage at <http://www.elcamino.edu/academics/slo/>.

B. Course Student Learning Objectives (The major learning objective for students enrolled in this course are listed below, along with a representative assessment method for each)

1. Create advanced 3D surface models.
Class Performance
2. Create hybrid models utilizing 3D solid geometry merged with surface geometry.
Performance exams
3. Utilize existing 3D geometry and modify properties to produce realistic images of parts and assemblies.
Class Performance
4. Perform logical and geometric analyzes of surface models.
Class Performance

III. OUTLINE OF SUBJECT MATTER (Topics are detailed enough to enable a qualified instructor to determine the major areas that should be covered as well as ensure consistency from instructor to instructor and semester to semester.)

Lecture or Lab	Approximate Hours	Topic Number	Major Topic
Lecture	1	I	ADVANCED CATIA OVERVIEW A. Skill requirements B. Software, lab functionality
Lab	2	II	ADVANCED CATIA OVERVIEW A. Skill requirements B. Software, lab functionality
Lecture	2	III	BASIC CONCEPTS A. History of wireframe and surface modeling B. Benefits and drawbacks in surface models C. Geometric construction methodology
Lab	2	IV	BASIC CONCEPTS A. History of wireframe and surface modeling B. Benefits and drawbacks in surface models C. Geometric construction methodology
Lecture	2	V	WIREFRAME MODELING A. Creating basic wireframe geometry B. Utilizing sketches and geometry from existing components C. Creating wireframe part
Lab	6	VI	WIREFRAME MODELING A. Creating basic wireframe geometry B. Utilizing sketches and geometry from existing components C. Creating wireframe part
Lecture	3	VII	ADVANCED WIREFRAME MODELING A. Creating advanced wireframe geometry B. Geometric versus Euclidean geometry C. Combining geometry for advanced shaping D. Creating advanced wireframe part
Lab	8	VIII	ADVANCED WIREFRAME MODELING A. Creating advanced wireframe geometry B. Geometric versus Euclidean geometry C. Combining geometry for advanced shaping D. Creating advanced wireframe part
Lecture	2	IX	SURFACE MODELING A. Creating basic surface geometry B. Constructing surface geometry from wireframe components C. Creating surface part
Lab	8	X	SURFACE MODELING A. Creating basic surface geometry B. Constructing surface geometry from

			wireframe components C. Creating surface part
Lecture	3	XI	ADVANCED SURFACE MODELING A. Creating basic surface geometry B. Merging hybrid surface geometry with existing solid components C. Creating advanced surface part
Lab	10	XII	ADVANCED SURFACE MODELING A. Creating basic surface geometry B. Merging hybrid surface geometry with existing solid components C. Creating advanced surface part
Lecture	2	XIII	OPERATIONS A. Creating operations between elements B. Creating operations modifying elements C. Creating advanced surface model utilizing: wireframe, surface, operations
Lab	8	XIV	OPERATIONS A. Creating operations between elements B. Creating operations modifying elements C. Creating advanced surface model utilizing: wireframe, surface, operations
Lecture	2	XV	ANALYSIS A. Logical B. Geometric C. Curve D. Surface properties
Lab	6	XVI	ANALYSIS A. Logical B. Geometric C. Curve D. Surface properties
Lecture	1	XVII	RENDERING A. Defining light sources and surface properties B. Texture mapping C. Creating and managing picture files
Lab	4	XVIII	RENDERING A. Defining light sources and surface properties B. Texture mapping C. Creating and managing picture files
Total Lecture Hours		18	
Total Laboratory Hours		54	
Total Hours		72	

IV. PRIMARY METHOD OF EVALUATION AND SAMPLE ASSIGNMENTS

A. PRIMARY METHOD OF EVALUATION:

Skills demonstrations

B. TYPICAL ASSIGNMENT USING PRIMARY METHOD OF EVALUATION:

Given a diagram or engineering drawing, use CATIA software to create a simple aircraft skin as a 3D surface model and utilize the skin to alter structural components. Save surface model on your removable media and submit to the instructor.

C. COLLEGE-LEVEL CRITICAL THINKING ASSIGNMENTS:

1. Using CATIA software, create, analyze and complete a complex surface and utilize it in a hybrid model. Save hybrid model to your removable media and submit to the instructor.
2. Using CATIA software, model a parametric surface and determine how to blend the shape with surrounding components. Save parametric surface on your removable media and submit to the instructor.

D. OTHER TYPICAL ASSESSMENT AND EVALUATION METHODS:

Performance exams
Class Performance

V. INSTRUCTIONAL METHODS

Demonstration
Laboratory
Lecture

Note: In compliance with Board Policies 1600 and 3410, Title 5 California Code of Regulations, the Rehabilitation Act of 1973, and Sections 504 and 508 of the Americans with Disabilities Act, instruction delivery shall provide access, full inclusion, and effective communication for students with disabilities.

VI. WORK OUTSIDE OF CLASS

Skill practice
Problem solving activities
Written work

Estimated Independent Study Hours per Week: 2

VII. TEXTS AND MATERIALS

A. UP-TO-DATE REPRESENTATIVE TEXTBOOKS

Richard Cozzens. CATIA V5 WORKBOOK RELEASE V5-6R 2013. Schoff Development Corporation, 2013.
Qualifier Text: INDUSTRY STANDARD

B. ALTERNATIVE TEXTBOOKS

C. REQUIRED SUPPLEMENTARY READINGS

D. OTHER REQUIRED MATERIALS

VIII. CONDITIONS OF ENROLLMENT

A. Requisites (Course and Non-Course Prerequisites and Corequisites)

Requisites	Category and Justification
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B. Requisite Skills

Requisite Skills

C. Recommended Preparations (Course and Non-Course)

Recommended Preparation	Category and Justification
Course Recommended Preparation Computer Aided Design/Drafting-31	

D. Recommended Skills

Recommended Skills
Familiarity with the basic CATIA interface and menu structure. CADD 31 -Utilize each of the CATIA menu functions as appropriate to the creation of 3-D solid models based on sketches.
Manage visibility of CATIA elements. CADD 31 - Manage the visibility of elements within a CATIA model using visible and invisible space.
Ability to create and manipulate 3D solid geometry with CATIA software. CADD 31 - Utilize CATIA software to create and manipulate 3-D CAD models of geometrically simple objects.
Ability to manage element and assembly constraints with CATIA software. CADD 31 - Employ the constraint tools to define and control sketched geometry.
Ability to execute Boolean operations. CADD 31 - Plan and execute the interactions of part bodies through the use of Boolean operations.

E. Enrollment Limitations

Enrollment Limitations and Category	Enrollment Limitations Impact
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Course created by Richard Hughes on 09/01/1998.

BOARD APPROVAL DATE: 03/15/1999

LAST BOARD APPROVAL DATE: 11/19/2018

Last Reviewed and/or Revised by: DOUG GLENN

Date: 09/25/2018

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