

CE 144: GEOMETRIC DESIGN OF HIGHWAYS

In Workflow

1. CE Committee Chair (richard.armstrong@csus.edu)
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Approval Path

1. Tue, 07 Jun 2022 23:31:36 GMT
Richard Armstrong (richard.armstrong): Approved for CE Committee Chair
2. Thu, 09 Jun 2022 14:54:41 GMT
Ghazan Khan (khan): Approved for CE Chair
3. Fri, 26 Aug 2022 17:07:03 GMT
Masoud Ghodrat Abadi (abadi): Approved for ECS College Committee Chair
4. Fri, 26 Aug 2022 17:31:32 GMT
Behnam Arad (arad): Approved for ECS Dean

New Course Proposal

Date Submitted: Thu, 12 May 2022 06:45:26 GMT

Viewing: CE 144 : Geometric Design of Highways

Last edit: Fri, 26 Aug 2022 17:03:10 GMT

Changes proposed by: Ghazan Khan (216292896)

Contact(s):

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Catalog Title:

Geometric Design of Highways

Class Schedule Title:

Geometric Design of Highways

Academic Group: (College)

ECS - Engineering & Computer Science

Academic Organization: (Department)

Civil Engineering

Will this course be offered through the College of Continuing Education (CCE)?

No

Catalog Year Effective:

Spring 2023 (2022/2023 Catalog)

Subject Area: (prefix)

CE - Civil Engineering

Catalog Number: (course number)

144

Course ID: (For administrative use only.)

203575

Units:

3

Is the primary purpose of this change to update the term typically offered or the enforcement of prerequisites at registration?

No

In what term(s) will this course typically be offered?

Fall, Spring

Does this course require a room for its final exam?

Yes, final exam requires a room

This course complies with the credit hour policy:

Yes

Justification for course proposal:

This proposal is to convert the experimental CE 196I (Geometric Design of Highways) course as a regular design elective in the undergraduate civil engineering curriculum. Prior to CE 196I, the civil engineering undergraduate curriculum had no course specifically focusing on a deeper understanding of geometric design concepts and practices. Geometric design is one of the fundamental sub-disciplines within the broader field of Transportation Engineering. The course was taught twice in fall 2021 and spring 2022 semesters with an enrollment of 26 and 32 students, respectively. The department chair has received several notes from industry professionals and alumni showing appreciation at the addition of this course into the civil engineering undergraduate curriculum.

This course is designed to introduce students to the latest industry standards, methods, and practices used for designing transportation facilities with specific emphasis on roads. The course will also familiarize students with the project development process and necessary considerations pertaining to geometric design of roadways. Concepts related to drainage design, quantity takeoff, cost estimating are also covered. Students will learn the application of computer programs and resource data used in a typical geometric design process and develop the necessary skills including communicating with the project team, developing and organizing project deliverables and products, and design control based decision making. Employers value civil engineers who have hands-on experience with software applications in conjunction with theoretical knowledge.

Course Description: (Not to exceed 80 words and language should conform to catalog copy.)

Theory and practice of the principles of geometric design of highways and roads focusing on designing visual aspects of highways, highway classification, design controls and criteria, design elements, safety, vertical and horizontal alignment, cross section, intersections, and interchanges. Emphasis on the latest Federal and California design standards and tools, methods, and practices.

Are one or more field trips required with this course?

No

Fee Course?

No

Is this course designated as Service Learning?

No

Is this course designated as Curricular Community Engaged Learning?

No

Does this course require safety training?

No

Does this course require personal protective equipment (PPE)?

No

Does this course have prerequisites?

Yes

Prerequisite:

CE140, CE 140L

Prerequisites Enforced at Registration?

Yes

Does this course have corequisites?

No

Graded:

Letter

Approval required for enrollment?

No Approval Required

Course Component(s) and Classification(s):

Lecture

Lecture Classification

CS#02 - Lecture/Discussion (K-factor=1WTU per unit)

Lecture Units

3

Is this a paired course?

No

Is this course crosslisted?

No

Can this course be repeated for credit?

No

Can the course be taken for credit more than once during the same term?

No

Description of the Expected Learning Outcomes and Assessment Strategies:

List the Expected Learning Outcomes and their accompanying Assessment Strategies (e.g., portfolios, examinations, performances, pre-and post-tests, conferences with students, student papers). Click the plus sign to add a new row.

	Expected Learning Outcome	Assessment Strategies
1	Explain geometric design of transportation facilities and its relation to other areas within the transportation engineering area.	-Class Participation, -Assignments, -Final Project, -Exams
2	Describe highway design objectives, constraints, and controlling factors.	-Class Participation, -Assignments, -Final Project, -Exams
3	Identify the basic parameters and constraints for the design of rural and urban alignment, cross section and intersections.	-Class Participation, -Assignments, -Final Project, -Exams
4	Apply geometric design concepts and design components including but not limited to horizontal and vertical alignments, sight distance, superelevation, geometric cross section, and roadside design.	-Class Participation, -Assignments, -Final Project, -Exams
5	Evaluate various design standards and methods and select the most appropriate ones.	-Class Participation, -Assignments, -Final Project, -Exams
6	Describe the project delivery process and project development team functions and responsibilities.	Final Project
7	Communicate with project teams, develop and organize project deliverables and products, and make decisions based on best judgment.	Final Project

8	Prepare technical report and presentation material summarizing the project description, details, and associated considerations.	Final Project
9	Perform quantity take-off calculations and prepare cost estimate.	-Reading Assignments, -Mid-Term Exam

Attach a list of the required/recommended course readings and activities:

CE 144 - Geometric Design of Highways - Syllabus - v2.docx

For whom is this course being developed?

Majors in the Dept

Is this course required in a degree program (major, minor, graduate degree, certificate?)

No

Does the proposed change or addition cause a significant increase in the use of College or University resources (lab room, computer)?

No

Will there be any departments affected by this proposed course?

No

I/we as the author(s) of this course proposal agree to provide a new or updated accessibility checklist to the Dean's office prior to the semester when this course is taught utilizing the changes proposed here.

I/we agree

University Learning Goals

Undergraduate Learning Goals:

- Competence in the disciplines
- Knowledge of human cultures and the physical and natural world
- Personal and social responsibility
- Intellectual and practical skills

Is this course required as part of a teaching credential program, a single subject, or multiple subject waiver program (e.g., Liberal Studies, Biology) or other school personnel preparation program (e.g., School of Nursing)?

No

GE Course and GE Goal(s)

Is this a General Education (GE) course or is it being considered for GE?

No

Reviewer Comments:

302822325 (Wed, 15 Jun 2022 20:34:50 GMT): Edited to integrate new ELO and Assessment Strategies fields.

Key: 14748