

Abilene Approval Chart for Curriculum Changes

A = Approve I = Information Item R = Respond In Writing

Course Number: CIVE 321 **or Degree Plan(s):**

	Campus-Level Academic Review¹	Chair	Faculty	Department	College	University
	Change to a Course Include signatures from all chairs/program directors for cross-listed courses. ¹					
1.	Title (description unchanged)	A	A	A	I	I
2.	Description (not affecting content)	A	A	A	I	I
3.	Course term(s)	A	I	A	I	I
4.	Content (change of course outcomes)	A	A	A	I	I
5.	Number of credit hours	A	A	A	A	A
6.	Course number within the hundred	A	A	I	I	I
7.	Course number beyond the hundred	A	A	A	A	A
8.	Prerequisites	A	A	A	I	I
9.	Course restriction (e.g., majors only, junior standing)	A	A	A	A	A
10.	Level change (U to G or G to U)	A	A	A	A	A
11.	Cross list course	A	A	A	A	A
12.	Department of record	A	A	A	A	A
13.	Open or close a course	A	A	A	A	A
	Change to a Degree Plan					
14.	Educational Program — Revise	A	A	A	A	A
15.	Educational Program — Adopt/revise admission requirements	A	A	A	A	A
16.	GPA — Revise program-required GPA	A	A	A	A	A
17.	Minor — Revise	A	A	A	A	A

		St	Ac	Ac	E	/	V	F	O	SI
	Full Review									
	Change to Catalog Information (for Campus)									
18.	General requirements for Bachelor's and Associate Degrees	-	-	-	-	A	A	A	A	I
19.	Policies governing academic probation and suspension	-	-	-	-	A	A	A	A	I
20.	Requirements for graduating with honors	-	-	-	-	A	A	A	A	I
	Change to a Degree Plan									
21.	Educational Program — Add or Discontinue ^{2 3}	A	A	A	A	A	A	A	A	I
22.	Educational Program — Discontinue (Provost-proposed)	R	-	R	A	A	A	A	A	I
23.	Minor — Add or Discontinue	A	A	A	A	A	A	-	A	I
24.	Minor — Discontinue (Provost-proposed)	R	-	R	A	A	A	-	A	I
25.	Degree — Add or Discontinue	A	A	A	A	A	A	A	A	I
26.	Degree — Discontinue (Provost-proposed)	R	-	R	A	A	A	A	A	I

	Change to General Education Requirements for Undergraduates (System)	\	II	III	IV	V	VI	VII	VIII	IX
27.	Change course outcomes of an included course	A	A	A	A	A	A	-	A	I
28.	Add or drop a required course from the General Education Requirements	A	-	A	-	A	A	A	A	I
29.	Add or drop a course from a menu within the General Education Requirements	A	-	A	-	A	A	-	A	I
30.	Comprehensive revision of General Education Requirements	-	-	-	-	A	A	A	A	I

Notes

² Any change to a cross-listed course requires the signature of both department chairs or program directors overseeing the course to ensure that the courses stay in sync. This includes courses taught at other campuses (e.g. BIBL 101 and BIBO 101).

³ For undergraduate majors, a minimum of 30 hours is required. These programs must have a minimum of 6 elective hours, unless the requirements of external accrediting bodies make it impossible. Master's programs must include a minimum of 30 hours, and doctoral programs must include a minimum of 30 hours beyond the master's.

⁴ When a department/school or dean proposes closing a program, approval routing follows the typical process beginning with the department/school. An administrative proposal by the provost or senior vice president for academic affairs would follow the "provost-proposed" routing on the chart.

 Department/School(s) 3/3/25
Chair Signature Date

Chair/Program Director Signature Date

 College Academic Council(s) 3/7/2025
Chair Signature Date

Chair Signature Date
 Dean(s) 3/7/2025
Signature Date

Signature Date

Teacher Education Council

Signature Date

Campus Academic Council:
Abilene Undergraduate or Abilene Graduate

Signature Date

Provost

Signature Date

University General Education Council

Signature Date

University Faculty

Abilene Faculty Senate Chair signature

Date

Dallas Faculty Council Chair signature

Date

Senior Vice President for Academic Affairs

Signature

Date

President

Signature

Date

Abilene New Course Application

You may delete the preceding instructional pages before submitting application.

Course ID (<i>Subject Code and Number</i>)	CIVE 321
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1. Systems and Catalog Information Complete each item.

A	Course Developer	Matthew Vechione
B	Course Instructor	Matthew Vechione
C	Course Title	Transportation Engineering
D	Course Abbreviation for Banner if title is more than 30 characters	-
E	College	OSE - Onstead Science and Engineering
F	Department or School	PHYS - Engineering & Physics
G	Number of Credit Hours	3
G1	Number of Lecture Contact Hours	3
G2	Number of Lab Contact Hours	0
H	Is the course for a fixed or variable number of credit hours?	Fixed If variable, explain rationale:
I	Is the course repeatable for additional credit?	No
J	Maximum total number of credit hours a student can earn for this course	3
K	Course Schedule Type	Lecture (LEC) See Schedule Type definitions in the Reference section.

L	Number of Faculty Workload Hours	3
M	Grading Mode	Standard
N	Maximum Enrollment	18
O	Catalog Description (50 words or less)	Introduction to analysis and design of fundamental transportation system components, such as highways and traffic systems, individual vehicle motion, basic elements of geometric design, pavement design, vehicle flow and elementary traffic flow relations, capacity analysis, and traffic forecasting.
P	List any prerequisites (course/s, test scores, class standing, major, etc.)	ENGR 272
Q	List any corequisites (these <i>must</i> be taken at the same time; note that a single requirement cannot be both a prerequisite <i>and</i> a corequisite)	
R	If the course is cross-listed, specify the subject code and course number of the other course	
S	Does this course require any additional student course fees?	No If yes, attach a completed course fee form .
T1	Will the course be offered in fall terms?	No
T2	Will the course be offered in spring terms?	Yes, every year
T3	Will the course be offered in summer terms?	No

U	First semester this course will be offered under new Course ID. <i>May not be earlier than the coming fall semester.</i>	Spring 2026
V	Is this course required for a program(s)?	Yes If yes, submit a separate completed curriculum proposal to change the program(s).
W	Should the addition of this course be retroactively applied to the degree plan it supports? <i>This is rare, and rationale should explain compelling extenuating circumstances.</i>	No If yes, provide rationale:
X	Has this course been offered as a Special Topics course? <i>New courses are not required to be taught as Special Topics courses prior to approval.</i>	No If yes, provide course ID, term, and enrollment:
Y	List any courses in which the content overlaps the proposed course. (Course ID and Name). <i>Attach a statement from the instructor/dept chair of the existing course justifying the new offering.</i>	

2. Curriculum

- A. Explain any effects of this course on any degree plans. If the addition of the course alters program requirements, submit a separate [Approval Chart for Curriculum Change](#) to update the program.

This is required in the new Civil Engineering degree program.

- B. Justify the addition of this course to the current curriculum, explaining the gap it meets.

No other course in the curriculum covers the materials used in this transportation engineering course. In addition, the Fundamentals of Engineering (FE) Exam is the first step for engineering students towards licensure. Currently, on the FE Exam for civil engineering, there are 9-14 questions related to transportation engineering. This course will be aimed at covering as many of those topics as possible.

3. Course Design

A. Audience and Course Goal

1. Describe the intended audience, including prerequisite skills.
This course is intended for Civil Engineering majors during their junior year as an introductory course to Transportation Engineering.
2. State the overarching course goal(s) in performance terms.

Students who have taken this course will have a fundamental background on transportation engineering concepts including geometric design of highways, capacity analysis, vehicle stream models, as well as flexible and rigid pavement design.

B. Student Learning Outcomes and Measurements

	Student Learning Outcome	Measurement
1	Develop an organized approach to solving transportation system analysis and design problems.	Homework, weekly quizzes, exam, project
2	Explain the transportation system facilities, flow, and control system from the supply and demand perspective, different transportation modes and their pros and cons, and current issues and technologies used in the transportation industry.	Homework, weekly quizzes, exam, project
3	Explain the motions, braking distance, the human factors, horizontal/vertical alignment, superelevation design, stopping/passing sight distance, channelization, roundabouts, and traffic calming devices in road design.	Homework, weekly quizzes, exam, project
4	Analyze vehicle stream models, relationship among flow/speed/concentration, and time-distance diagrams of flow, the capacity and level of service for both highways and freeways, signal detectors and controllers, signal timing, pretimed and actuated signal coordination.	Homework, weekly quizzes, exam, project
5	Design flexible and/or rigid pavements based on existing or projected traffic conditions, soil conditions and expected service life.	Homework, weekly quizzes, exam, project

6	Use commercially available software as a tool to perform traffic simulation and pavement design.	Homework, weekly quizzes, exam, project
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C. Text and Resources

Give the full publication information of the textbook/s and other required resources and outside readings. For **combined undergraduate/graduate** courses, make two lists:

- A. full publication information; label **Undergraduate**.
- B. full publication information; label **Graduate**.

Principles of Highway Engineering and Traffic Analysis, 7th Edition, Mannering, F. and Washburn, S. (2019), John Wiley & Sons, Inc. ISBN 978-1119493969.

4. Supporting Documentation

Required of all applications	
1	Approval Chart for Curriculum Changes
2	Syllabus — Attach the syllabus for the course based upon the anticipated first-semester offering.
4	Library — Submit new course application and syllabus to the Library dean's office. Attach the Library's memo.
Attach if applicable	
5	Content Overlap — Include one document for each course you listed in Section 1Y. Attach statement from instructor/dept chair of existing course justifying the new offering.
6	Departmental Resources — List the resources that support the course and are available only through the department, if applicable. Attach the list of the holdings and the location(s).
7	Resources — List resources (other than library or departmental resources) that are needed to support this course (computers, lab equipment, other technology, etc.). Attach a complete list of all items and indicate possible sources or estimated cost of each. List the sources of any needed funds.

8	Expenses — List additional expenses needed to implement this course (full-time or part-time faculty, graduate or lab assistants, student employees, travel, special student costs, room renovation, storage facility, etc.). Attach a complete list of all items, the estimated cost of each and the source of the funds.
9	Justification — Attach any documents to which you refer in Section 2B.

Transportation Engineering (CIVE 321)

Spring 2025 - TR 1:30-2:50 - BEN 119 - 3 Credit Hours

Instructor: Dr. Matthew Vechione

Email: mmv24b@acu.edu

Office: OSC 121A

Phone: (325) XXX-XXXX

Office Hours: M 9:00-11:00 AM, W 9:00-11:00 AM, W 1:00-4:00 PM (or by appointment)

Text: Principles of Highway Engineering and Traffic Analysis, 7th Edition, Mannering, F. and Washburn, S. (2019), John Wiley & Sons, Inc. ISBN 978-1119493969.

Course Catalog Description: Introduction to analysis and design of fundamental transportation system components, such as highways and traffic systems, individual vehicle motion, basic elements of geometric design, pavement design, vehicle flow and elementary traffic flow relations, capacity analysis, and traffic forecasting.

Prerequisites: ENGR 272

Course Learning Outcomes

	Student Learning Outcome	Measurement
1	Develop an organized approach to solving transportation system analysis and design problems.	Homework, weekly quizzes, exam, project
2	Explain the transportation system facilities, flow, and control system from the supply and demand perspective, different transportation modes and their pros and cons, and current issues and technologies used in the transportation industry.	Homework, weekly quizzes, exam, project

3	Explain the motions, braking distance, the human factors, horizontal/vertical alignment, superelevation design, stopping/passing sight distance, channelization, roundabouts, and traffic calming devices in road design.	Homework, weekly quizzes, exam, project
4	Analyze vehicle stream models, relationship among flow/speed/concentration, and time-distance diagrams of flow, the capacity and level of service for both highways and freeways, signal detectors and controllers, signal timing, pretimed and actuated signal coordination.	Homework, weekly quizzes, exam, project
5	Design flexible and/or rigid pavements based on existing or projected traffic conditions, soil conditions and expected service life.	Homework, weekly quizzes, exam, project
6	Use commercially available software as a tool to perform traffic simulation and pavement design.	Homework, weekly quizzes, exam, project

Grading:

Professional Practice	5%
Homework	15%
Exam 1	20%
Exam 2	20%
Project	15%
Final Exam	25%

Grade scale:

89.5% and above:	A
79.5% to 89.4%:	B
69.5% to 79.4%:	C
59.5% to 69.4%:	D
Below 59.5%:	F

Homework: Homework will be graded purely on a completion basis. If you have put forth a good faith effort (actual work is shown, even if the answer is wrong or the approach is slightly off), you will get full credit.

Exams: There will be two Exams for the course and one comprehensive Final Exam.
Exam 1 – Horizontal and Vertical Alignment

Exam 2 – Level of Service, Traffic Stream Measurements, Highways: Interrupted Flow
Final Exam - select material from the two previous exams.

Final Exam Date: Tuesday, May 6, 2025 at 12:00 PM – 1:45 PM

Grading Policy: My goal in grading is to assess how well you know the material. I will assign full points only if **both** the final answer and work are correct. If either one is incorrect, the entire problem will be counted wrong.

Corrections: Since the overall goal of the course is learning and not testing, corrections will be allowed on exams. However, to be eligible for test corrections, you must have completed and submitted the homework and homework quizzes for the chapters covered on the exam **before** the day of the exam.

Project: The project in the course will include a preliminary design for a new highway segment or redesign of an existing one in the form of a technical report with drawings. More specific tasks include:

- Selecting a site and gathering necessary data (e.g., traffic demand, topography)
- Developing the alignment, lane configuration, and cross-sectional elements

Attendance: A large component of this class is performed during class time. If you miss class, you will need to work with your professor and/or team to reschedule a time to cover the material you missed in class or project work. Also, you may be withdrawn from the course if you miss more than 6 classes.

Schedule (tentative, check Canvas for most up-to-date schedule)

Week	Chapter	Topic	Due
1	1	Course Introduction and Transportation Finance	
2	2	Human Factors and Horizontal Alignment	HW 1
3	3	Vertical Alignment	HW 2
4		Exam 1	
5	5	Traffic Flow and Stream Measurements	HW 3
6	6	Highways Uninterrupted Flow and LOS	HW 4
7	7	LOS and Design Traffic Volumes	HW 5

8	7	LOS	HW 6
9		Exam 2	
10	4	Flexible Pavement Design	HW 7
11	4	Flexible Pavement Design	HW 8
12	4	Rigid Pavement Design	HW 9
13	4	Rigid Pavement Design	HW 10
14		Intro to Synchro	
15		Intro to PaveXpress	
Finals		Final Exam	

Classroom Policies:

Students are expected to be in class on time and participate by taking notes, asking questions, and working through problems during class time. A subset of those problems will be worked out in small groups on whiteboards in the class. No specific grade is tied to attendance; however, quizzes and exams which are missed due to unexcused absences will require tokens to retake. Homework is due in class, and late work is not accepted.

Learning Objectives Addressed in this Course:

Students should develop an ability to apply formulas and techniques to problems in Horizontal and Vertical Alignment, level of service, traffic stream measurements, and interrupted flow highways. This is assessed through homework, exams, and the course project (See ABET SO 1).

Title IX Policy:

At ACU, we strive to comply with all applicable legal requirements prohibiting, preventing, and responding to sexual misconduct against any member of the ACU community. The full Title IX policy and process can be found at <https://acu.edu/human-resources/title-ix-and-sexual-misconduct-information/>.

Academic Integrity Policy:

Academic integrity is demonstrated by behavior that honors the learning environment, regardless of setting, context, location or modality. ACU's Academic Integrity Policy can be found at <https://acu.edu/office-of-the-provost/academic-policies/>.

Students or groups of students are expected to submit work that is their own.

Academic integrity is defined as academic work completed as assigned for each class by the individual or group responsible for the work. Violations of academic integrity and other forms of cheating involve the intention to deceive, mislead, or misrepresent and therefore, are a form of lying. Such actions are contrary to behavioral norms that flow from the nature of God.

Academic misconduct includes, but is not limited to, the following: 1) Failing to give credit to sources used in a work in an attempt to present the work as one's own, 2) Submitting papers or projects obtained from another source (e.g., research service or club paper file) as one's own, 3) Falsifying information orally or in writing, and 4) Receiving, giving, or using unauthorized aid on an examination or quiz. Academic misconduct may result in, but is not limited to, a zero on the assignment and/or an F in the course. Additionally, the department chair, Dean of the College of Arts and Sciences, and the Dean of Student Life will be notified. See the full university policy, including how to appeal a decision, by following this link:

<http://www.acu.edu/academics/provost/policies/index.html>.

Using Chegg or Other Online Homework Help Services

While there are many websites claiming to offer study aids to students, those websites could cause students to find themselves in violation of academic conduct guidelines. These websites include (but are not limited to) Chegg, Coursicle, Quizlet, and Course Hero.

ACU Engineering and Physics does not endorse the use of these products **in an unethical manner**, which could lead to a violation of the [ACU Academic Integrity Policy](#). Sites such as these encourage students to upload course materials, such as test questions, individual assignments, and examples of graded material. These materials are the intellectual property of instructors, the university, or publishers and may not be distributed without prior authorization. Students who engage in such activity could be found in violation of academic conduct standards and could face course and/or University penalties, **as well as copyright infringement prosecution**.

If you have any questions about whether you are using a service ethically, bring your questions to me, and I will be happy to talk.

University ADA Compliance Statement

Abilene Christian University is dedicated to removing barriers and opening access for students with disabilities in compliance with ADA and Section 504 of the Rehabilitation Act. The Alpha Scholars Program facilitates disability accommodations in cooperation with instructors. In order to receive accommodations, you must be registered with Alpha Scholars Program, and you must complete a specific request for each class in which you need accommodations. If you have a documented disability and wish to discuss academic accommodations, please call our office directly at 325-674-2667.

The mission of ACU: to educate students for Christian service and leadership throughout the world.

The mission of the Onstead College of Science and Engineering: To be announced.

The mission of the Engineering and Physics Department:

The ACU engineering program strongly supports the university's mission of educating students for Christian service and leadership throughout the world. In support of this mission, ACU engineering graduates will attain:

- A deep and broad understanding of engineering principles and practices as evidenced by professional employment, continued professional development and graduate study in engineering or other professional fields.
- An extensive knowledge of the innovative design processes unique to engineering professionals, as demonstrated by using critical thinking skills in contribution to scientific and technical literature, patents and intellectual property, professional societies, and creative designs.
- A thorough understanding of Christian service and leadership as shown in commitments to professionalism, ethics, and service and leadership within the engineering profession, church and society.

Christian Perspective

As a Christian engineer, I believe you can best glorify God by excelling in your chosen profession, and doing so morally and ethically. The foundation of this excellence is technical proficiency, without which moral and ethical concerns cannot be addressed. This course is intended to provide you with technical skills required for a moral and ethical engineer.

Updated 8/19/2024

ABILENE CHRISTIAN UNIVERSITY

LIBRARY

M E M O R A N D U M

DATE: March 3, 2025
TO: Dr. Matthew Vechione
FROM: Mark McCallon, Associate Dean for Library Information Services
RE: Course Application for CIVE 321 – Transportation Engineering

After reviewing the course application and syllabus, the library will work to support the proposed course. Please contact Mark McCallon, Librarian Liaison, if additional resources are needed for the course. Thank you for letting us review the course proposal and syllabus.



February 24, 2025

Dr. Matthew Vechione, Assistant Professor of Engineering and Physics
Department of Engineering and Physics
Onstead College of Science
OSC 121A
(325) 674-xxxx
mmv24b@acu.edu

Re: Transportation Engineering (CIVE 321)

Dear Dr. Vechione,

Thank you for submitting Transportation Engineering (CIVE 321) to us for review. I have reviewed it based on the ACU Syllabus Guidelines. I found the syllabus to meet all aspects of the checklist.

Please note that this letter is intended as a reference, which will be read by the department chair and council members, who may also have questions or comments of their own. If you have any questions, please feel free to let me know.

Please also let me know if we can help in the design and facilitation of this course.

Sincerely,

A handwritten signature in black ink, appearing to be 'S. Hamm', followed by a long horizontal line.

Dr. Scott E. Hamm,
Assistant Director, Adams Center