

Winter 2004

Course Number	CE 410/510
Title	Geometric Design of Transportation Facilities
Section	001
CRN(s)	
Credits	4
Design Credits	3
Prerequisite(s)	CE 351
Days/Time	
Location	
Final Exam Day/Time	

Course Website

Instructor	B. Kent Lall
Office	434 SB2
Phone	503 725 4245
E-mail	kent@cecs.pdx.edu
Office Hours	
Mailbox Location	CEE Office, Science Building 2, Room 128

Required Text or Other Materials:

Class Notes

Recommended References/Optional Text/Supplemental Readings & Resources:

A Policy of Geometric Design of Roads and Streets, AASHTO

Catalog Course Description:

Alignment considerations, simple curves, compound and reverse curves, parabolic curves, spiral curves, earthworks, curve problems in highway and railroad design, horizontal and vertical alignment, stopping and passing sight distances, widening on curves, superelevation runoff, highway design and safety, accommodating public transport, design consistency, and contextual design.

Design/Professional:

50% design

Course Objectives – Students must demonstrate the ability to:

1. apply engineering fundamentals to alignment design
2. apply mathematics and engineering principles to alignment computations
3. compute and develop data for field setting of curves to meet specific requirements
4. apply safety guidelines to geometric design in developing solutions
5. understand context-sensitive design and variations in practice

Course Requirements:

Course Grading

Assignment	Points Assigned or % of Total Grade
Homework	20%
Midterm I	20%
Midterm II	20%

Final Examination

40%

Incompletes: A grade of "I" is granted by the instructor *only* with prior approval and consent. Criteria are outlined in the PSU Bulletin. **Program requirements:** {for UG courses} The CEE Department requires that junior and senior engineering courses must be completed with a minimum grade of C-, and a student's cumulative PSU GPA must be 2.25 or higher to graduate from the BSCE program.

Course Schedule

Wk No	Date	Topic	Reading Assignment	Homework Assignment	HW Due Date
1		Introduction, topographic surveys & photogrammetry, alignment design			
2		Horizontal curve characteristics, deflection angles, curve setting		5 problems	
3		Compound curves, staking, computation unknown parts		4 problems	
4		Reverse curves, applications		3 problems	
5		Vertical curves, setting & elevations, midterm I		3 problems	
6		Unequal-tangent vertical curves, special cases & computations		3 problems	
7		Spiral curves, length and staking		3 problems	
8		Superelevation, AASHTO guidelines, safety, midterm II		4 problems	
9		Context-sensitive design		report	
10		Applications in public transport, European geometric design practice		report	
		FINAL EXAM			

Computer and E-mail Accounts

All engineering students should activate their engineering computer account (go to the CadLab in SB2, 169) which will allow them to use engineering computer labs and e-mail. You should activate it *before* the day you need it. If you encounter problems with this account, see the lab attendant, or e-mail: support@cecs.pdx.edu. Please note: the CEE Department regularly sends course announcements, job information, etc. to students' CECS accounts, so if you do not check it regularly, we recommend forwarding your CECS e-mail to whatever e-mail address you use.

Ethics and Professionalism

As future professional engineers you should plan to take the FE Exam (see the Oregon State Board of Examiners for Engineering and Land Surveying at www.osbeels.org), and you should be familiar with the ASCE Code of Ethics (www.asce.org/inside/codeofethics.cfm), which includes the following:

Engineers shall act in such a manner as to uphold and enhance the honor, integrity and dignity of the engineering profession.

The PSU Student Conduct Code prohibits all forms of academic cheating, fraud, and dishonesty. Further details can be found in the PSU Bulletin. Allegations of academic dishonesty may be addressed by the instructor, and/or may be referred to the Office of Student Affairs for action. Acts of academic dishonesty may result in a failing grade on the exam or assignment for which the dishonesty occurred, disciplinary probation, suspension or dismissal from the University. The students and the instructor will work together to establish optimal conditions for honorable academic work. Questions about academic honesty may be directed to the Office of Student Affairs (<http://www.ess.pdx.edu/osa/>).

Student Groups and Professional Organizations

Participation in student and professional groups can be a valuable part of your education experience. Membership gives students opportunities to get to know fellow students better, meet and network with professionals, collaborate in solving real engineering problems, learn about internship or job possibilities, socialize and have fun. Your fellow students can be a great source of help and guidance in your academic endeavors. Consider becoming active with a student organization, such as the following:

- American Society of Civil Engineers Student Group (ASCE): <http://www.asce.pdx.edu>
- Institute of Transportation Engineers Student Chapter (ITE): <http://www.its.pdx.edu/ite/>

Most professional organizations have monthly meetings and encourage student participation by providing discounts for lunch and dinner meetings. These meetings provide opportunities to network with potential future employers, learn about scholarships, and increasing your technical knowledge. Take a look at these organizations as a starting point:

- American Society of Civil Engineers (ASCE) Oregon Section: www.asceor.org
- Institute of Transportation Engineers (ITE) Oregon Section: www.oregonite.org
- Society of Women Engineers (SWE) Columbia River Section - <http://www.swe-columbia-river.org>
- Structural Engineers Association of Oregon (SEAO): www.seao.org

Resources

As a PSU student, you have numerous resources at your disposal. Please take advantage of them while you are here. A small sample is listed below:

- CE Website (includes program info, job listings, etc.): <http://www.cee.pdx.edu/>
- Career Center: <http://www.career.pdx.edu/>
- Center for Student Health & Counseling: <http://www.shac.pdx.edu/>
- The Writing Center: <http://www.writingcenter.pdx.edu/>
- PSU Disability Resource Center: 435 Smith Memorial Union

Note: The PSU Disability Resource Center is available to help students with academic accommodations. If you are a student who has need for test-taking, note-taking or other assistance, please visit the DRC and notify the instructor at the beginning of the term.

Introduction to Library and Literature Research

With the advent of the Internet it is very tempting to think that all necessary resources for a term project will be available in full text after typing in a few words at Google.com. This is not the case. You will often need to go to the library, use real library search tools and

access real books and articles contained in refereed/archival journals.

Be sure to make use of the Vikat library catalog. Go to the PSU library home page at <http://www.lib.pdx.edu/>. Also available on the library home page are Full Text Electronic Journals: <http://www.lib.pdx.edu/~bvws/bytitle.html>, and a list of on-line Databases: <http://www.lib.pdx.edu/resources/databases/databases.html>. Try EI Compendex (<http://www.ei.org/ev2/ev2.home>) and Lexis-Nexis. Note that access to these databases is free for PSU students, but you must be using a computer on campus or via a dial-in service. See <http://www.lib.pdx.edu/services/distance/proxyserver.html> for instructions on how to gain off-campus access using a proxy server.

Campus Safety

The University considers student safety paramount. The Campus Public Safety Office is open 24 hours a day to assist with personal safety, crime prevention and security escort services. Call 503-725-4407 for more information. For Campus emergencies call 503-725-4404.