

## CEE 181A SENIOR DESIGN PRACTICUM

(Required for CE and EnE)

- Catalog Data:** **CEE 181A: Senior Design Practicum (Credit Units: 2) F.** Team designs a land development project including infrastructural, environmental, circulation aspects. Focus on traffic impact studies, design of road layouts, geometry, signals, geotechnical and hydrological analysis, design of structural elements, economic analysis. Oral/written interim and final design reports. Laboratory sessions. In-process grading. Corequisites: CEE121 and CEE151C. Prerequisites: CEE81B, CEE110, CEE161. CEE181A-B-C must be taken in the same academic year. (Design units: 1)
- Textbook:** Dewbury, S.O. *Land Development Handbook: Planning, Engineering, and Surveying*, 2<sup>nd</sup> Edition, McGraw-Hill, 2002.
- References:** Merritt, F.S., Loftin, M.K., and Ricketts, J.T. *Standard Handbook for Civil Engineering*, 5<sup>th</sup> Edition, McGraw-Hill.  
Handouts in lecture and collected reference material on legal, ethical, societal and contractual aspects of civil engineering projects, as appropriate.
- Coordinator:** Michael McNally and Brett Sanders
- Course Outcomes:** Students will:  
Design a transportation, structural, water or wastewater system, component or process to meet desired needs.  
Function as part of a civil and environmental engineering design team, including contributing to the integration of all design elements into a cohesive whole that is summarized in a professional-standard design report.  
Apply ethical, societal, legal and contractual details in a civil and environmental engineering project.  
Effectively communicate and present his/her design to a technical audience.
- Prerequisites By Topic:** Structural design – concrete and timber, Transportation design – signals and streets, Hydrologic analysis and design, Waste management designs, and Basics of cost calculations
- Lecture Topics:** Week 1. The Land Development Process  
Week 2. Planning & Permit Process  
Week 3. Site Planning Report  
Week 4. Environmental Impact Analysis  
Week 5. Construction Management  
Week 6. Real Property Law  
Week 7. Landscape & Utilities  
Week 8. Civil Engineering Ethics.  
Week 9. Scheduling & Production Control  
Week 10. Quality Assurance /Quality Control

- Class Schedule:** Meets for 1.5 hours of lecture and 1.5 hours of lab each week for 10 weeks.
- Computer Usage:** Use of AutoCAD, GIS, MS-schedule, EXCEL, PowerPoint, and other software for planning, design, and economic analysis.
- Laboratory Projects:** In weekly lab sessions, students meet with their consulting teams to develop an overall site development plan corresponding to a real world development project. Final site develop report and formal team presentation are required.
- Professional Component:** Contributes to the Civil Engineering Topics courses and Major design experience; and the Environmental Engineering Topics courses and Major design experience.
- Relationship to Program Outcomes:** CE - The course relates to Program Outcomes a, b, c, d, e, f, g, h, i, and k as stated at:  
<http://undergraduate.eng.uci.edu/degreeprograms/civil/mission>  
 EnE - The course relates to Program Outcomes a, b, c, d, e, f, g, h, i, and k as stated at:  
<http://undergraduate.eng.uci.edu/degreeprograms/environmental/mission>

**Design Content Description**

**Approach:** Comprehensive land development and design using a real-world development area in the local community, including all elements relating to the overall project design and to the integrated final design of structural, transportation, water, and environmental facilities, including CAD drawing, visualization, and redesign for the requisite components. Formal report and presentations.

**Lectures:** 0%

**Laboratory Portion:** 100%

**Grading Criteria:**

Site Plan Report:	15% (CEE 181A)
Preliminary Design Presentation:	15% (CEE 181B)
Final Project Report:	40% (CEE 181C)
Final Project Presentation:	10% (CEE 181C)
Attendance:	10% (All quarters)
Homework, Exams:	<u>10%</u> (All quarters)
	100%

**Estimated ABET Category Content:**

Mathematics and Basic Science: \_\_\_ credit units or \_\_\_ %  
 Engineering Science: 1 credit units or 50 %  
 Engineering Design: 1 credit units or 50 %

**Prepared by:** S. Ritchie/MGM **Date:** July 2007

**CEP Approved:** Fall 2004