MASTER SYLLABUS

COURSE NUMBER – COURSE NAME
CONS 432 - CIVIL DRAFTING AND DESIGN

Created by: Robert Blickwedehl

Updated by: Joseph Reilly

Canino School of Engineering Technology
Department: Civil and Construction Technologies
Semester/Year: Spring/2019
A. **TITLE:** CIVIL DRAFTING AND DESIGN

B. **COURSE NUMBER:** CONS432

C. **CREDIT HOURS:** (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity)

# Credit Hours: 3  
# Lecture Hours: 2 per week  
# Lab Hours: (1) three-hour lab per week  
Other: per week

Course Length: 15 Weeks

D. **WRITING INTENSIVE COURSE:** Yes ☐ No ☒

E. **GER CATEGORY:** None: ☒ Yes: GER
If course satisfies more than one: GER

F. **SEMESTER(S) OFFERED:** Fall ☐ Spring ☒ Fall & Spring ☐

G. **COURSE DESCRIPTION:**

This course covers the design of infrastructure for land development and the preparation of plans and specifications to construct it. Students design and prepare drawings for water supply, storm sewers, sanitary sewers, roads and site grading and drainage using CAD software.

H. **PRE-REQUISITES:** None ☐ Yes ☒ If yes, list below:

Pre-requisites: CONS 322 (Hydraulics), CONS 385 (Hydrology and Hydrogeology), CONS 216 (Soils in Construction), CONS 372 (Highways and Transportation)

**CO-REQUISITES:** None ☒ Yes ☐ If yes, list below:
### I. STUDENT LEARNING OUTCOMES: (see key below)

By the end of this course, the student will be able to:

<table>
<thead>
<tr>
<th>Course Student Learning Outcome [SLO]</th>
<th>Program Student Learning Outcome [PSLO]</th>
<th>GER [If Applicable]</th>
<th>ISLO &amp; SUBSETS</th>
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<tbody>
<tr>
<td>a. Design a small water distribution system for a small residential or commercial development</td>
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<td>5-Ind, Prof, Disc, Know Skills 2-Crit Think ISLO</td>
<td>Subsets PS Subsets Subsets</td>
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<td>b. Design a storm drainage system for a small residential or commercial development</td>
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<td>5-Ind, Prof, Disc, Know Skills 2-Crit Think ISLO</td>
<td>Subsets PS Subsets Subsets</td>
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<td>c. Design a street system for a small residential or commercial development</td>
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<td>5-Ind, Prof, Disc, Know Skills 2-Crit Think ISLO</td>
<td>Subsets PS Subsets Subsets</td>
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<td>d. Prepare a site grading plan</td>
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<td>5-Ind, Prof, Disc, Know Skills 2-Crit Think ISLO</td>
<td>Subsets PS Subsets Subsets</td>
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<td>e. Prepare an erosion and sediment control plan</td>
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<td>5-Ind, Prof, Disc, Know Skills 2-Crit Think ISLO</td>
<td>Subsets PS Subsets Subsets</td>
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<td>f. Design a sewer system for a residential development</td>
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<td>5-Ind, Prof, Disc, Know Skills 2-Crit Think ISLO</td>
<td>Subsets PS Subsets Subsets</td>
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<td>ISLO #</td>
<td>Institutional Student Learning Outcomes [ISLO 1 – 5]</td>
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<td>Communication Skills</td>
<td>Oral [O], Written [W]</td>
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<td>2</td>
<td>Critical Thinking</td>
<td>Critical Analysis [CA], Inquiry &amp; Analysis [IA], Problem Solving [PS]</td>
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<td>3</td>
<td>Foundational Skills</td>
<td>Information Management [IM], Quantitative Lit./Reasoning [QTR]</td>
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<td>Social Responsibility</td>
<td>Ethical Reasoning [ER], Global Learning [GL], Intercultural Knowledge [IK], Teamwork [T]</td>
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<td>5</td>
<td>Industry, Professional, Discipline Specific Knowledge and Skills</td>
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*Include program objectives if applicable. Please consult with Program Coordinator.*
J. **APPLIED LEARNING COMPONENT:**  
Yes ☒  No ☐

If YES, select one or more of the following categories:

- [ ] Classroom/Lab  
- [ ] Internship  
- [ ] Clinical Placement  
- [ ] Practicum  
- [ ] Service Learning  
- [ ] Community Service  
- [ ] Civic Engagement  
- [ ] Creative Works/Senior Project  
- [ ] Research  
- [ ] Entrepreneurship  
- [ ] (program, class, project)

K. **TEXTS:**


L. **REFERENCES:**

M. **EQUIPMENT:** None ☐  Needed: Technology enhanced classroom and computer laboratory

N. **GRADING METHOD:** A - F

O. **SUGGESTED MEASUREMENT CRITERIA/METHODS:**

- Exams  
- Homework  
- Design Projects

P. **DETAILED COURSE OUTLINE:**

I. Land development design overview  
A. Types of development  
B. Government and regulatory functions  
C. Project planning  
D. Obtaining approvals  
II. Site selection and analysis  
A. Feasibility studies  
B. Environmental considerations  
III. Project design  
A. Design criteria  
B. The design process  
C. Documents  
D. Site investigations  
IV. Street design  
A. Design considerations  
B. Cross sectional elements
C. Horizontal alignment
D. Vertical alignment
V. Wastewater design
   A. Planning studies
   B. Design criteria
   C. Sewer systems
   D. Pumping stations
   E. Wastewater treatment
VI. Water supply design
   A. Demand estimates
   B. Design criteria
   C. Piping systems
   D. Pump stations
   E. Groundwater supply systems
VII. Storm drainage design
   A. Review of hydrology
   B. Estimation of peak discharge
   C. Pavement drainage
   D. Swales and ditches
   E. Culvert design
   F. Storm sewers
   G. Detention basins
   H. Check dams
VIII. Erosion and sediment control
   A. Consequences of excessive erosion
   B. Factors influencing soil erosion
   C. Universal soil loss equation
   D. Sediment trapping facilities
   E. Sediment control planning
IX. Grading plans
   A. Design considerations
   B. Estimation of earthwork quantities
   C. Plan drafting

Q. LABORATORY OUTLINE: None ☐ Yes ☑

1. Subdivision layout (1 week)
2. Street plan (2 weeks)
3. Sewer design (2 weeks)
4. Water supply design (3 weeks)
5. Stormwater drainage design (4 weeks)
6. Erosion and sediment control plan (2 weeks)
7. Final design presentation (1 week)