COURSE OUTLINE
CONS 432 – CIVIL DRAFTING AND DESIGN

Prepared By: Robert R. Blickwedehl
Revised by Dr. Adrienne Rygel, Spring 2014
CONS 432 – CIVIL DRAFTING AND DESIGN

A. **TITLE:** Civil Drafting and Design

B. **COURSE NUMBER:** CONS 432

C. **CREDIT HOURS:** 3

D. **WRITING INTENSIVE COURSE:** no

E. **COURSE LENGTH:** 15 Weeks

F. **SEMESTER(S) OFFERED:** Spring

G. **HOURS OF LECTURE, LABORATORY, RECITATION, TUTORIAL, ACTIVITY:**
   2 lecture hours and 3 lab hours per week

H. **CATALOG 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.

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

J. **GOALS (STUDENT LEARNING OUTCOMES):**
   By the end of this course, the student will be able to:

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<thead>
<tr>
<th>Course Objective</th>
<th>Institutional SLO</th>
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<tbody>
<tr>
<td>a. Design a small water distribution system for a small residential or commercial development</td>
<td>2. Critical Thinking</td>
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<td>3. Professional Competence</td>
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<td>b. Design a storm drainage system for a small residential or commercial development</td>
<td>2. Critical Thinking</td>
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<td>3. Professional Competence</td>
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<td>c. Design a street system for a small residential or commercial development</td>
<td>2. Critical Thinking</td>
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<td>3. Professional Competence</td>
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<td>d. Prepare a site grading plan</td>
<td>1. Communication</td>
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<td>2. Critical Thinking</td>
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<td>3. Professional Competence</td>
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<td>e. Prepare an erosion and sediment control plan</td>
<td>1. Communication</td>
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<td>2. Critical Thinking</td>
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<td>3. Professional Competence</td>
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<tr>
<td>f. Design a sewer system for a residential development</td>
<td>2. Critical Thinking</td>
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<td>3. Professional Competence</td>
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K. **TEXTS:**

L. **REFERENCES:**

M. **EQUIPMENT:** Technology enhanced classroom and computer laboratory

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

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

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)