What is CIVL 1112?

- **Course Title:** Civil Engineering Analysis
- **Course Description:**
  Microcomputer applications for data analysis, presentation, documentation; emphasis on algorithm design and logic; fundamental numerical analysis; elementary programming

What is CIVL 1112?

- **Prerequisites:**
  CIVL 1101 – Civil Engineering Measurements
- **Course Meetings:**
  Tuesday/Thursday: 1:00 - 1:55pm, ET 233
  Lab: Tuesday: 2:30 - 5:20 pm, ES 114
  Wednesday: 2:30 - 5:20 pm, ES 114
  Thursday: 2:30 - 5:20 pm, ES 114

What is CIVL 1112?

- **Instructor:**
  Dr. Charles Camp, Office: ES 106B
  Phone: 678-3169 (office)
  Email: cvcamp@memphis.edu
- **Office hours:** An "open door policy" or by appointment

What is CIVL 1112?

- **Recommended Textbooks**
  - *Strategies for Creative Problem Solving*
    by Fogler and LeBlanc - Prentice Hall
  - *Any reference for Microsoft Excel*
  - *Excel 2016 All-In-One Desk For Dummies*
    by Greg Harvey

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- **Recommended Textbooks**
  - *Design and Control of Concrete Mixtures*
    Portland Cement Association 2016

What is CIVL 1112?

- **Top Hat (just like from the CIVL 1101)**
  Top Hat Join Code: 770946
What is CIVL 1112?

Course Objectives

1. To continue to build on the skills and materials introduced in CIVL 1101 in order to further enhance the ability of the student to execute the design process typical to the Civil Engineering profession.

2. To expand the communication skills of the student through a series of project reports and presentations completed within a group environment.

3. To further develop the student’s skills in the application of the personal computers to solution of engineering problems and to the development of material supporting engineering decision making and report presentation.

4. To develop the analysis skills of the student, especially in the evaluation of alternative designs.

5. To expand the computational skills of the student through the use of computer software as a support to the analysis process.

6. To expose the student to problems typical and illustrative of those found in civil engineering design.

7. To develop an understanding of the limitations, constraints, and applicability of various analytical methods.

Course Learning Outcomes

<table>
<thead>
<tr>
<th>Course Learning Outcomes</th>
<th>POs*</th>
<th>Assessment Tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Recognize and apply basic modeling principles to the analysis, design, and evaluation of civil engineering problems</td>
<td>a, k</td>
<td>Homework, exams, and projects</td>
</tr>
<tr>
<td>2. Recognize limitations, constraints, and applicability of various modeling and analytical methods</td>
<td>a, e</td>
<td>Homework and projects</td>
</tr>
<tr>
<td>3. Convert mathematical models into computer spreadsheets</td>
<td>a, e</td>
<td>Homework, exams, and projects</td>
</tr>
<tr>
<td>4. Design and operation a small-scale water treatment system</td>
<td>a, b, c, e, k</td>
<td>Project</td>
</tr>
<tr>
<td>5. Design, construction, and load test of a reinforced concrete beam</td>
<td>a, b, c, e, k</td>
<td>Project</td>
</tr>
<tr>
<td>6. Size and locate a detention pond</td>
<td>a, c, e, k</td>
<td>Project</td>
</tr>
<tr>
<td>7. Write and present technical reports supporting engineering decision making</td>
<td>d, g</td>
<td>Projects</td>
</tr>
<tr>
<td>8. Demonstrate the ability to work in a group</td>
<td>e, g, k</td>
<td>Projects</td>
</tr>
</tbody>
</table>

Grading

The final grades for the course will be based on the following percentages:

<table>
<thead>
<tr>
<th>Components</th>
<th>Percentages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computational Homework</td>
<td>10%</td>
</tr>
<tr>
<td>Mid-Term Exam</td>
<td>20%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>25%</td>
</tr>
<tr>
<td>Project #1</td>
<td>15%</td>
</tr>
<tr>
<td>Project #2</td>
<td>15%</td>
</tr>
<tr>
<td>Project #3</td>
<td>15%</td>
</tr>
</tbody>
</table>

a) An ability to apply knowledge of mathematics, science, and engineering

b) An ability to design and conduct experiments and to analyze and interpret data in two or more of the following areas: environmental engineering, geotechnical engineering, hydraulics, and materials

c) An ability to design a civil engineering system, component, or process to meet specified performance, cost, time, safety and quality needs, and objectives
d) An ability to function on multi-disciplinary teams

e) An ability to identify, formulate, and solve civil engineering problems

f) An understanding of professional and ethical responsibility
g) An ability to convey technical material through oral presentations and written papers and reports

h) The broad education necessary to understand the impact of engineering solutions in a global and societal context

i) A recognition of the need for professional licensure and a recognition of the need for and an ability to engage in lifelong learning

j) Knowledge of contemporary issues

k) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
What is CIVL 1112?

Grading

Final letter grades will be based on the following scale which reflects the percentages as noted above.

<table>
<thead>
<tr>
<th>Exam/Homework/Projects</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>90-100</td>
<td>A</td>
</tr>
<tr>
<td>87-89</td>
<td>B+</td>
</tr>
<tr>
<td>84-86</td>
<td>B</td>
</tr>
<tr>
<td>80-83</td>
<td>B-</td>
</tr>
<tr>
<td>77-79</td>
<td>C+</td>
</tr>
<tr>
<td>74-76</td>
<td>C</td>
</tr>
<tr>
<td>70-73</td>
<td>C-</td>
</tr>
<tr>
<td>60-69</td>
<td>D</td>
</tr>
<tr>
<td>Below 60</td>
<td>F</td>
</tr>
</tbody>
</table>

Make-up Work

- Due to the nature of the class, make-up work will be very difficult to complete.
- Should the student think that they should be allowed to make-up missed work they must document, in writing, their reason(s) for being allowed to make up the missed work or to have an absence excused.
- The student will be required to submit documentation for missing the class session and should be ready to provide such evidence at the time the request is made.
- It will be up to the discretion of the instructors if work may be made up or if the absence is excused.

Project #1 – Water Treatment

Coagulation and Flocculation → Sedimentation → Gravity Filter

Influent water → Turbidity meter

Dual media filter

Flocculation tank

Sedimentation tank
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Project #1 – Water Treatment

The objective of this project is to utilize, within given constraints, a prototype water treatment system to design a full-scale system.

The effectiveness of the treatment design will be evaluated by the yearly operational and maintenance costs.

Each prototype system will be scaled-up to handle a flowrate of 20 million gallons per day (MGD).

\[
\text{Total Cost} = \text{Cost}_{\text{CF}} + \text{Cost}_{\text{S}} + \text{Cost}_{\text{F}} + \text{Cost}_{\text{FM}}
\]

where:

- \(\text{Cost}_{\text{CF}}\) are the cost of the full-scale coagulation and flocculation units;
- \(\text{Cost}_{\text{S}}\) are the costs of the full-scale sedimentation units;
- \(\text{Cost}_{\text{F}}\) are the costs of the full-scale filters; and
- \(\text{Cost}_{\text{FM}}\) are the costs of the filter materials.

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Project #2 – Reinforced Concrete Beam

The objective of this project is to develop the strongest reinforced concrete beam as measured by the strength-to-weight ratio (SWR). The strength of the beam is the ultimate load recorded during testing.

The cost of each beam will be estimated using the following cost sheet.

The SWR will be increased for cost-efficient beams and decreased for expensive beams.
Project #2 – Reinforced Concrete Beam

- Construction Engineering
- Environmental Engineering
- Geotechnical Engineering
- Structural Engineering
- Transportation Engineering
- Urban Planning
- Water Resources

Project #3 – Detention Pond Design

The objective of this project is to design a stormwater detention pond on the site assigned to your group in lab. The detention pond must provide a maximum storage of 100,000 gallons, meet all design criteria, and minimize the total cost of the project.
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Project #3 – Detention Pond Design

- Construction Engineering
- Environmental Engineering
- Geotechnical Engineering
- Structural Engineering
- Transportation Engineering
- Urban Planning
- Water Resources

What is CIVL 1112?

Technical Communications

- Intra-group and Inter-group communications
- Intra-class communications

- E-mail is a very useful tool for intra- and inter-group communications
- The instructors in CIVL 1112 will use the university email system to communicate with students
- If normally you use another e-mail account, then you need to go to http://iam.memphis.edu to make sure that mail sent to your UM account is automatically forwarded to the account you do use.

What is CIVL 1112?

Technical Communications

- Technical writing
- Technical presentations

Any questions?