**Northeastern University**

**Department of Civil and Environmental Engineering**

Instructor’s Assessment

CIVE 2331 Fluid Mechanics

**Semester / Year:** Spring / 2013 **Instructor: Onnis-Hayden Date: 05**/13/2013

Expectations regarding this course assessment:

1. Before the start of the course, review the most recent instructor assessment for recommendations on how to improve the course.
2. Up to three exams may be used to assess student learning.
3. *Questions to be asked on the in-class evaluation:*  None.
4. This assessment form is based on the set of topics and learning outcomes listed in the course syllabus. Do not change this part of the syllabus without action from the discipline group. If there is a change, notify the Undergraduate Studies Committee so that this form can be modified.
5. Complete the form and save it as a Word document with filename like this: IAssess\_2331 \_2013\_Fall

**1. What course improvements did you make? How successful were they? Relate them to recommendations made in previous course assessments.** *Expand the table as necessary.*

|  |  |
| --- | --- |
| 1. | Improve the lecture notes handouts – Very successful, almost all the students commented in favor of the handouts and how helpful they were to take notes and study the material |
| 2. | Performed several lab demonstrations, however the demonstrations were optional and done during activity time, for lack of lab time associated with the class. Considering the participation (over 95%) and the comments received it is suggested to establish a lab time for the class so that more session could be offered and more lab could be performed. |
| 3. |  |

**2. Your response to student comments and/or TRACE evaluation:** *Respond to serious criticisms and suggestions. Expand table as necessary.*

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|  | **Student Comment** | **Your Comment(s)** |
| 1. | Field trips were mentioned at the beginning of class that, understandable so, didn't happen but seeing real life application, like the labs, is really helpful. It generates more thoughts because you can actually see the theory in process. | I tried to plan the field trip but I was not able to book the field trip for the class on a convenient date. Will try again next semester. As suggested, more labs should be provided. |
| 2. | This course could be improved by integrating lab demonstrations. | Agree, see suggestion section. |
| 3. | It would be great to have weekly non-graded quizzes just to see if we understand the material. | I did biweekly quizzes, graded and not graded, I will try to put more next time; it’s good feedback for students and instructor. |
| 4. | The textbook is horrible. It is incredibly difficult to navigate. | The textbook is alright, but I have been considering changing it and will look into different book. However the students have big praises for the provided handouts, which as the students said, follow the class and prepare for tests. |

**3. Student questionnaire summary**

*Omit – does not apply.*

**4. Grade Summary**

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| --- | --- | --- | --- | --- |
| **Exam 1 question #** | **Topic** | **Average score** (0 to 100) | **% students with adequate achievement** | **Comment on any item with poor achievement** |
| M1.1 | Manometers and Pascal law | 83 | 96 |  |
| M1.2 | Fluid static- force on flat surfaces | 81 | 87 |  |
| M1.3 | Fluid static- force on curved surfaces | 84 | 93 |  |
| M1.4 | Multiple choices – fluid properties and fluid statics | 85 | 98 |  |
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| **Exam 2 question #** | **Topic** | **Average score** (0 to 100) | **% students with adequate achievement** | **Comment on any item with poor achievement** |
| M2.1 | Bernoulli equation and its application | 87 | 96 |  |
| M2.2 | Momentum equation | 84 | 96 |  |
| M2.3 | Dimension analysis | 84 | 96 |  |
| M2.4 | Multiple choices on fluid dynamic and dimension analysis | 77 | 80 |  |
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| **Final exam 3 question #** | **Topic** | **Average score** (0 to 100) | **% students with adequate achievement** | **Comment on any item with poor achievement** |
| F1. | Fluid static- force on flat surfaces | 83 | 85 |  |
| F2. | Fluid dynamic: Cavitation in pipe from tank | 89 | 98 |  |
| F3. | Pipe flow | 89 | 96 |  |
| F4. | Pump performance curve and cavitation | 81 | 96 |  |
| F5. | Open channel flow | 89 | 91 |  |
|  |  |  |  |  |

**5. Here are the topics listed on your syllabus.** For each, give an assessmentof student ability to apply knowledge and to identify, formulate, and solve problems. “Basis for assessment” should be “Grade Summary, #xxx” where xxx is the listed question involving that topic. If the topic is not covered in the grade summary, state the basis of your assessment.

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| --- | --- | --- | --- |
| **Topic** | **Assessment of student ability** | **Basis for assessment** | **Comments** |
| 1. Fundamental concepts: definition of a fluid, fluid properties, fluid statics, forces on plane and curved surfaces. | 4 | M1.1; M1.2; M1.3; M1.4; M1.5; F1 |  |
| 1. Motion of fluids: types of fluid flows, system and control volume, velocity. | 3 | M2.4 and homework |  |
| 1. Mass, momentum and energy conservation principles: continuity and Bernoulli equations. | 4 | M2.1, M2.2; M2.4; F2 and homework | We also had a demonstration of the venturi meter which was well received by the students |
| 1. Dimensional analysis: non-dimensional flow parameters, and hydraulic similitude. | 4 | M2.3 and homework |  |
| 1. Internal flows: laminar and turbulent flow, pipe friction and minor losses, Moody’s diagram, flow/velocity distribution in pipes, pipe network analysis. | 5 (Very Successful) | F3 and homework |  |
| 1. Open channel flow: uniform and non-uniform steady flow, hydraulic sections (transitions and control), critical flow, gradually varied flow, and hydraulic jump. | 4 | F5 and homework | Good comments for the lab demonstration |
| 1. Hydraulic pumps: types, selection, performance characteristic curves, and incorporation into pipe systems. | 4 | F4 and homework | Good comments for the field trip |
| 1. Laboratory demonstration of fluid viscosity; energy conservation in pipe flow; open channel flow; pump test. | 4 | Comments from student on course evaluation |  |

**6. Assessment of Program-Level Outcomes not covered in Topic Assessment**

*Omit – does not apply.*

**7. Recommendations for improving this course.** Expand the table as needed.

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| 1. | Revamp the lab demonstrations and possibly expand the number of demonstration |
| 2. | Organize a field trip |
| 3. | Consider changing the textbook |