ENGR 3345 / 060 / 061 / 063 – Fluid Mechanics Laboratory – Fall 2013

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Office Hours: 11:00-12:00 MWF, 1:00-2:00 TR, or by appointment

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Location: Q 240

Meeting times: Section 060 T 2:30-5:00 pm
Section 061 H 2:30-5:00 pm
Section 063 F 1:00 -3:30 pm

Start date: Section 060 08/20/2013
Section 061 08/22/2013
Section 063 08/23/2013

Co-requisites: ENGR 3343 Fluid Mechanics

Textbook: No textbook is required, but a fluids reference text such as the one from ENGR 3343 is desirable. Those without a book can refer to Engineering Fluid Mechanics or A First Course in Fluid Mechanics for Engineers which are both available for free download online from bookboon.com.

Course Catalog Description: The laboratory reinforces the principles of fluid mechanics, studied in ENGR 3343, as they apply to hydraulic and pneumatic power, and fluid flow. Developing experimental data into effective laboratory reports is emphasized.

Learning Outcomes:

- Understanding proper operation of pumps, fans, turbines, etc.
- Understanding the appropriate safety precautions of a laboratory environment
- Ability to properly collect reliable experimental data
- Proficiency in performing basic data analysis with the use of appropriate software tools
- Ability to generate high quality technical reports

Topics Covered Include:

- Material properties of fluids
- Fluid statics topics including hydrostatic and buoyant forces
- Flow measurement
- Major and minor losses in piping systems
- Forces produced by fluid flow such as on immersed bodies and/or by Pelton turbine
- Pump and turbine performance

Grading Policy

All students will contribute to data collection during class, and then break into groups of no more than three members to compile the results. Each laboratory exercise will be graded from a report submitted electronically by email to kmcfall@spsu.edu. Some reports will be informal in nature, requiring simply answering the requested questions and producing relevant calculations. Informal reports still must be

submitted electronically, and received before the beginning of the next laboratory session. Other reports will require a professional quality technical report, which is graded 10% on a draft report, 70% on content, 10% on report formatting, and 10% on the written text. Groups must bring a hardcopy of the draft report to the next laboratory session, when instructor feedback will be provided and a grade of 0, 5, or 10 assigned depending on the effort made in producing it. The final report will then be due electronically before the beginning of the lab session following when the draft is presented. IMPORTANT: all report submissions must be named appropriately or suffer a 5 point deduction. See each lab description for details of the file name convention, including team number, section, and lab topic.

All reports will be weighted equally in determining the final grade and the lowest report grade will be dropped. The following scale is used to assign grades:

A	90-100
B	80-89
C	70-79
D	60-69
F	0-59

Attendance Policy

Attendance during laboratory sessions is mandatory, even when reviewing draft reports. Students missing a laboratory session but collaborating with their group on the report will earn half credit on the report for that topic. A zero will be assigned for a missed session when no contribution is made on writing the report. Extenuating circumstances can warrant exceptions to these rules, but the student must come to an agreement with the instructor before the missed session or report due date.

Academic Misconduct

At SPSU, academic misconduct is defined as "any act that could have resulted in unearned advantage or that interferes with the appropriate academic progress of others". For more information see www.spsu.edu/honorcode. The application of the definition of academic misconduct in this course is describes as follows. For informal reports: all analysis and calculations must represent the work of only the individual group members; copying of any kind from any source will constitute a violation. For formal reports: any information other than basic well-known fluid mechanics equations not originating from the report authors must be properly cited. Be aware that some teams will have already completed certain labs and received instructor feedback before other teams. Discussion among teams is permissible, and even encouraged. However, sharing or consulting other team's lab reports, as either hard or soft copies, constitutes academic misconduct. All instances of academic misconduct will be reported to the SPSU Honor Council.

Disability Statement

If you have a documented disability as described by the Rehabilitation Act of 1973 and the Americans with Disabilities Act (ADA) that may require you to need assistance attaining accessibility to instructional content to meet course requirements, please contact the ATTIC at 678-915-7361 as soon as possible. It is then your responsibility to contact and meet with the instructor. The ATTIC can assist you and the instructor in formulating a reasonable accommodation plan and provide support for your disability. Course requirements will not be waived but accommodations will be made, when appropriate, to assist you to meet the requirements.

Communication

Course material will be disseminated in D2L. All official course announcements, including instructions when class may be cancelled or postponed, will be posted in the D2L course news. Be sure to check D2L regularly. When emailing the instructor, **do not** use the D2L email system; rather, email directly to kmcfall@spsu.edu.

Course Schedule

Section 060

Day	Date	Description			
		Team 01	**Team 02**	**Team 03**	**Team 04**
Tue	08/20	Report writing			
Tue	08/27	Draft report			
Tue	09/03	Fluids statics	Piping losses	Free jets	No class
Tue	09/10	Draft report	Fluids statics	Piping losses	Free jets
Tue	09/17	Free jets	Draft report	Fluids statics	Piping losses
Tue	09/24	Piping losses	Free jets	Draft report	Fluids statics
Tue	10/01	No class	No class	No class	Draft report
Tue	10/08	Viscosity	Pump performance	Pelton turbine	No class
Tue	10/15	Draft report	Viscosity	Pump performance	Pelton turbine
Tue	10/22	Pelton turbine	Draft report	Viscosity	Pump performance
Tue	10/29	Pump performance	Pelton turbine	Draft report	Viscosity
Tue	11/05	No class	No class	No class	Draft report
Tue	11/12	Open channels			
Tue	11/19	Wind tunnel demo			
Tue	11/26	No class			

Section 061

Day	Date	Description			
		Team 01	**Team 02**	**Team 03**	**Team 04**
Thu	08/15	No class			
Thu	08/22	Report writing			
Thu	08/29	Draft report			
Thu	09/05	Fluids statics	Piping losses	Free jets	No class
Thu	09/12	Draft report	Fluids statics	Piping losses	Free jets
Thu	09/19	Free jets	Draft report	Fluids statics	Piping losses
Thu	09/26	Piping losses	Free jets	Draft report	Fluids statics
Thu	10/03	No class	No class	No class	Draft report
Thu	10/10	Viscosity	Pump performance	Pelton turbine	No class
Thu	10/17	Draft report	Viscosity	Pump performance	Pelton turbine
Thu	10/24	Pelton turbine	Draft report	Viscosity	Pump performance
Thu	10/31	Pump performance	Pelton turbine	Draft report	Viscosity
Thu	11/07	No class	No class	No class	Draft report
Thu	11/14	Open channels			
Thu	11/21	Wind tunnel demo			
Thu	11/28	No class			

Section 063

Day	Date	Description			
		Team 01	**Team 02**	**Team 03**	**Team 04**
Fri	08/16	No class			
Fri	08/23	Report writing			
Fri	08/30	Draft report			
Fri	09/06	Fluids statics	Piping losses	Free jets	No class
Fri	09/13	Draft report	Fluids statics	Piping losses	Free jets
Fri	09/20	Free jets	Draft report	Fluids statics	Piping losses
Fri	09/27	Piping losses	Free jets	Draft report	Fluids statics
Fri	10/04	No class	No class	No class	Draft report
Fri	10/11	Viscosity	Pump performance	Pelton turbine	No class
Fri	10/18	Draft report	Viscosity	Pump performance	Pelton turbine
Fri	10/25	Pelton turbine	Draft report	Viscosity	Pump performance
Fri	11/01	Pump performance	Pelton turbine	Draft report	Viscosity
Fri	11/08	No class	No class	No class	Draft report
Fri	11/15	Open channels			
Fri	11/22	Wind tunnel demo			
Fri	11/29	No class			