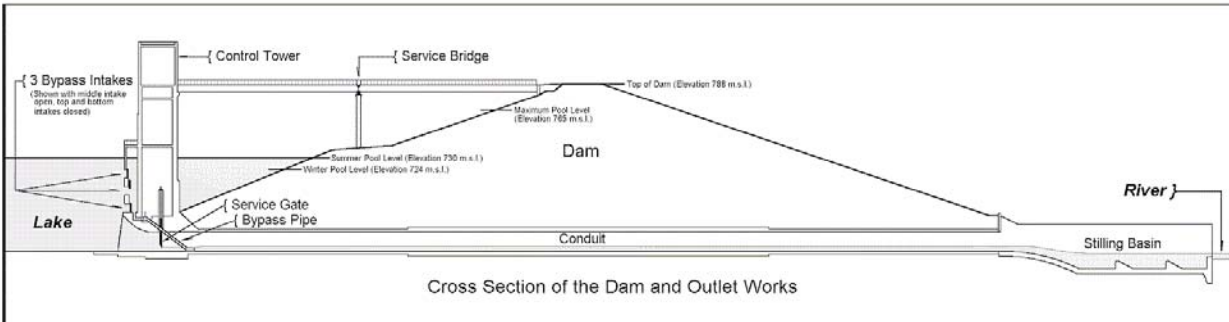


ITCM 307 - HYDROLOGY
SYLLABUS - FALL 2007
Department of Industrial and Engineering Technology
College of Science and Technology
Morehead State University



Course Description: (3-0-3); II. Prerequisites: ITCM 101, GEOS 200 or consent of instructor. A study of surface fluid flow systems. Basic areas will include closed and open channel flow, hydrologic cycles/design, and drainage/erosion control.

Instructor: Dr. Charles Patrick, Professor, P.E., C.S.I.T.
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E-mail: c.patrick@moreheadstate.edu Web: <http://www.cpatrick.info/>

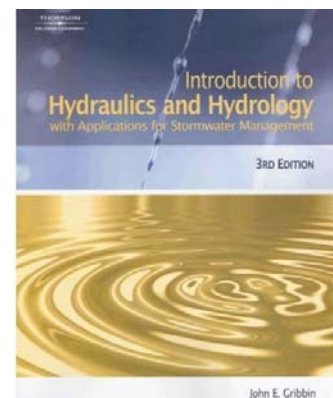
IMPORTANT:

- You are **registered** for this class at MSU but you **MUST ALSO ELECTRONICALLY ENROLL** for the class online at <http://moreheadstate.blackboard.com/>.
- Enrolling on Blackboard for ITCM 307 is not optional and **MUST** be completed immediately.
- Once enrolled, access the course online and click **Student Tools**, then **Personal Information**, then **Edit Personal Information** to update your email address and other information.
- It is **VERY IMPORTANT** to complete the Blackboard enrollment step and especially updating your email address on Blackboard.

Required Text:

Gribbin, John E. 2007. Introduction to Hydraulics and Hydrology with Applications for Stormwater Management. 3rd edition. Albany, NY: Delmar - Thomson Learning Publishers.

Course Notes: A set of course notes (\approx 100 pages) will be available on Blackboard for the class. Each student must have a 3-ring binder (1.5" minimum spine width) to retain and organize the course notes and supporting materials. In addition to the text, other readings will be assigned.



Tentative Course Outline:

<u>Week</u>	<u>Topic</u>
1. MW	Hydraulics and Hydrology, Fluid Properties
2. TTh	Fluids at Rest
3. MW	Fluids in Motion - Continuity of Flow, Conservation of Mass
4. TTh	Fluids in Motion - Conservation of Energy, Gradients
5. MW	Friction Losses
6. TTh	EXAM #1 ; Hydrologic Cycle
7. MW	Hydrologic Frequency Analysis
8. TTh	Rainfall-Runoff Estimation
9. MW	Open Channel Flow
10. TTh	Hydraulics of Structures/Reservoirs
11. MW	Channel Flow Routing
12. TTh	Sediment Properties, Transport, and Yield; EXAM #2
13. MW	Sediment Control Techniques
14. -----	Sediment Control Structures, Thanksgiving Break
15. TTh	Sediment Control Structure Design
16. MW	Monitoring and Modeling Hydrologic Systems
17. -----	FINAL EXAM (Monday, Dec. 10, 10:15 a.m. – 12:15 p.m.)

Instructional Process: The course is organized around a series of interrelated instructional topics. A significant portion of the course material is technical information that will be covered through lecture, class discussion, and small group interaction. Development of student teams is an important element of this course and team problem solving is encouraged (except on exams).

Course Competencies: Upon successful completion, the student will have gained the following competencies:

1. Discuss and perform mathematical operations of the basic concepts of fluid properties (**evaluated in Assignments #1 and #2, Exam #1, and Portfolio**).
 - Understand the basic fluid concepts of liquid shear resistance, viscosity, bulk volume, and incompressibility, specific weight, specific gravity.
 - Understand and perform computations for static liquid pressure.
 - Perform static pressure computations for various liquids.
 - Understand and perform computations for the fluid conservation of mass equation (continuity equation).
2. Demonstrate an understanding and perform mathematical operations of the static and basic dynamic behavior of fluids (**evaluated in Assignments #2 and #3, Exams #1 and #2, Final Exam, and Portfolio**).
 - Explain and mathematically prove the validity of the piezometric head formula.
 - Understand and perform computations for the hydraulic energy conversions for liquids.
 - Understand and perform computations for Bernoulli's equation.
 - Understand and perform computations for open channel flow discharge.

3. Demonstrate an understanding and perform mathematical operations of the hydrologic cycle **(evaluated in Assignments #4 and #5, Exam #2, Final Exam, and Research Project)**.
 - Understand the basic components of the hydrologic cycle including runoff, precipitation, evapo-transpiration, groundwater, soil moisture, and surface water storage.
 - Understand and perform computations for forecasting annual precipitation for an area.
4. Demonstrate an understanding and perform hydrologic frequency analysis and rainfall-runoff estimations **(evaluated in Assignments #6, #7, and #8, Exam #2, Final Exam, and Research Project)**.
 - Explain the basic principles of and factors associated with hydrologic forecasting.
 - Understand and perform computations of the hydrologic forecasting models Extreme Value and Log Pearson.
5. Demonstrate an understanding of sedimentation properties and control **(evaluated in Assignments #9, #10, and #11, Exam #2, Final Exam, and Research Project)**.
 - Understand and perform computations for accumulated runoff for both undisturbed and disturbed soil conditions.
 - Explain the use of sedimentation control structures such as the hydraulic jump, sediment basin, diversion terrace, and interceptor channel.

Assessment Techniques and Grading Description:

Exams (2 @ 100 points each).....	200
Final Exam.....	125
Assignments (8 @ 10 pts. ea. & 1 @ 20 pts.).....	100
Research Project	50
Portfolio	<u>25</u>
Total Points Possible.....	500

Attendance: Perfect and punctual attendance is expected. A role will be taken at the beginning of each class. Consistent tardiness is unacceptable; three occurrences of a student arriving late for class will equate to one absence. The following attendance bonus/penalty plan will apply to all students:

- NO absences (excused or unexcused) – 10 bonus points added to student’s final course score.
- One absence (excused or unexcused) – 5 bonus points added to student’s final course score.
- Two absences (excused or unexcused) – final course score is unaffected by absences.
- Three absences (excused or unexcused) – 25 points deducted from student’s final score.

For each subsequent absence greater than three (excused or unexcused), an additional 5 points will be deducted from the student’s final score (i.e. 4 absences = 30 points deducted; 5 absences = 35 points deducted; 6 absences = 40 points deducted; 7 absences = 45 points deducted, etc.). *The instructor retains the option to vary this attendance policy under extenuating circumstances.*

In-Class Conduct: According to the [MSU Student Handbook](#), “No student either singly or in concert with others shall abridge the personal rights of another student by willfully disrupting or preventing the peaceful and orderly conduct of classes...” Further, students are expected to respect one another, especially when in class. Disruptive or distracting behavior of any type is not allowed in class. This includes talking (excluding class discussion, of course), reading newspapers, snoring, etc. Students that disrupt the class may be asked to leave. Regarding late arrivals to class, consistent late arrivals are considered a serious disruption to the class. The instructor will maintain a written record of late arriving students. After a student accumulates three (3) late arrivals, the instructor will ask the student to leave the classroom for all other class sessions in which the student arrives late.

Cell Phones and Pagers: The use of cellular phones and pagers is common. However, the operation of a cell phone and pager during a university class is likely to disrupt the class. Therefore, **all cell phones and pagers must either be turned off or set to a silent mode of operation (e.g., vibrating rather than beeping) during class.** If you must answer a call, please quietly leave the classroom. Students whose phones disrupt the course will be asked to verbally apologize to the entire class and will be required to leave the class for the remainder of that session. The class instructor may approve an exception for special circumstances, based on a student request prior to class session.



Academic Honesty: Cheating, fabrication, plagiarism or helping others to commit these acts will **not** be tolerated. Academic dishonesty will result in severe disciplinary action including, but not limited to, failure of the student assessment item or course, and/or dismissal from MSU. If you are not sure what constitutes academic dishonesty, read *The Eagle: Student Handbook* or ask your instructor. The policy is located online in the “Student Conduct Code” at:

<http://www.moreheadstate.edu/units/studentlife/handbook/index.html>

Note: Copying information from the Internet is plagiarism if appropriate credit is not given.

Policy for Accommodating Students with Disabilities: In compliance with the Americans with Disabilities Act (ADA), all qualified students enrolled in this course are entitled to reasonable accommodations. It is the student’s responsibility to inform the instructor of any special needs before the end of the second week of class.

Campus Safety Statement: Emergency response information will be discussed in class. Students should familiarize themselves with the nearest exit routes in the event evacuation becomes necessary. You should notify your instructor at the beginning of the semester if you have special needs or will require assistance during an emergency evacuation. Students should familiarize themselves with emergency response protocols at www.moreheadstate.edu/emergency.

