FLORIDA ATLANTIC UNIVERSITY™

Graduate Programs—NEW COURSE PROPOSAL[1]

UGPC APPROVAL _____
UFS APPROVAL _____
SCNS SUBMITTAL _____
CONFIRMED _____
BANNER POSTED _____
CATALOG _____

DEPARTMENT: CIVIL, ENVIRONMENTAL AND GEOMATICS ENGINEERING

COLLEGE: ENGINEERING AND COMPUTER SCIENCE

RECOMMENDED COURSE IDENTIFICATION:

PREFIX CWR **COURSE NUMBER** 5308 **LAB CODE** (L or C) C

(TO OBTAIN A COURSE NUMBER, CONTACT MJENNING@FAU.EDU)

COMPLETE COURSE TITLE: Stormwater Modeling and Management

EFFECTIVE DATE
(first term course will be offered)

FALL 2015

CREDITS[2]: 3

TEXTBOOK INFORMATION:

1. Seybert, Thomas A.. 2006, Stormwater Management for Land Development : Methods and Calculations for Quantity Control, John Wiley & Sons ISBN-13: 978-0-471-72177-2
2. Design projects
3. Additional Materials
   - Lecture Notes Posted on FAU Blackboard
   - "Watersheds" by Paul A DeBarry, John Wiley and Sons, 2005
   - Urban Hydrology and Stormwater Quality; Engineering Applications and Computer Modeling, John Wiley, 2003
   - Stormwater Conveyance Modeling and Design, Haestad Press, 2004
   - "Applied Hydrology", Ven Te Chow, McGrawhill
   - "Water Resources Engineering", David Chin, Prentice Hall
4. Handouts provided by instructor.
5. Software and related manuals: HEC-HMS, WIN-TR55
6. Blackboard registration

GRADING *(SELECT ONLY ONE GRADING OPTION)*: **REGULAR** X **SATISFACTORY/UNSATISFACTORY** _____

COURSE DESCRIPTION, NO MORE THAN THREE LINES: The course presents a comprehensive view of stormwater modeling and management with an emphasis on current modeling techniques and design practices. The course provides an in-depth review of fundamentals of hydrology along with spatial analysis tools required for effective stormwater modeling and management.

PREREQUISITES *: NONE	**COREQUISITES*:NONE**	**REGISTRATION CONTROLS (MAJOR, COLLEGE, LEVEL)*:**

** PREREQUISITES, COREQUISITES AND REGISTRATION CONTROLS WILL BE ENFORCED FOR ALL COURSE SECTIONS.*

MINIMUM QUALIFICATIONS NEEDED TO TEACH THIS COURSE: PHD IN CIVIL ENGINEERING OR CLOSELY RELATED FIELD

Faculty contact, email and complete phone number:	Please consult and list departments that might be affected by the new course and attach comments.
Ramesh Teegavarapu , rteegava@fau.edu 1-561-297-3444	No other departments affected.

Approved by:	*Date:*	
Department Chair:	9/29/14	1. **Syllabus** must be attached; see guidelines for requirements: *www.fau.edu/provost/files/course_syllabus.2011.pdf*
College Curriculum Chair:	9/29/14	
College Dean:		2. Review **Provost Memorandum: Definition of a Credit Hour** *www.fau.edu/provost/files/Definition_Credit_Hour_Memo_2012.pdf*
UGPC Chair:	10/8/14	
Graduate College Dean:	10-15-14	
UFS President:		3. **Consent** from affected departments (attach if necessary)
Provost:		

Email this form and syllabus to *UGPC@fau.edu* **one week before** the University Graduate Programs Committee meeting so that materials may be viewed on the UGPC website prior to the meeting.

Department of Civil Environmental and Geomatics Engineering
Florida Atlantic University
Course Syllabus

1. Course title/number, number of credit hours	
Stormwater Modeling and Management CWR 5308	3 credit hours
2. Course prerequisites, corequisites, and where the course fits in the program of study	
Prerequisites: None	
3. Course logistics	
Term: Fall 2014. This is a classroom lecture course *Class location and time: TBA,* Room: TBA Homework assignments are given weekly, typically. A major design report and oral presentations are required. Examination(s) consist of one mid-term.	
4. Instructor contact information	
Instructor's name *Office address* *Office Hours* *Contact telephone number* *Email address*	Dr. Ramesh Teegavarapu, Associate Professor Engineering West (EG-36) Bldg., Room 217 Tuesday 1:00 -3:00 PM 561-297-3444 rteegava@fau.edu
5. TA contact information	
TA's name *Office address* *Office Hours* *Contact telephone number* *Email address*	No TA
6. Course description	
The course presents a comprehensive view of stormwater modeling and management with an emphasis on current modeling techniques and design practices. The course provides an in-depth review of fundamentals of hydraulics and hydrology along with spatial analysis tools required for effective stormwater modeling and management. Stormwater Modeling and Management Course will equip the students and practicing engineers with all the tools of analysis and simulation required for design and operation of stormwater systems. The course will also emphasize on the use of design codes relevant to hydrologic design of water management/drainage structures in South Florida/Florida. The course will introduce and help students/practitioners model hydrologic systems using two hydrologic simulation Models (Win-Tr55 and HEC-HMS) and use spatial analysis tool (ArcGIS) for modeling and analysis of stormwater systems.	
7. Course objectives/student learning outcomes/program outcomes	
Course objectives	A. Present the fundamental principles of hydrology and stormwater modeling and management. B. Present methods for runoff estimation, peak discharge calculations C. Present methods for design of detention basis, culverts and other

	hydrologic structures for effective management of stormwater using local codes and ordinances D. Expose students to hydrologic simulation software and make them adopt for design projects. E. Expose students to emerging stormwater management techniques concepts of green design and land use development. F. Expose students to the changing hydrologic design, protection of stormwater infrastructure under the influences of climate change and variability.
Student learning outcomes & relationship to ABET a-k objectives	Not Applicable
Relationship to program outcomes	Not Applicable

8. Course evaluation method

Homework assignments Midterm Project report/presentation Class participation	10% 30% 40% 20%	*Note*: The minimum grade required to pass the course for graduate students is B. Special Lab sessions may be conducted to explain the optimization tools and to have hands-on experience.

9. Course grading scale

There is not any fix criteria for the grading scale. The overall performance as related to course objectives and outcomes is evaluated and considered during grading.

10. Policy on makeup tests, late work, and incompletes

Makeup tests are given only if there is solid evidence of a medical or otherwise serious emergency that prevented the student of participating in the exam. Makeup exam should be administered and proctored by department personnel unless there are other pre-approved arrangements. As one worst quiz will be dropped, **there will be no make-up quizzes.**

Late work is not unacceptable.
Incomplete grades are against the policy of the department. Unless there is solid evidence of medical or otherwise serious emergency situation incomplete grades will not be given.

11. Special course requirements

None

12. Classroom etiquette policy

1. Cell phones and beepers should have the ringers turned off as a courtesy to the instructor and your fellow classmates.
2. Computers must be closed and turned off in class
3. You can leave only on breaks
4. Exams will be given only at the scheduled times and places. No make-ups, except in documented emergencies. No one is exempt from the final examination.

5. Attendance to class is required. You are expected to attend and participate in all class sessions. Final grades will be reduced by one letter for every three (3) unexcused absences (as determined by the instructor). Attendance to at least one (1) professional meeting is required.
6. You are expected to complete the assigned reading prior to the date indicated on the class schedule, to do all homework assignments, and to participate fully in the group projects.
7. Assignments are due at the beginning of class on the date indicated on the assignment sheet.

University policy requires that in order to enhance and maintain a productive atmosphere for education, personal communication devices, such as cellular phones and laptops, are to be disabled in class sessions. You are expected to complete the assigned reading prior to the date indicated on the class schedule, to do all homework assignments, and to participate fully in the group projects

13. Disability policy statement

In compliance with the Americans with Disabilities Act (ADA), students who require special accommodations due to a disability to properly execute coursework must register with the Office for Students with Disabilities (OSD) located in Boca Raton campus, SU 133 (561) 297-3880 and follow all OSD procedures.

14. Honor code policy

Consultation with your classmates on assignments is expected and encouraged; however what you turn in must be your own work. Representing the work of others as your own is unethical and may result in sanctions (see the FAU Policy on Academic Honesty). FAU is committed to a policy of honesty in academic affairs. The instructor's duty is to pursue any reasonable allegation, taking action where appropriate, as described in the appropriate section of the FAU Catalog (http://www.fau.edu/ug-cat/academic.htm#irregular) and the Florida Administrative Code. Please be advised that the copying of material from the world wide web or any other written material is considered plagiarism and is also a breach of the Honor Code.

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and place high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. See University Regulation 4.001 at www.fau.edu/regulations/chapter4/4.001_Honor_Code.pdf.

Florida Atlantic University
Regulation 4.001 Code of Academic Integrity
(1) Purpose. Students at Florida Atlantic University are expected to maintain the highest ethical standards. Dishonesty is considered a serious breach of these ethical standards, because it interferes with the University mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Dishonesty is also destructive of the University community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility.

(2) Definitions. The FAU Code of Academic Integrity prohibits dishonesty and requires a faculty member, student, or staff member to notify an instructor when there is reason to believe dishonesty has occurred in a course/program requirement. The instructor must pursue any reasonable allegation, taking action where appropriate. Examples of academic dishonesty include, but are not limited to, the following:

(A) Cheating
1. The unauthorized use of notes, books, electronic devices, or other study aids while taking an examination or working on an assignment.

2. Providing unauthorized assistance to or receiving assistance from another student during an examination or while working on an assignment.
3. Having someone take an exam or complete an assignment in one's place.
4. Securing an exam, receiving an unauthorized copy of an exam, or sharing a copy of an exam.
(B) Plagiarism
1. The presentation of words from any other source or another person as one's own without proper quotation and citation.
2. Putting someone else's ideas or facts into your own words (paraphrasing) without proper citation.
3. Turning in someone else's work as one's own, including the buying and selling of term papers or assignments.
(C) Other Forms of Dishonesty
1. Falsifying or inventing information, data, or citations.
2. Failing to comply with examination regulations or failing to obey the instructions of an examination proctor.
3. Submitting the same paper or assignment, or part thereof, in more than one class without the written consent of both instructors.
4. Any other form of academic cheating, plagiarism, or dishonesty.

(3) Procedures.
(A) If the instructor determines that there is sufficient evidence to believe that a student engaged in dishonesty, the instructor will meet with the student at the earliest possible opportunity and provide notice to the student of the instructor's perception of the

facts, the charges against the student, and the sanction. The instructor may not remove the student from the course until the appeal process has come to a conclusion.

(B) If, after this meeting, the instructor continues to believe that the student engaged in dishonesty, the instructor will provide the student written notice of the charges and the penalty. A copy of this statement shall be sent to the chair of the department or director of the school/program administering the course.

(C) The student is entitled to an opportunity to be heard at a meeting with the instructor and chair/director to review and discuss the instructor's charges/statement. Such request for a meeting must be made in writing and received by the chair/director within five (5) business days of receipt of the instructor's charges/statement. The purpose of the meeting is to discuss the facts and to advise the student of the appeal process. The chair/director will provide the student, the instructor, and the dean of the college administering the course a summary of both the student's position and the instructor's position.

(D) The student may appeal in writing to the dean of the college administering the course. The appeal must be received by the dean within five (5) business days of receipt of the chair/director's summary from the review meeting. The dean will convene a Faculty-Student Council ("Council"), which will be composed of the dean (or designee), two faculty members, and two students. The dean (or designee) will act as chair of the Council, direct the hearing, and maintain the minutes and all records of the appeal hearing, which will not be transcribed or recorded. The hearing is an educational activity subject to student privacy laws/regulations, and the strict rules of evidence do not apply. The student may choose to be accompanied by a single advisor, but only the student may speak on her/his own behalf. The student and instructor may present testimony and documents on his/her behalf. Additional witnesses may be permitted to speak at the dean's (or designee's) discretion and only if relevant and helpful to the Council. The Council will deliberate and make a recommendation to the dean to affirm or void the instructor's findings of academic dishonesty. The dean (or designee) will inform the student and instructor in writing of his/her findings of academic dishonesty after receipt of the Council's recommendation.

(E) The student may request an appeal in writing of the dean's findings of academic dishonesty to the University Provost (or designee) and include relevant documentation in support of such appeal. The University Provost (or designee) will notify the student, dean, and instructor of his/her decision in writing. This decision by the Provost (or designee) constitutes final University action.

(F) If there is a finding that the Code of Academic Integrity has been violated, the chair will notify the University Registrar that the following notation be included on both the student's official transcript and on the student's internal record: "Violation of Code of Academic Integrity, University Regulations 4.001." If such violation is appealed and overturned, the dean or University Provost (or their designees) will notify the University

Registrar that such notation should be removed from the student's transcript and internal record.

(4) Penalties.
(A) The instructor will determine the penalty to be administered to the student in the course. Penalty grades cannot be removed by drop, withdrawal, or forgiveness policy. Students should be aware that, in some Colleges/programs, failure in a course or a finding of dishonesty may result in other penalties, including expulsion or suspension from the College/program.

(B) In the case of a first offense, the student may elect to complete a peer counseling program administered by the Division of Student Affairs by the end of the semester following the semester in which the dishonesty occurred. Upon successful completion of this program, the notation regarding violation of the Code of Academic Integrity will be expunged from the student's official transcript. The grade, however, will remain unchanged and cannot be removed by drop or forgiveness policy. Also, the notation will remain in internal University student records.

(C) In the case of a repeat offense, even if the notation of violation of the Code of Academic Integrity from the first offense had been expunged from the official transcript as a result of successful completion of the peer counseling program, the student will be expelled from the University.

Specific Authority: Article IX of the Florida Constitution, 1001.706, 1001.74 F.S., Board of Governors Regulations 1.001, 6.010, and 6.0105. History–New 10-1-75, Amended 12-17-78, 3-28-84, Formerly 6C5-4.01, Amended 11-11-87. Formerly 6C5-4.001. Amended 5-26-10

See University Regulation 4.001 at www.fau.edu/regulations/chapter4/4.001_Honor_Code.pdf.

15. Required texts/reading

1. Seybert, Thomas A.. 2006, Stormwater Management for Land Development : Methods and Calculations for Quantity Control, John Wiley & Sons ISBN-13: 978-0-471-72177-2
2. Design projects
3. Additional Materials
- Lecture Notes Posted on FAU Blackboard
- "Watersheds" by Paul A DeBarry, John Wiley and Sons, 2005
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- Stormwater Conveyance Modeling and Design, Haestad Press, 2004
- "Applied Hydrology", Ven Te Chow, McGrawhill
- "Water Resources Engineering", David Chin, Prentice Hall

4. Handouts provided by instructor.
5. Blackboard registration.

16. Supplementary/recommended readings

1. Software and related manuals: HEC-HMS, WIN-TR55

17. Course topical outline, including dates for exams/quizzes, papers, completion of reading

Date	Topic
Week 1	Introduction to Stormwater modeling and management
Week 2	Basic hydrology concepts, watershed delineation, hydraulics of flow
Week 3	Runoff estimation, different methods
Week 4	Peak discharge estimation, IDF curves, stormsewer design basics, detention basins, stormsewer system layout.
Week 5	Hydrologic simulation models, lumped and distributed, Thomas model (Water Balance)
Week 6	Hydrologic design and stormsewer system design. Design codes
Week 7	Hydrologic simulation, WIN-TR 55, HEC-HMS introductions.
Week 8	*Lab exercises with simulation software, student presentations on different topics*
Week 9	Mid-term, Project Proposals : Discussion and Presentations
Week 10	Design of detention basin, Water quality aspects
Week 11	Routing of flows for detention basin using HEC-HMS
Week 12	Green Design concepts, Low impact development (LID), new concepts for land use development to improve stormwater management.
Week 13	Hydrologic Design for future, climate change and variability. Student Presentations.
Week 14	New Emerging methods: Simulation Optimization.
Week 15	**FINAL Projects due, discussions. Presentations.**
Week 16	**FINAL PRESENTATIONS**