

COURSE INFORMATION

Course Name: Design of Water Resources Systems

Course Code: CIVENG 4L04/6L04

Session Offered: Winter 2021

Calendar Description: Investigation, planning, analysis and design of water resources systems, climate change.

Introduction to GIS tools. Frequency analysis, design storms, urban drainage and analysis, floodplain analysis and flood control. Two lectures, one tutorial, one lab; one term. Prerequisite(s): CIVENG 3M03

Instructor(s): Dr. Sonia Hassini

Phone: ext. 24209

Email: hassins@mcmaster.ca

Office Hours/Contact: TBD

Class Schedule Day(s): We & Fr

Time: 3:30PM - 4:20PM

Location: Virtual

1. COURSE OBJECTIVES

The objective of this course is to learn various aspects of the design of water resources systems. This involves learning and applying advanced hydrologic and hydraulic models to watershed and floodplain analysis, including storm event analysis, effects of urbanization, and flood control (structural and non-structural) measures. The impacts of climate change on water resources design, as well as the associated mitigation and adaptation solutions will also be discussed.

2. COURSE SPECIFIC POLICIES

Course notes will be posted on avenue over the duration of the term. Posted notes are not intended to replace the lectures. Students are expected to attend and actively participate in the lectures. Tutorials will be used to practice key concepts presented in the lectures. Labs will be used to introduce software packages HEC-HMS and HEC-RAS and working on related projects.

Textbook: Water Resources Engineering, Larry W. Mays, John Wiley and Sons, Inc., 2nd or 3rd Edition

3. SCHEDULE

	Tentative Lecture Topic	Reading
WEEK 1	Water Resources Sustainability	Chapter 2
WEEK 2	Review of Hydraulic Processes	Chapter 3
WEEK 3	Hydraulic Processes: Pipe Flow	Chapter 4
WEEK 4	Hydraulic Processes: Open Channel Flow	Chapter 5
WEEK 5	Review of Hydrologic Processes Overview of HEC-HMS & HEC-RAS Projects	Chapter 7
WEEK 6	Precipitation, Evaporation, Infiltration Climate Change	Chapter 7 IPCC Reports

WEEK 7	Problem Solving & Project Presentation	Lecture Notes & Lab Manuals
WEEK 8	Surface Runoff	Chapter 8
WEEK 9	Stream Flow Routing	Chapter 9
WEEK 10	Flood Control	Chapter 14
WEEK 11	Water Resources Allocation	Lecture Notes
WEEK 12	Climate Change Project Presentations	IPCC Reports
WEEK 13	Course Review - Discussion	

The schedule may change slightly throughout the term, and any changes will be announced in class.

4. ASSESSMENT OF LEARNING	WEIGHT %
Mid-term Exam	25%
Quizzes	20%
Climate Change Project	10%
HEC-HMS & HEC-RAS Projects	40%
Participation	5%
Total	100%

5. LEARNING OUTCOMES

The students are expected to gain the following learning outcomes after taking this course:

- Competence in Specialized Engineering Knowledge (1.4)
- Ability to identify reasonable assumptions (including identification of uncertainties and imprecise information) that could or should be made before a solution path is proposed (2.1).
- Ability to identify a range of suitable engineering fundamentals (including mathematical techniques) that would be potentially useful for analyzing a technical problem (2.2).
- Ability to obtain substantiated conclusions as a result of a problem solution including recognizing the limitations of the solutions (2.3).
- Able to recognize and discuss applicable theory knowledge base (3.1).
- Capable of selecting appropriate model and methods and identify assumptions and constraints (3.2).
- Can estimate outcomes, uncertainties and determine appropriate data to collect (3.3)
- Recognizes and follows an engineering design process and principles (4.1 & 4.2)
- The ability to use of modern/state of the art tools (5.2).
- Be able to critically evaluate and apply knowledge, methods and skills procured through self directed and self identified sources, including those that lie outside the nominal course curriculum (12.1).

6. COMMUNICATIONS

It is the student's responsibility to:

- Maintain current contact information with the University, including address, phone numbers, and emergency contact information.
- Use the University provided e-mail address or maintain a valid forwarding e-mail address.
- Regularly check the official University communications channels. Official University communications are considered received if sent by postal mail, by fax, or by e-mail to the student's designated primary e-mail account via their "@mcmaster.ca" alias.
- Accept that forwarded e-mails may be lost and that e-mail is considered received if sent via the student's @mcmaster.ca alias.
- Check the McMaster/Avenue email and course websites on a regular basis during the term.

7. POLICIES

ACADEMIC INTEGRITY

You are expected to exhibit honesty and use ethical behaviour in all aspects of the learning process. Academic credentials you earn are rooted in principles of honesty and academic integrity. **It is your responsibility to understand what constitutes academic dishonesty.**

Academic dishonesty is to knowingly act or fail to act in a way that results or could result in unearned academic credit or advantage. This behaviour can result in serious consequences, e.g. the grade of zero on an assignment, loss of credit with a notation on the transcript (notation reads: "Grade of F assigned for academic dishonesty"), and/or suspension or expulsion from the university. For information on the various types of academic dishonesty please refer to the [Academic Integrity Policy](https://secretariat.mcmaster.ca/university-policies-procedures-guidelines/), located at <https://secretariat.mcmaster.ca/university-policies-procedures-guidelines/>.

The following illustrates only three forms of academic dishonesty:

- plagiarism, e.g. the submission of work that is not one's own or for which other credit has been obtained.
- improper collaboration in group work.
- copying or using unauthorized aids in tests and examinations.

AUTHENTICITY / PLAGIARISM DETECTION

Some courses may use a web-based service (Turnitin.com) to reveal authenticity and ownership of student submitted work. For courses using such software, students will be expected to submit their work electronically either directly to Turnitin.com or via an online learning platform (e.g. A2L, etc.) using plagiarism detection (a service supported by Turnitin.com) so it can be checked for academic dishonesty.

Students who do not wish their work to be submitted through the plagiarism detection software must inform the Instructor before the assignment is due. No penalty will be assigned to a student who does not submit work to the plagiarism detection software. **All submitted work is subject to normal verification that standards of academic integrity have been upheld** (e.g., on-line search, other software, etc.). For more details about McMaster's use of Turnitin.com please go to www.mcmaster.ca/academicintegrity.

COURSES WITH AN ON-LINE ELEMENT

Some courses may use on-line elements (e.g. e-mail, Avenue to Learn (A2L), LearnLink, web pages, capa, Moodle, ThinkingCap, etc.). Students should be aware that, when they access the electronic components of a course using these elements, private information such as first and last names, user names for the McMaster e-mail accounts, and program affiliation may become apparent to all other students in the same course. The available information is dependent on the technology used. Continuation in a course that uses on-line elements will be deemed consent to this disclosure. If you have any questions or concerns about such disclosure, please discuss this with the course instructor.

ONLINE PROCTORING

Some courses may use online proctoring software for tests and exams. This software may require students to turn on their video camera, present identification, monitor and record their computer activities, and/or lock/restrict their browser or other applications/software during tests or exams. This software may be required to be installed before the test/exam begins.

CONDUCT EXPECTATIONS

As a McMaster student, you have the right to experience, and the responsibility to demonstrate, respectful and dignified interactions within all of our living, learning and working communities. These expectations are described in the [Code of Student Rights & Responsibilities](#) (the “Code”). All students share the responsibility of maintaining a positive environment for the academic and personal growth of all McMaster community members, **whether in person or online.**

It is essential that students be mindful of their interactions online, as the Code remains in effect in virtual learning environments. The Code applies to any interactions that adversely affect, disrupt, or interfere with reasonable participation in University activities. Student disruptions or behaviours that interfere with university functions on online platforms (e.g. use of Avenue 2 Learn, WebEx or Zoom for delivery), will be taken very seriously and will be investigated. Outcomes may include restriction or removal of the involved students’ access to these platforms.

ACADEMIC ACCOMMODATION OF STUDENTS WITH DISABILITIES

Students with disabilities who require academic accommodation must contact [Student Accessibility Services](#) (SAS) at 905-525-9140 ext. 28652 or sas@mcmaster.ca to make arrangements with a Program Coordinator. For further information, consult McMaster University’s [Academic Accommodation of Students with Disabilities](#) policy.

REQUESTS FOR RELIEF FOR MISSED ACADEMIC TERM WORK

[McMaster Student Absence Form \(MSAF\)](#): In the event of an absence for medical or other reasons, students should review and follow the Academic Regulation in the Undergraduate Calendar “Requests for Relief for Missed Academic Term Work”.

The McMaster Student Absence Form is a self-reporting tool for **Undergraduate Students** to report absences that last up to 5 days and provides the ability to request accommodation for any missed academic work. Please note, this tool cannot be used during any final examination period. You may submit a maximum of 1 Academic Work Missed requests per term. It is **your** responsibility to follow up with your Instructor immediately regarding the nature of the accommodation. If you are absent more than 5 days or exceed 1 request per term you **must** visit your Associate Dean's Office (Faculty Office). You may be required to provide supporting documentation. This form should be filled out immediately when you are about to return to class after your absence.

ACADEMIC ACCOMMODATION FOR RELIGIOUS, INDIGENOUS OR SPIRITUAL OBSERVANCES (RISO)

Students requiring academic accommodation based on religious, indigenous or spiritual observances should follow the procedures set out in the [RISO](#) policy. Students should submit their request to their Faculty Office **normally within 10 working days** of the beginning of term in which they anticipate a need for accommodation or to the Registrar's Office prior to their examinations. Students should also contact their instructors as soon as possible to make alternative arrangements for classes, assignments, and tests.

COPYRIGHT AND RECORDING

Students are advised that lectures, demonstrations, performances, and any other course material provided by an instructor include copyright protected works. The Copyright Act and copyright law protect every original literary, dramatic, musical and artistic work, **including lectures** by University instructors.

The recording of lectures, tutorials, or other methods of instruction may occur during a course. Recording may be done by either the instructor for the purpose of authorized distribution, or by a student for the purpose of personal study. Students should be aware that their voice and/or image may be recorded by others during the class. Please speak with the instructor if this is a concern for you.

PROTECTION OF PRIVACY ACT (FIPPA)

The Freedom of Information and Protection of Privacy Act (FIPPA) applies to universities. Instructors should take care to protect student names, student numbers, grades, and all other personal information at all times. For example, the submission and return of assignments and the posting of grades must be done in a manner that ensures confidentiality – see <http://www.mcmaster.ca/univsec/fippa/fippa.cfm>.

ANTI-DISCRIMINATION

The Faculty of Engineering is concerned with ensuring an environment that is free of all discrimination. If there is a problem, individuals are reminded that they should contact the Department Chair, the Sexual Harassment Officer, or the Human Rights Consultant, as soon as possible.

https://www.mcmaster.ca/policy/General/HR/Discrimination_and_Harassment.pdf

EXTREME CIRCUMSTANCES

The University reserves the right to change the dates and deadlines for any or all courses in extreme circumstances (e.g., severe weather, labour disruptions, etc.). Changes will be communicated through regular McMaster communication channels, such as McMaster Daily News, A2L and/or McMaster email.

8. MCMASTER GRADING SCALE

Grade	Equivalent Grade Point	Equivalent Percentages
A+	12	90-100
A	11	85-89
A-	10	80-84
B+	9	77-79
B	8	73-76
B-	7	70-72
C+	6	67-69
C	5	63-66
C-	4	60-62
D+	3	57-59
D	2	53-56
D-	1	50-52
F	0	0-49