CANADORE college

COURSE NAME:	CIV320 Highway Design
Credit Value:	5
Total Course Hours:	70
Prerequisite Course(s):	CIV230
Corequisite Course(s):	None

COURSE DESCRIPTION

This course will explore the complete planning, design and construction procedure for highways. Building on basics learned in CIV230, students will enhance their understanding of the highway design process and their skills using tools such as Arc-view and Civil 3D for geometric design. The relevance of soil mechanics to highway design will be covered in terms of excavation, embankment design, drainage, and pavement design. Incorporation of structures such as bridges and overpasses will be covered including types of structures and typical applications. Hydraulics of water crossings will be reviewed so that students have a basic understanding of the design requirements related to highways. A comprehensive review of construction techniques related to highway projects will also be completed so that students have an understanding of design layout, quality control and performance monitoring aspects. Each Student will undertake a comprehensive highway design project utilizing the skills they have learned.

LAND ACKNOWLEDGEMENT

Canadore College resides on the traditional territory of the Anishinaabeg and within lands protected by the Robinson Huron Treaty of 1850. This land is occupied by the people of Nipissing First Nation since time immemorial.

PLAR INFORMATION

This course is eligible for Prior Learning Assessment and Recognition. Students are advised to discuss options with their program coordinator.

COURSE LEARNING OUTCOMES

Upon completion of this course, the student will have reliably demonstrated the ability to:

1.0 Review and determine highway design criteria including:

- 1.1 Planning and regulatory requirements.
- 1.2 Traffic Demand and Loading.
- 1.3 Ontario highway design classification and requirements.
- 1.4 Route Planning and Alternatives Review

2.0 Complete highway geometric design including:

- 2.1 Horizontal and Vertical Alignment.
- 2.2 Cross section selection and design according to Ontario standards.
- 2.3 Typical intersection and interchange configurations.

3.0 Determine appropriate Traffic Control and Operation aspects including:

- 3.1 Signs and Signals.
- 3.2 Selection of appropriate traffic channelization and calming methods.
- 3.3 Vehicular Path delineation analyses.

4.0 Understand and analyze highway geotechnical design applications including:

- 4.1 Site investigation information.
- 4.2 Highway foundation requirements.
- 4.3 Road embankment design and construction.
- 4.4 Pavement design considerations.
- 4.5 Highway drainage requirements.

5.0 Understand and analyze highway crossing structure systems including:

- 5.1 Water crossing options and hydraulic considerations.
- 5.2 Overpass systems and structural design options.
- 5.3 Environmental sensitivities and appropriate mitigation techniques.

GENERAL EDUCATION

This is not a General Education course.

PROGRAM OUTCOMES

This course contributes to the following Ministry of Colleges and Universities approved program learning outcomes (PLO):

Civil Engineering Technology

3. Complete duties and monitor that work is performed in compliance with contractual obligations, applicable laws, standards, bylaws, codes and ethical practices in the civil engineering field.
4. Promote and carry out sustainable practices in accordance with contract documents, industry standards and environmental legislative requirements.
5. Facilitate the collaboration and interaction among the project team and project stakeholders to support civil engineering projects.
6. Collect, process, analyze and coordinate technical data to produce written and graphical project-related documents.
7. Use industry-specific electronic and digital technologies to support civil engineering projects.
8. Participate in the design and modeling phase of civil engineering projects by applying engineering concepts, technical mathematics and principles of science to the review, production and/or modification of project plans.
9. Contribute to the scheduling and coordination and cost estimation of civil engineering projects and monitor their progression by applying principles of construction project management.

ESSENTIAL EMPLOYABILITY SKILLS OUTCOMES

This course contributes to the following Ministry of Colleges and Universities approved essential employability skills (EES) outcomes:

1. Communicate clearly, concisely, and correctly in the written, spoken, and visual form that fulfils the purpose and meets the needs of the audience.
2. Respond to written, spoken, or visual messages in a manner that ensures effective communication.
3. Execute mathematical operations accurately.
4. Apply a systematic approach to solve problems.
5. Use a variety of thinking skills to anticipate and solve problems.
6. Locate, select, organize, and document information using appropriate technology and information systems.
7. Analyse, evaluate, and apply relevant information from a variety of sources.
8. Show respect for the diverse opinions, values, belief systems, and contributions of others.
10. Manage the use of time and other resources to complete projects.
11. Take responsibility for one's own actions, decisions, and consequences.

EXTERNAL COURSE ACCREDITATIONS AND CONDITIONS

There are no external accreditations or conditions identified for this course.

COURSE EVALUATION

Evaluation Item	Weight

Assignment	40
Test and quizzes	20
Lab work and project	30
Professionalism	10

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COURSE PASS GRADE

50

GRADING SYSTEM

A+:	90-100%	B+:	77-79%	C+:	65-69%	D:	50-54%	S - Satisfactory
A:	85-89%	B:	73-76%	C:	60-64%	F:	0-49%	I - Incomplete
A-:	80-84%	B-:	70-72%	D+:	55-59%			F- Repeat Course, included in GPA
								FS- Failure Supplemental
								FR- Repeat course, excluded from GPA

*For a complete chart of grades and descriptions, please see the Grading Policy.

LEARNING RESOURCES

Course Textbooks:

Recommended:

Title:	Highway Engineering - Planning, Design and Operations
Author:	Findley, Schroeder Cunningham and Brown
Publisher:	
Edition:	
Print ISBN:	9780128013557, 0128013559
eBook ISBN:	

Additional Learning Resources:

Recommended: Highway Engineering - Planning, Design and Operations, Findley, Schroeder Cunningham and Brown
Required: Class Notes and provided Technical Reports and References

Please see the Campus Bookstore to verify the current textbook costs and your program page for additional program fees and/or learning material requirements (see the "Tuition Fees" and "What You Need" sections).

Resources listed on the course outline support the achievement of learning outcomes, and may be used throughout the course to varying degrees depending on the instructor's teaching methodology and the nature

of the resource.

Technology requirements - https://www.canadorecollege.ca/BYOD

The Harris Learning Library's staff can help you find resources to support your learning - www.eclibrary.ca

LEARNING ACTIVITIES

In Class instruction/discussion
Instructor demonstration
Individual hands on practice
Individual Assignments

DELIVERY MODE

This course may be delivered, in whole or in part, in a number of modalities, including In-Person, Remote (synchronous and/or asynchronous), hybrid, or Hyflex, as per accreditation and/or regulatory standards where appropriate. This information is identified on the course schedule (student and faculty).

RECORDING GUIDELINES

This class may be recorded by faculty of the College. Faculty will inform students when recording of the class commences and ceases. 'Recorded' means that the audio-visual and chat portions of the class will be recorded and then be stored on the College or vendor provider server. They will be made available to students, but only for the express and sole use of those registered in this course. If you have any questions or concerns about this recording, please contact your instructor or the College's privacy officer at privacy.officer@canadorecollege.ca. Full recording guidelines can be found at: https://cdn.agilitycms.com/canadore-college/academic-centre-of-excellence/Canadore%20Recording%20Guidelines.pdf

EXPERIENTIAL LEARNING

All full-time programs of study at Canadore College strive to provide students with the opportunity for experiential learning. This course provides students with an experiential learning opportunity through:

Workplace/Lab Simulation (EL)
Formal Course Projects (EL)

ACADEMIC POLICIES

Canadore College is committed to the highest standards of academic integrity, and expects students to adhere to these standards as part of the learning process in all environments. The College's Academic Integrity policy seeks to ensure that all students understand their rights and responsibilities in upholding academic integrity

and that students receive an accurate and fair assessment of their work. Please review the Academic Integrity policy (A-18) and other academic policies found on our website: https://www.canadorecollege.ca/about/policies.

COLLEGE POLICIES

- Protecting human rights in support of a respectful college community

For college policies please see: http://www.canadorecollege.ca/about-us/college-policies.

Accessibility Learning Services for Students with Disabilities - Student Success Services

Student Success Services provides comprehensive support to students. We aim to ensure that all students have equal access to educational opportunities and can succeed in their academic journey. Our services focus on reducing and eliminating barriers related to education through individualized accommodations and support. If you are a student with a disability, we encourage you to register with Accessible Learning by completing the Student Success – Accessible Learning Services Form (https://canadorecollege-accommodate.symplicity.com/public_accommodation/).

For more detailed information about the services offered, please visit our webpage: Student Success Services - (https://www.canadorecollege.ca/support/student-success-services). To connect with Student Success Services email studentsuccessnow@canadorecollege.ca or call 705.474.7600 ext 5205.

FIRST PEOPLES' CENTRE:

A culturally safe environment offering CONFIDENTIAL student focused services, drop in or make an appointment to access:

- One on one counselling
- Elder in residence program
- Peer tutoring
- Peer mentorship
- Lunch & learn workshops on study skills, self-care, life skills
- Learning Resource Centre

Drop by our offices at C254 College Drive, W103 Commerce Court or call 705 474 7600 Ext. 5961 College Drive / 5647 Commerce Court.

https://www.canadorecollege.ca/experience/indigenous-student-experience

WAIVER OF RESPONSIBILITY

Every attempt is made to ensure the accuracy of this information as of the date of publication. The college

reserves the right to modify, change, add, or delete content.

HISTORICAL COURSE OUTLINES

Students use course outlines to support their learning. Students are responsible for retaining course outlines for future use in applications for transfer of credit to other educational institutions.