



Certificate in Pipeline Engineering

1.0 Faculty Information

Name: Dr. Jim Lee

Email: jim_L12@hotmail.com

2.0 Course Information

Course Title and Month Year	Certificate in Pipeline Engineering May 2023
Class days (For synchronous course)	Tue, Wed or Sun
Class time (For synchronous course)	EST 14-16
Course total contact hours	36 Hrs each course
Class location	NSRIC online platform
Prerequisites and/or co-requisites	n/a
Level: A, C, E, H, I, K12, M, P, S, T, U, V, W	Undergraduate / M

Note: The below classification of courses is related any areas of knowledge:

A: Advanced level academic level courses; **C:** Canadian Immigration Training Program; **E:** Executive courses; **H:** Higher-level courses (i.e., graduate courses); **I:** Intermediate courses (i.e., university preparatory courses – Grade XII+); **K12:** Foundational, and lower-level courses; **M:** Mid-level courses (i.e., undergraduate courses); **P:** Professional courses; **S:** Short/seminar courses; **T:** Training courses; **U:** Tutorial Courses; **V:** Vocational training courses; and **W:** Workshop courses.

3.0 Professor Information

Name	Jim Lee
Title	Lecturer
Contact Information	Email: jim_L12@hotmail.com
Office Location	NSRIC online platform
Office Hours	EST 14-16 on class days

4.0 Course Description

The basic design, calculations and construction of Pipeline Engineering are presented in this course. Concepts of design, design process, design software, pipe introduction, pipe fitting, flanges, valves, pipe drafting as well as basic calculations, route selection, regulation, pipe

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materials, pipe strength and thickness, pipeline construction will be covered in this course. In addition, labs, cases, codes and specifications are also presented in the course.

5.0 Course Learning Outcomes

Upon successful completion of this course, students will be able to:

- CLO1: Become familiar with pipe and pipe components.
- CLO2: Understand basic design and pipe drafting.
- CLO3: Ability to understand properties of oil and gas.
- CLO4: Ability to understand basic calculations of pipeline design.
- CLO5: Understand the regulations of pipeline.
- CLO6: Familiarize with pipeline construction.

6.0 Course Materials

Online course materials

- 1) Online PowerPoint presentation slides in pdf form, and video/audio recording of lectures.
- 2) Additional course learning materials will be provided.

Textbook and resources

- 1) E. Shashi Menon, Barry G. Bubar etc. 2011, Pipeline Planning and Construction Field Manual.
- 2) Palmer, A.C. Arctic pipelines and the future. Journal of Pipeline Technology, 10 (2) 71-73 (2011).
- 3) Kenny, S.P., Palmer, A.C. and Been, K. Design challenges for offshore pipelines in Arctic environments. Proceedings, Stavanger (2007).
- 4) http://en.wikipedia.org/wiki/Engineering_design_process
- 5) <http://www.sciencebuddies.org/engineering-design-process/engineering-design-process-steps.shtml>
- 6) <http://en.wikipedia.org/wiki/Design>

7.0 Academic Integrity

Students are encouraged to have a look at the NSRIC's statement of academic integrity at NSRIC website. It is noted that by signing this syllabus, you will acknowledge that you have understood that any detected plagiarism should be reported.

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8.0 Assessment for Grade

The course grade is only related to the academic courses (i.e., K12, and university level courses) based on individual and team performance as shown in Table 1:

Table 1: NSRIC grading system

Type of Assessment	Grade %
Participation/Engagement/Performance	10%
Assignments	15%
Quizzes	10%
Research Project	15%
Midterm Exam	20%
Final Exam	30%
Total	100%

Important Note:

- i) The below classified courses (i.e., academic courses) will only be evaluated based on the grade system shown in Table 2. A grade and certificate will be issued for the student(s) and participant(s).
A: Advanced level academic level courses; **H:** Higher-level courses (i.e., graduate courses); **I:** Intermediate courses (i.e., university preparatory courses – Grade XII+); **K12:** Foundational, and lower-level courses; **M:** Mid-level courses (i.e., undergraduate courses).
- ii) The below classified courses will **not** be evaluated based on the grade system shown in Table 2. A certificate will be issued for the student(s) and participant(s).
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Participation/Engagement/Performance

Your participation in every aspect of the course is important for the learning process. Your engagement in every discussion in the course, due delivery of all assignments, quizzes, and research projects will be fruitful. These efforts from your side will reflect your performance in the course delivery and your commitments. This performance is the reflection of your dream grade!!

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Assignments

You will be given **3 assignments** during the course delivery. The due dates for assignments are specified in the course content and schedule section. The assignments will be given time to time to solve/answer during the term. Assignments will be posted through NSRIC online platform at least one week before they are due. Due dates are given in course schedule (tentative schedule). However, in case of any special circumstance, the date will be posted beforehand or announced in class.

Quizzes

A **Maximum of five** quizzes (maximum of **five MCQ @ five minute**) will be taken based on class lectures and performance. The quiz will be taken in the beginning of the lecture through NSRIC online platform. If you miss the quiz without any valid official excuse, you will receive **zero** for the non-attended quiz. If any student fails to attend the quiz, he/she must submit a valid reason to the Lecturer. In such case, he/she should appear another quiz or may be averaged on the quizzes that he/she attended. It will depend on the situation and Lecturer.

Research Project and presentation

Each student will be assigned a topic related to the course material by the lecturer. Each student will submit a research project report. The student will present his/her work during the class (5 min presentation + 5 min discussion). Additional information is available at term project guideline.

Midterm and Final Exams

One midterm exam and one final exam will be taken according to the NSRIC policies and guideline. The exams would be through NSRIC online platform. The midterm and final exams dates would be announced by the course Lecturer/NSRIC administration.

9.0 Grading Scale of the Course

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At the end of the term, the below Table 2 will be used for translating your marks into a “Latter Grade” based on NSRIC grading policy.

Table 2: NSRIC grading system

Marks	Letter Grade	Points	Description
≥ 93	A+	4.00	Outstanding
≥ 90	A	3.75	
≥ 87	A-	3.50	Excellent
≥ 84	B+	3.25	Very good
≥ 81	B	3.0	
≥ 78	B-	2.75	Moderately Good
≥ 75	C+	2.50	Good
≥ 72	C	2.25	
≥ 69	C-	2.0	Moderately Good
≥ 66	D+	1.75	Pass
≥ 63	D	1.50	
≥ 60	D-	1.25	Poor Pass
< 60	F	0	Failing

10.0 Advice and additional requirements

I advise you to:

- Please contact me if you need any help.
- Students are expected to attend all scheduled online lecture classes.
- Students are expected to study from the course materials and/or textbooks which will help to easily read and understand.
- Students are encouraged to write their own notes during lectures/presentations (pdf PowerPoint presentations, and additional materials if any).
- Students are encouraged to attend online platform classes on time because late-attendee disrupts the flow of the class for both the Lecturer and the other students.

Additional information (During Online Course offering Period)

- The PowerPoint course materials, and video lectures will be available at the NSRIC Platform.
- There will be scheduled discussion/tutorial sessions on **every Sunday** at the class scheduled time. All students must attend this session.

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- There will be an office hour for students on Sunday from 1:00 pm – 2:00 pm, Toronto, Canada time. Students need to send an email request so that a zoom meeting can be arranged. In addition, any time student can set up an online appointment (i.e., phone, zoom, and/or other mode of communications) based on availability of the course Lecturer. However, student should send an email request for setting up this type of meeting.

11.0 Course Topics

1. Basic Design and Pipe Drafting

- Introduction to design concept, engineering design process, how to do design, conceptual design, design cases, design software.
- Introduction pipe drafting and design.
- Steel pipe
- Pipe flanges
- Valves
- Mechanical Equipment
- Flow Diagrams and Instrumentation
- Codes and Specifications
- Isometrics

2. Basic Pipeline Design Calculations and Construction

- Elements of Pipeline Design, Major Codes and Standards, Units of Measurement.
- Physical Properties of Liquid.
- Properties of Gases
- Route Selection
- Pipeline Regulatory and Environmental Permits
- Right of Way, Alignment Sheets
- Overview of Pipeline Materials
- Pipe Strength and Wall Thickness
- Pipeline Construction

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12.0 Course Contents and Schedule

1. Basic Design and Pipe Drafting

Week	Module	Topics (lectures 2 and lab/tutorial 1 each week)	Remarks
01	Basic design	Introduction to Design, How to Do Design	
02		Design Process, , Concept Design, Design Cases, Design Software	Quiz 1
03	Pipe Drafting	Introduction, Steel Pipe	Assignment 1 due
04		Pipe Fittings I	Quiz 2
05		Pipe Fittings II	Quiz 3
06		Flanges	Assignment 2 due
07		Mid Term Exam	
08		Valves	Quiz 4
09		Mechanical Equipment, Flow Diagrams	Assignment 3 due
10		Codes and Specifications, Isometrics	Quiz 5
11	Revision	Revision	Project report due
12	Final Exam	TBA	

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2. Basic Pipeline Design Calculations and Construction

Week	Module	Topics (lectures 2 and lab/tutorial 1 each week)	Remarks
01	Basic Design Calculations	Elements of Pipeline Design, Major Codes and Standards, Units of Measurement	
02		Physical Properties of Liquid	Quiz 1
03		Properties of Gases	Assignment 1 due
04	Pipeline Construction Plan	Route Selection	Quiz 2
05		Pipeline Regulatory and Environmental Permits	Quiz 3
06		Right of Way, Alignment Sheets	Assignment 2 due
07		Mid Term Exam	
08	Pipe Calculations	Overview of Pipeline Materials	Quiz 4
09		Pipe Strength and Wall Thickness	Assignment 3 due
10	Pipeline Construction	Pipeline Construction	Quiz 5
11	Revision	Revision	Project report due
12	Final Exam	TBA	

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