CAMOSUN COLLEGE
School of Trades and Technology
Department of Civil Engineering Technology

ENGR 262
Analytical Methods
Fall - 2020

COURSE OUTLINE

Please note: This outline will not be kept indefinitely. It is recommended students keep this outline for their records, especially to assist in transfer credit to post-secondary institutions.

1   Instructor Information

Instructor	Ross Gibbs
Office hours	Please see schedule posted outside office.
Office	
Phone	Please use email Alternative:
E-mail	Gibbs@camosun.bc.ca
Website	See course Google Group.

2   Prerequisites and Co-requisites

-

3   Hours and Credits

Course Activity

		Hours / Week	Instruction – No of Weeks (Q=11; S=14; "P or S" = 7)
☒	**Lecture (Direct Instruction)**	3.0	14
☐	**Seminar (Direct Instruction)**		
☒	**Lab /Collaborative Learning**	2.0	14
☐	**Supervised Field Practice**		
☐	**Workplace Integrated Learning** *(Coop, Internship, etc.)*		
☐	**Other***(please note):*		

Credits = 3

4   Short Description

This course will cover methods in structural and fluids engineering, review statics and analysis of structure, and area properties, and include internal loads, shear and bending moment diagrams for structure, products of inertia and Mohr's circle for inertia. Topics may include force and displacement methods and fluid mechanics.

5   Intended Learning Outcomes

Upon successful completion of this course a student will be able to:

➢ Demonstrate the fundamental principles of engineering structural analysis by:
  - Preparing shear and bending moment diagrams and deflected shape of beams and frames under load,
  - Using slope deflection and moment distribution method to analyze statically indeterminate beams and frames,
  - Using matrix methods to analyze statically indeterminate 2D trusses, and
  - Determining the principal moments of inertia for common structural shapes
➢ Demonstrate the fundamental principles of engineering fluid mechanics by:
  - Calculating forces on partially of fully submerged plane and curved areas,
  - Applying Archimedes' Principle to analyze buoyancy and stability conditions with respect to floating and submerged bodies,
  - Predicting friction and minor losses for laminar and turbulent flow,
  - Selecting pumps for piping systems, and
  - Determining flow rates and pressure losses in piping systems.

6   Course Content and Schedule

See last page of this outline.

7   Recommended Materials to Assist Students to Succeed Throughout the Course

a) See last page of this outline.

8   Basis of Student Assessment

Component	Weighting %	Comments
Assignments		
Mid-term Exam		
Quizzes		
Labs		
TOTAL	0	*See last page of this outline.*

9 College Supports, Services and Policies

Immediate, Urgent, or Emergency Support
If you or someone you know requires immediate, urgent, or emergency support (e.g. illness, injury, thoughts of suicide, sexual assault, etc.), **SEEK HELP**. Resource contacts @ http://camosun.ca/about/mental-health/emergency.html or http://camosun.ca/services/sexual-violence/get-support.html#urgent

College Services
Camosun offers a variety of health and academic support services, including counselling, dental, disability resource centre, help centre, learning skills, sexual violence support & education, library, and writing centre. For more information on each of these services, visit the **STUDENT SERVICES** link on the College website at http://camosun.ca/

College Policies
Camosun strives to provide clear, transparent, and easily accessible policies that exemplify the college's commitment to life-changing learning. It is the student's responsibility to become familiar with the content of College policies. Policies are available on the College website at http://camosun.ca/about/policies/. Education and academic policies include, but are not limited to, Academic Progress, Admission, Course Withdrawals, Standards for Awarding Credentials, Involuntary Health and Safety Leave of Absence, Prior Learning Assessment, Medical/Compassionate Withdrawal, Sexual Violence and Misconduct, Student Ancillary Fees, Student Appeals, Student Conduct, and Student Penalties and Fines.

10 Grading System
☒ *Standard Grading System (GPA)*
☐ *Competency Based Grading System*

See Camosun Grading Policy E-1.5

11 Class Policies
- You must pass the final exam to pass the course
- Out of class course communication will be via a mailing list.

Week	Session	Lect (h)	Tut (h)	Eval	Chapter	Sections	Pages from	to	count	totals
1	7-Sep				Admin & Statics Review					
	9-Sep	1.5			<= ASMD Frames .					
	Lab		2		RISA					
2	14-Sep	1.5			ASMD Frames					
	16-Sep	1.5			Slope Defl (SD)[1]	1 - 3	524	555	32	
	Lab	2			Slope Defl	4	555	563	9	
3	21-Sep	1.5			Slope Defl					
	23-Sep	1.5			Slope Defl					
	Lab	2			Slope Defl					
4	28-Sep	1.5			Slope Defl					
	30-Sep	1.5			Slope Defl					
	Lab	1.5			Slope Defl					
5	5-Oct	1.5			Stiffness - Truss[2]	1 - 3	48	67	20	
	7-Oct	1.5			Stiffness - Truss	5 - 8	76	122	47	
	Lab	2			Stiffness - Truss					
6	12-Oct				🍁					
	14-Oct	1.5			Stiffness - Truss					
	Lab	2			Stiffness - Truss					108
7	19-Oct			1.5	Pre Midterm Q&A					
	21-Oct			1.5	MT					
	Lab		2		Mathcad: Introduction					
8	26-Oct	1.5			Moment Dist[3]	1 - 5	487	515	29	
	28-Oct	1.5			Moment Dist					
	Lab		2		Mathcad: Ten/Com/Shear I					
9	2-Nov	1.5			Moment Dist					
	4-Nov	1.5			Moment Dist					
	Lab		2		Mathcad: Ten/Com/Shear II					
10	9-Nov	1.5			Moment Dist					
	11-Nov				🌺					
	Lab		2		Mathcad - Axial					
11	16-Nov	1.5			Moment Dist					
	18-Nov	1.5			Moment Dist					
	Lab		2		Stiffness - MATLAB					
12	23-Nov	1.5			Moment Dist					
	25-Nov	1.5			Moment Dist					
	Lab		2		Mathcad: Torsion					
13	30-Nov	1.5			Centroids and Moments of	1 - 6	955	970	16	
	2-Dec	1.5			Inertia[4]	7 - 9	971	979	9	
	Lab		2		Mathcad: Stresses in Beams					
14	7-Dec	1.5			Centroids and Moments of Inertia					
	9-Dec	1.5								
	Lab		1	1	Lab Test + Q&A					
	Total (h)	44.0	17.0	4.0						54
			61.0					Total page count		162

Topic	Mark
Midterm	30
Final	60
Lab Test	10
	100

Out of class course communication will be via a Google mailing list.

(1)   Chapter 15 - Structural Analysis 2E, A Kassimali - beams, frames without sidesway
(2)   Chapter 3 - Matrix Analysis of Structures 1E, A Kassimali - trusses only
(3)   Chapter 12 - Structural Analysis 8E, RC Hibbeler - beams, frames without and with sidesway
(4)   Chapter 12 - Mechanics of Materials, 8E, B Goodno; JM Gere