

**DEPARTMENT OF CIVIL & ENVIRONMENTAL ENGINEERING
COLLEGE OF ENGINEERING
PRAIRIE VIEW A&M UNIVERSITY**

ASSESSMENT REPORT

CVEG 3304—STRUCTURAL ANALYSIS

FALL 2021 SEMESTER

INSTRUCTOR: Dr. Abdul M Choudhury

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Assignments are measuring and assessing the following:

ABET Criterion

7) An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Detailed Course Syllabus
(Distributed to Students at the beginning of the Semester)

Course Description in ABET Format

CVEG 3304–STRUCTURAL ANALYSIS

1.	Course number and name:	CVEG 3304 STRUCTURAL ANALYSIS
2.	Credits and contact hours:	3
3.	Instructor's or course coordinator's name:	Dr. Abdul M. Choudhury, Ph.D. in Civil Engineering
4.	Text book: Title:	“STRUCTURAL ANALYSIS”,
	Author(s):	Hibbeler, R. C.
	Publisher, Year & Edition:	10th ed. Prentice Hall,
	a. Other Supplemental Material	Class Handouts and Notes; PPT
5.	Specific course information	Credit 3 semester hours. Analysis of determinate structures; reactions, member forces of trusses, shears and bending moments of beams and frames; influence lines; moving loads; deflections; analysis of indeterminate structures by approximate method and energy method; computer application
	a. Brief description of the content of the course (catalog description)	Required
	b. Prerequisites or Co-requisites	CVEG 2063 None
	c. *Indicate whether a required, elective, or selected elective (as per definition provided) course in the program	Required
6.	a. Specific goals for the course specific outcomes of instruction (e.g., The student will be able to explain the significance of current research about a particular topic.) <i>Students will be able to</i>	b. Explicitly indicate which of the student outcomes listed in Criterion 3 or any other outcomes are addressed by the course. <i>The specific goals for the course specific outcomes listed on the left column will address the following student learning outcomes:</i>
	1. Understand and determine different types of loads considered in the design of structures	Outcome 1 (Introduced, not Measured) An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
	2. Construct and apply Influence Lines to Structural Analysis and Design	Outcome 7 An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.
	3. Determine forces and deflections in structures	Outcome 7 An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.
	4. Perform analysis on statically determinate structures	Outcome 7 An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.
	5. Perform analysis on statically indeterminate structures	Outcome 7 An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

	6. Demonstrate competency in utilization of software in structural engineering	Outcome 7 An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.
7.	TOPICS COVERED	Type of structure and loads (2 hour) Analysis of statically determinate structures (4 hours) . Analysis of statically determinate trusses.(4 hours) Internal loading developed in structural members Cables and arches (2 hours) Influence line for statically determinate structure Deflections by various methods (9 hours) Force Method of Analysis for beams and frames. Introduction of STAAD. Pro (9 hours) Slope deflection method for beams, frames without sway (4 hours) Moment distribution method (6 hours) Approximate analysis of building frames .(3 hours)



**PRAIRIE VIEW
A&M UNIVERSITY**

SYLLABUS

CVEG 3304 Structural Analysis Fall 2021

General Course Information

Information Item	Information
Instructor:	Dr. Abdul M Choudhury, Ph.D.
Section # and CRN:	P 01 , 17734
Office Location:	SR Collins Building # 316
Office Phone:	936 261 1664
Email Address:	amchoudhury@pvamu.edu
Office Hours:	TR 2.00-3.30 PM
Mode of Instruction:	Face to Face
Course Location:	Wilson 109G
Class Days & Times:	TR 9.30-10.50 AM
Catalog Description:	Credit 3 semester hours. Analysis of determinate structures; reactions, member forces of trusses, shears and bending moments of beams and frames; influence lines; moving loads; deflections; analysis of indeterminate structures by approximate method and energy method; computer application
Prerequisites:	CVEG 2063 or CVEG 2332
Co-requisites:	None
Required Text(s):	"STRUCTURAL ANALYSIS", by R. C. Hibbeler, 10th ed. Prentice Hall,
Recommended Text(s):	None

General Course Information Table

Student Learning Outcomes:

Upon successful completion of this course, students will be able to:				
		Civil Engineering Program Objectives		ABET Criteria
1	Understand and determine different types of loads considered in the design of structures	1 and 2		1
2	Construct and apply Influence Lines to Structural Analysis and Design	1 and 2		7
3	Determine forces and deflections in structures	1 and 2		7
4	Perform analysis on statically determinate structures	1 and 2		1
5	Perform analysis on statically indeterminate structures	1 and 2		7

6	Demonstrate competency in utilization of software in structural engineering.	1 and 2		7
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Table: Outcome Measures

Course	CVEG Objectives				ABET Criterion 3						
	1	2	3	4	1	2	3	4	5	6	7
CVEG 3304	x	x			x						x

x are the outcomes measured for this course

Civil Engineering Program Outcomes (Student Learning Outcomes) **ABET EAC Criterion 3 {[1] - [7] Student Outcomes (SOs)}**

- 1) an ability to identify, formulate, and solve **complex** engineering problems by applying principles of engineering, science, and mathematics
- 2) an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
- 3) an ability to communicate effectively with a range of audiences
- 4) an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
- 5) an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
- 6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
- 7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Civil Engineering Program Criteria (2019-2020)

Curriculum: The curriculum must prepare graduates to apply knowledge of mathematics through differential equations, calculus-based physics, chemistry, **and at least one additional area of basic science; apply probability and statistics to address uncertainty;** analyze and solve problems in **at least four technical areas** appropriate to civil engineering; conduct experiments in **at least two technical areas** of civil engineering and analyze and interpret the resulting data; design a system, component, or process in at least two civil engineering contexts; **include principles of sustainability in design;** explain basic concepts in **project management, business, public policy, and leadership;** analyze issues in **professional ethics;** and explain the importance of **professional licensure.**

Faculty: The program must demonstrate that faculty teaching courses that are primarily design in content are **qualified** to teach the subject matter by virtue of **professional licensure, or by education and design experience.** The program must demonstrate that it is **not critically dependent on one individual.**

Civil Engineering Program Educational Objectives (PEOs)

Graduates from the Civil Engineering program will:

1. Have careers in civil engineering or related fields that lead to increasing levels of responsibility and leadership

2. Obtain professional licensure/certifications
3. Complete graduate studies in civil engineering or related fields
4. Engage in professional development and service.

Mapping of Program Educational Objectives (PEOs) onto Program Outcomes

PEO	Objectives	CVEG Program Outcomes						
1.	Graduates from the Civil Engineering program will:	[1]	[2]	[3]	[4]	[5]	[6]	[7]
PEO 1	have careers in civil engineering or related fields that lead to increasing levels of responsibility and leadership	X	X	X	X	X	X	X
PEO 2	obtain professional licensure/certifications	X	X					
PEO 3	complete graduate studies in civil engineering or related fields	X	X	X	X		X	X
PEO 4	engage in professional development and service	X	X	X	X		X	X

Mapping of CE Courses and Student Outcomes [Beginning Fall 2019] Updated Fall 2021

Previous Course No.	New Course No.	Course Title	CE Student Outcomes/SOs						
			[1]	[2]	[3]	[4]	[5]	[6]	[7]
CVEG 1011	CVEG 1101	Introduction to Engineering							
CVEG 1021	CVEG 1102	Introduction to Civil Engineering Lab							I
CVEG 2043	CVEG 2301	Engineering Mechanics I							I
CVEG 2061	CVEG 2101	Materials & Dynamics Lab						I	
CVEG 2063	CVEG 2332	Mechanics of Materials I		I					
CVEG 2073	CVEG 2304	Global Development Issues {CORE}			I	√	I		R
CVEG 2081	CVEG 2102	Surveying & Geospatial Concepts			R			I	
CVEG 3023	CVEG 3300	Geotechnical Engineering		I					
CVEG 3031	CVEG 3100	Concrete & Steel Lab						√	
CVEG 3043	CVEG 3301	Environmental Engineering			R			√	
CVEG 3051	CVEG 3102	Professional Engineering I				√			
CVEG 3053	CVEG 3302	Transportation Engineering			R		√		
CVEG 3063	CVEG 3303	Hydraulics			√		R	√	
CVEG 3073	CVEG 3304	Structural Analysis I	I						√
CVEG 3083	CVEG 3305	Steel Design	√	√	R				
CVEG 4013	CVEG 4300	Reinforced Concrete	R	√					
CVEG 4021	CVEG 4100	Geotech Engineering Design Lab		R					√
CVEG 4043	CVEG 4301	Environmental Engineering Design	√	√	R				
CVEG 4053	CVEG 4302	Transportation Engineering Design	√				√		
CVEG 4063	CVEG 4303	Water Resources Engineering	√	√					I
CVEG 4093	CVEG 4304	Systems Engineering		√					√
CVEG 4472	CVEG 4200	Sr. Design & Professionalism I		√	√	√	√		√
CVEG 4482	CVEG 4201	Sr. Design & Professionalism II	√	√	√	√			

I – means the described outcome is introduced (not measured) but could be monitored.
 ✓ - means that the skills described in the program outcome are covered and **measured** in the course.
 R – means the described outcome is reinforce in the course (not measured) but could be monitored.
Additionally, evidence are to collected to satisfy **CE Program Criteria** covering basic concepts in **Management** (CVEG 3302, 4302, 4200, 4201, 4304), **Business** (CVEG 4304, 4200, 4201), **Public Policy** (CVEG 2304, 4200, 4201), **Professional Ethics** (CVEG 1102, 2304, 3102), Leadership (CVEG 4200, 4201), **Consideration of Sustainability** (CVEG 4301, 4302, 4303), **Importance of Professional Licensure** (CVEG 3102, 4200, 4201).

Major Course Requirements

Method of Determining Final Course Grade

Course Grade Requirement	Value	Total
1) Assignments	10%	10
2) Attendance	5%	5
3) 3 Tests @ 15% Each	45%	45
4) Quiz	10%	10
5) Final Exam (Comprehensive)	30%	30
Total:	100%	100

Course Grade Requirement Table

Grading Criteria and Conversion:

A = 90-100
 B = 80-90
 C = 70-80
 D = 60-70
 F = 0-59

Course Procedures or Additional Instructor Policies

Taskstream

Taskstream is a tool that Prairie View A&M University uses for assessment purposes. One of your assignments may be required to be submitted as an "artifact," an item of coursework that serves as evidence that course objectives are met. If applicable, more information will be provided during the semester by your department, but for general information, you can visit Taskstream via the link in eCourses.

HOMEWORK: On completion of every chapter one homework will be given.

Homework Submission

One week time will be given for completion of homework. **LATE ASSIGNMENTS UPTO ONE WEEK WILL BE ACCEPTED WITH A DEDUCTION OF 5 POINTS. ASSIGNMENTS WILL NOT BE ACCEPTED AFTER ONE WEEK!!** Your homework should be complete, neat, and professionally presented. Use the following format for all of your homework;

1. Use **only engineering paper (no graph paper)** for submitting your homework. If engineering paper is not used, 5 Points will be deducted.

2. Your homework should have a computer printed cover page on top (white paper)
 - a. Your name
 - b. Course name and section
 - c. Homework number
 - d. Date assigned
 - e. Date submitted
3. 5 points will be deducted for improper cover page.
4. Show all steps for arriving to the final answer clearly. Include all appropriate sketches.
5. Reference all figures, tables, constant values, equations, and conversions used to complete the problem.
6. Drawing of free body diagram is must for the questions which need Free body Diagram
7. Include all the appropriate units throughout the solution. Points will be deducted for answers presented without the appropriate units.
8. Start a new page for every new problem.
9. Problems should be in the order assigned.

Grading policy: For full credit you must fulfill all the criteria mentioned above.

If you do not follow appropriate steps, then deduction of score will be as follows :

- a. Late submission : 5 Points
- b. No proper cover page : 5 Points
- c. Ordinary paper other than Engineering paper : 5 Points
- d. No supporting drawing/sketch : 10%
- e. Missing of free body diagram (where required) :10%
- f. Not showing details steps of calculation : 10%
- g. Not mentioning of proper Unit or use of wrong unit : 10%
- h. Wrong answer : 10%

EXAMS – written tests designed to measure knowledge of presented course material

Exam Policy:

There will be four, closed-book and note, in-class exams throughout the semester, three during the semester and one during the scheduled final exam time. Exams will consist of some FE type questions and other will cover material from the assigned readings and lecture class activities. In general, exams will include only new material covered since the previous exam. However, some older topics may come up again on later exams.

Exam Make-up Policy: Make-up exams will be given by the end of the semester (before final exam), if the time permits. Everyone, who wants to improve any previous score are allowed for makeup exam. The make exam will replace the worst one out three tests. If the make test is the worst one, it will not be counted.

Absentee Test: If you are absent on the day of any exam, you must have a valid excuse to be allowed for absentee test. Examples of valid excuses include documented illness, university-sanctioned travel, and religious observances. Documentation of the excused absence is required PRIOR to being allowed to absentee test. If possible, notify me in advance of your absence. There will be a common absentee test by the end of semester (before final exam). The absentee for test 1, test 2 and test 3 will be combined together.

NO ABSENTEE EXAM WITHOUT DOCUMENTATION OF A TRUE EMERGENCY OR CRISIS.

Grading policy: For full credit you must support your answer by detailed calculation, neat and clean figure and free body diagram (where necessary). Also proper unit should be mentioned.

If you do not follow appropriate steps, the deduction of score will be as follows :

- a. No supporting drawing/sketch : 10%
- b. Missing of free body diagram (where required) :20%
- c. Not showing details steps of calculation : 10%
- d. Not mentioning of proper Unit or use of wrong unit : 10%
- e. Wrong answer : 10%

Quizzes - Will be taken after each important chapter to reinforce key concepts of the chapter.

Quiz Policy: At the completion of the chapter, homework will be given with one week time. The corresponding quiz date will be the date on which you submit the homework. If you are absent for the quiz without valid excuse, you will be awarded zero for the quiz. Quizzes are never repeated. However, if you are absent with valid excuse, your score

will not be entered for that particular quiz. Your average quiz score will be calculated based on other quizzes. Examples of valid excuses include documented illness, university-sanctioned travel, and religious observances. Documentation of the excused absence is required PRIOR to being allowed to absentee test. If possible, notify me in advance of your absence.

Grading Policy: Quizzes are short consisting of 10 points in each Quiz. For multiple choice questions, no credit will be given for wrong choice; even you show the calculation details. For arriving to the numerical answer problems, you will get full credit if your answer and steps are correct. For wrong answer and correct procedure you will get 50% credit.

ATTENDANCE AND CLASS PARTICIPATION – daily attendance is compulsory for the course

Attendance policy: You must fulfill the minimum attendance criteria as per Class Attendance Policy (See Catalog for Full Attendance Policy). In the grading matrix 5% is allotted for attendance.

Grading Policy: If you attend more than 90% classes, you will be awarded all 5%. If your attendance is between 80%-89%, then you will get 4% in grading matrix. All others (fulfilling the minimum attendance criteria laid down by University) will receive 3% in grading matrix. If you can answer any open question and show a better performance during the class, occasionally you may be awarded some bonus points.

Semester Calendar T- Tuesday and R- Thursday

Week	Description
Week One: Topic Description Readings: Assignment (s):	Couse introduction and course Maintenance T- Revising the pre-requisite, Type of structure and load, R- Classification of structures, Loads (Chapter-1) T- Pre-requisite Quiz
Week Two: Topic Description Readings: Assignment (S):	Statically determinate structure, Chapter 2 T- Statically Determinate Structures, principle of superposition R- determinacy and stability R- HW#1
Week Three: Topic Description Readings: Assignment (S):	Determinate truss, Chapter 3 T- Determinate truss, Method of Joints R- Zero force, Method of section T- HW#2
Week Four: Topic Description Readings: Assignment (S):	Internal loading, Chapter 4 T- Internal Loading, Shear and moment functions, R- Shear and Moment diagram for a frame, Method of superposition T-HW#3 R- Test#1
Week Five: Topic Description Readings: Assignment (S):	Cable and arches, Chapter 5 T- Cable, Three hinged Arch R- Influence lines for beams T- TBA
Week Six: Topic Description Readings: Assignment (S):	Influence lines, Chapter 6 T- Influence line for trusses, series of concentrated loads R- Absolute maximum shear and moment R- HW#4

Week Seven: Topic Description	Deflection, Chapter 7
Readings:	T- Deflection by double integration method, moment area theorem R- Conjugates beam method
Assignment (S):	R- HW #5
Week Eight: Topic Description	Force Method, Chapter 9
Readings:	T- Force Method of Analysis for beams and frames R- Introduction of STAAD. Pro
Assignment (S):	R- Hw#6
Week Nine: Topic Description	Slope deflection method, Chapter 10
Readings:	T- Slope deflection method for beams, frames without sway R- Slope deflection method for beams, frames without sway
Assignment (S):	T- Mid-term test
Week Ten: Topic Description	Moment Distribution, Chapter 11
Readings:	T- Moment distribution method for beams R- Analysis of a typical continuous beam and typical building frame by STAAD. Pro
Assignment (S):	R- TBA
Week Eleven: Topic Description	Moment Distribution, Chapter 11
Readings:	T- Moment distribution method for frames without sway R- Moment distribution method for frames with sway
Assignment (S):	R- HW # 7
Week Twelve: Topic Description	Approximate analysis of building frames, Chapter 12
Readings:	T- Portal Method of lateral load analysis. R- Cantilever method of lateral load analysis.
Assignment (S):	R- HW # 8
Week Thirteen: Topic Description	Stiffness Method of truss Analysis, Chapter 14
Readings:	T- Member stiffness matrix R- Global stiffness matrix
Assignment (S):	R- TBA
Week Fourteen: Topic Description	Stiffness Method of beam Analysis, Chapter 15
Readings:	T- Beam member stiffness matrix R- Global stiffness matrix
Assignment (S):	R- HW#9
Week Fifteen: Topic Description	STAAD Pro practice
Readings:	T- Building frame by STAAD Pro R- Test # 3
Assignment (S):	R- Test #3
Week Sixteen: Topic Description	Comprehensive Final Exam

Student Support and Success

John B. Coleman Library

The library and its partners have as their mission to provide resources and instructional material in support of the evolving curriculum, as a partner in Prairie View A&M University's mission of teaching, research, and service and to support the University's core values of access and quality, diversity, leadership, relevance, and social responsibility through emphasis on ten key areas of service. It maintains library collections and access both on campus, online, and through local agreements to further the educational goals of students and faculty. Phone: 936-261-1500; Website: [J. B. Coleman Library](#).

Academic Advising Services

Academic Advising Services offers students a variety of services that contributes to student success and leads towards graduation. We assist students with understanding university policies and procedures that affect academic progress. We support the early alert program to help students get connected to success early in the semester. We help refer students to the appropriate academic support services when the student is unsure of the best resource for their needs. Some students are supported by faculty advisors in their respective colleges. Your faculty advisor can be identified in PantherTracks. Advisors with Academic Advising Services are available to all students. We are located across campus. You can find your advisor's location by academic major at the [Academic Advising Website](#), Phone: 936-261-5911.

The University Tutoring Center

The University Tutoring Center (UTC) offers free tutoring and academic support to all registered PVAMU students. The mission of the UTC is to help provide a solid academic foundation that enables students to become confident, capable, independent learners. Competent and caring staff and peer tutors guide students in identifying, acquiring, and enhancing the knowledge, skills, and attitudes needed to reach their desired goals. Tutoring and academic support is offered face-to-face in the [UTC, in virtual face-to-face sessions](#), and through [online sessions at PVPlace](#). Other support services available for students include Supplemental Instruction, Study Break, Academic Success Workshops, and Algebra Study Jam. Location: J. B. Coleman Library, Rm. 307; Phone: 936-261-1561; Email: pvtutoring@pvamu.edu; Website: [University Tutoring Center](#).

The Writing Center

The Writing Center provides well-trained peer tutors that assist students with writing assignments at any stage of the writing process. Tutors help students with various writing tasks from understanding assignments, brainstorming, drafting, revising, editing, researching, and integrating sources. Students have free access to Grammarly online writing assistance. Grammarly is an automated proofreading and plagiarism detection tool. Student must register for Grammarly by using their student email address. In addition, students have access to face-to-face as well as virtual tutoring services either asynchronously via email or synchronously via Zoom. Location: J. B. Coleman Library, Rm. 209; Phone: 936-261-3724; Website: [The Writing Center](#); [Grammarly Registration](#).

Academic Early Alert

Academic Early Alert is a proactive system of communication and collaboration between faculty, academic advisors, and PVAMU students that is designed to support student success by promptly identifying issues and allowing for intervention. Academic Early Alert helps students by providing a central location to schedule advising appointments, view advisor contact information, and request assistance. Students who recognize that they have a problem that is negatively affecting their

academic performance or ability to continue school may self-refer an Academic Early Alert. To do so, students will log in to PVPlace and click on Academic Early Alert on the left sidebar. Phone: 936-261-5902; Website: [Academic Early Alert](#).

Student Counseling Services

The Student Counseling Services unit offers a range of services and programs to assist students in maximizing their potential for success: short-term individual, couples, and group counseling, as well as crisis intervention, outreach, consultation, and referral services. The staff is licensed by the State of Texas and provides assistance to students who are dealing with academic skills concerns, situational crises, adjustment problems, and emotional difficulties. Information shared with the staff is treated confidentially and in accordance with Texas State Law. Location: Hobart Taylor, 2nd floor; Phone: 936-261-3564; Website: [Student Counseling Services](#).

Office of Testing Services

Testing Services serves to create opportunities by offering suite of exams that aid in the students' academic and professional success. Currently we administer entrance (HESI A2), college readiness (TSI assessment), Prior Learning (CLEP, DSST), and proctored exams. Location: Wilhelmina Delco, 3rd Floor, Rm. 305; Phone: 936-261-3627; Email: aetesting@pvamu.edu; Website: [Testing Services](#).

Office of Diagnostic Testing and Disability Services

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, contact the Office of Disability Services. As a federally-mandated educational support unit, the Office of Disability Services serves as the repository for confidential disability files for faculty, staff, and students. For persons with a disability, the Office develops individualized ADA letters of request for accommodations. Other services include: learning style inventories, awareness workshops, accessibility pathways, webinars, computer laboratory with adapted hardware and software, adapted furniture, proctoring of non-standardized test administrations, ASL interpreters, ALDs, digital recorders, livescribe, and a comprehensive referral network across campus and the broader community. Location: Hobart Taylor, Rm. 1D128; Phone: 936-261-3583; Website: [Disability Services](#).

Center for Instructional Innovation and Technology Services (CIITS)

Distance Learning, also referred to as Distance Education, is the employment of alternative instructional delivery methods to extend programs and services to persons unable to attend college in the traditional manner. The Center for Instructional Innovation and Technology Services (CIITS) supports student learning through online, hybrid, web-assisted and 2-way video course delivery. For more details and contact information, visit: [CIITS Student Webpage](#); Phone: 936-261-3283.

Veteran Affairs

Veteran Services works with student veterans, current military and military dependents to support their transition to the college environment and continued persistence to graduation. The Office coordinates and certifies benefits for both the G.I. Bill and the Texas Hazlewood Act. Location: Evans Hall, Rm. 102; Phone: 936-261-3563; Website: [Veteran Affairs](#).

Office for Student Engagement

The Office for Student Engagement delivers comprehensive programs and services designed to meet the co-curricular needs of students. The Office implements inclusive and accessible programs and services that enhance student development through exposure to and participation in diverse and relevant social, cultural, intellectual, recreational, community service, leadership development and campus governance. Location: Memorial Student Center, Rm. 221; Phone: 936-261-1340; Website: [Office for Student Engagement](#).

Career Services

Career Services supports students through professional development, career readiness, and placement and employment assistance. The Office provides one-on-one career coaching, interview

preparation, resume and letter writing, and career exploration workshops and seminars. Services are provided for students at the Northwest Houston Center and College of Nursing in the Medical Center twice a month or on a requested basis. Distance Learning students are encouraged to visit the Career Services website for information regarding services provided. Location: Anderson Hall, 2nd floor; Phone: 936-261-3570; Website: [Career Services](#).

University Rules and Procedures

Academic Misconduct (See Student Planner)

You are expected to practice academic honesty in every aspect of this course and all other courses. Make sure you are familiar with your Student Planner, especially the section on academic misconduct (see *University Administrative Guidelines on Academic Integrity*). Students who engage in academic misconduct are subject to university disciplinary procedures. As listed in the PVAMU Undergraduate Catalog, Graduate Catalog, and the Student Planner, the following are examples of prohibited conduct. This list is not designed to be all-inclusive or exhaustive. In addition to academic sanctions, any student found to have committed or to have attempted to commit the following academic misconduct may also be subject to disciplinary review and action as outlined in the PVAMU Student Planner.

Forms of Academic Dishonesty:

1. Cheating: Deception in which a student misrepresents that he/she has mastered information on an academic exercise that he/she has not learned, giving or receiving aid unauthorized by the instructor on assignments or examinations. Examples: unauthorized use of notes for a test; using a "cheat sheet" on a quiz or exam; any alteration made on a graded test or exam which is then resubmitted to the teacher.
2. Plagiarism: Careless or deliberate use of the work or the ideas of another; representation of another's work, words, ideas, or data as your own without permission or appropriate acknowledgment. Examples: copying another's paper or answers, failure to identify information or essays from the Internet and submitting or representing it as your own; submitting an assignment which has been partially or wholly done by another and claiming it as yours; not properly acknowledging a source which has been summarized or paraphrased in your work; failure to acknowledge the use of another's words with quotation marks.
3. Multiple Submission: Submission of work from one course to satisfy a requirement in another course without explicit permission. Example: using a paper prepared and graded for credit in one course to fulfill a requirement and receive credit in a different course.
4. Conspiracy: Agreeing with one or more persons to commit an act of academic/scholastic dishonesty.
5. Fabrication of Information/Forgery: Use or submission of contrived, invented, forged, or altered information in any assignment, laboratory exercise, or test; tampering with or production of a counterfeit document, particularly documents which make up the student's academic record. Examples: making up a source or citing nonexistent publication or article; representing made up data as real for an experiment in a science laboratory class; forging a change of grade or student withdrawal record; falsifying any document related to a student academic exercise.

Nonacademic Misconduct (See Student Planner)

The University respects the rights of instructors to teach and students to learn. Maintenance of these rights requires campus conditions that do not impede their exercise. Campus behavior that interferes with either (1) the instructor's ability to conduct the class, or (2) the ability of students to benefit from the instructional program, or (3) the rights of others will not be tolerated. An individual engaging in such disruptive behavior may be subject to disciplinary action. Such incidents will be adjudicated by the Office for Student Conduct under nonacademic procedures.

Sexual Misconduct

Sexual harassment of students and employees at Prairie View A&M University is unacceptable and will not be tolerated. Any member of the university community violating the university's sexual harassment policy will be subject to disciplinary action. In accordance with the Texas A&M University

System guidelines, your instructor is obligated to report to the Office of Title IX Compliance (titleixteam@pvamu.edu) any instance of sexual misconduct involving a student, which includes sexual assault, stalking, dating violence, domestic violence, and sexual harassment, about which the instructor becomes aware during this course through writing, discussion, or personal disclosure. The faculty and staff of PVAMU actively strive to provide a learning, working, and living environment that promotes respect that is free from sexual misconduct, discrimination, and all forms of violence. If students, faculty, or staff would like assistance, or have questions, they may contact the Title IX Coordinator at 936-261-2144 or titleixteam@pvamu.edu. More information can be found at the [Title IX Webpage](#) including confidential resources available on campus.

Pregnancy, Pregnancy-related, and Parenting Accommodations

Title IX of the Education Amendments of 1972 prohibits sex discrimination, which includes discrimination based on pregnancy, marital status, or parental status. Students seeking accommodations related to pregnancy, pregnancy-related condition, or parenting (reasonably immediate postpartum period) are encouraged to contact Student Disability Services or the Dean of Students' Office for additional information and to request accommodations. More information can be found at this [webpage](#).

Non-Discrimination Statement

Prairie View A&M University does not discriminate on the basis of race, color, sex, religion, national origin, age, disability, genetic information, veteran status, sexual orientation or gender identity in its programs and activities. The University is committed to supporting students and complying with the Texas A&M University System non-discrimination policy. It seeks to establish an environment that is free of bias, discrimination, and harassment. If you experience an incident of discrimination or harassment, we encourage you to report it. If you would like to speak with someone who may be able to afford you privacy or confidentiality, there are individuals who can meet with you. The Director of Equal Opportunity & Diversity has been designated to handle inquiries regarding the non-discrimination policies, and can be reached at Harrington Science Building, Suite 109 or by phone 936-261-1744 or 1792.

Class Attendance Policy (See Catalog for Full Attendance Policy)

Prairie View A&M University requires regular class attendance. Attending all classes supports full academic development of each learner whether classes are taught with the instructor physically present or via distance learning technologies such as interactive video and/or internet. Excessive absenteeism, whether excused or unexcused, may result in a student's course grade being reduced or in assignment of a grade of "F". Absences are accumulated beginning with the first day of class during regular semesters and summer terms. Each faculty member will include the University's attendance policy in each course syllabus.

Student Academic Appeals Process

Authority and responsibility for assigning grades to students rests with the faculty. However, in those instances where students believe that miscommunication, errors, or unfairness of any kind may have adversely affected the instructor's assessment of their academic performance, the student has a right to appeal by the procedure listed in the University Catalog and by doing so within thirty days of receiving the grade or experiencing any other problematic academic event that prompted the complaint. Students can file Academic Complaints and/or Grade Appeals at this [webpage](#).

Technical Considerations

Minimum Recommended Hardware and Software:

- Intel PC or Laptop with Windows 10 or later version; Mac with OS High Sierra*
- Smartphone or iPad/Tablet with Wi-Fi*
- High speed Internet access
- 8 GB Memory
- Hard drive with 320 GB storage space
- 15" monitor, 800x600, color or 16 bit
- Sound card w/speakers
- Microphone and recording software
- Keyboard & mouse

- Most current version of Google Chrome, Safari or Firefox

*Smartphone, Google Chrome books and Android tablets may not be supported. iPads are the only tablets supported.

Note: Be sure to enable Java & pop-ups in the Web browser preferences

Participants should have a basic proficiency of the following computer skills:

- Sending and receiving emails
- A working knowledge of the Internet
- Microsoft Word (or a program convertible to Word)
- Acrobat PDF Reader
- Windows or Mac OS
- Video conferencing software

Netiquette (online etiquette)

Students are expected to participate in all discussions and virtual classroom chats as directed. Students are to be respectful and courteous to others on discussions boards. Foul or abusive language will not be tolerated. Do not use ALL CAPS for communicating to others AS IT CAN BE INTERPRETED AS YELLING. Avoid slang terms such as “wassup?” and texting abbreviations such as “u” instead of “you.” Limit and possibly avoid the use of emoticons. Be cautious when using humor or sarcasm as tone is sometimes lost in an email or discussion post and the message might be taken seriously or sound offensive.

Video Conferencing Etiquette

When using Zoom, WebEx or other video conferencing tools, confirm the visible area is tidy, clear of background clutter, inappropriate or offensive posters, and other distractions. Ensure you dress appropriately and avoid using high traffic or noisy areas. Stay muted when you are not speaking and avoid eating/drinking during session. Before class session begins, test audio, video and lighting to alleviate technology issues.

Technical Support

Students should go to the [Password Reset Tool](#) if they have password issues. The page will provide instructions for resetting passwords and contact information if login issues persist. For other technical questions regarding eCourses, call the Center for Instructional Innovation and Technology Services (CIITS) at 936-261-3283 or email ciits@pvamu.edu.

Communication Expectations and Standards

Emails or discussion postings will receive a response from the instructor, usually in less than 48 hours. Urgent emails should be marked as such. Check regularly for responses.

Discussion Requirement

Online courses often require minimal to no face-to-face meetings. However, conversations about the readings, lectures, materials, and other aspects of the course can take place in a seminar fashion. This will be accomplished by the use of the discussion board. The exact use of discussion will be determined by the instructor.

It is strongly suggested that students type their discussion postings in a word processing application such as Word and save it to their PC or a removable drive before posting to the discussion board. This is important for two reasons: 1) If for some reason your discussion responses are lost in your online course, you will have another copy; 2) Grammatical errors can be greatly minimized by the use of the spell-and-grammar check functions in word processing applications. Once the post(s) have been typed and corrected in the word processing application, copy and paste to the discussion board.

COVID-19 Campus Safety Measures

To promote public safety and protect students, faculty, and staff during the COVID-19 pandemic, Prairie View A&M University has adopted policies and practices for the Fall 2020 academic term to limit virus transmission. Students must observe the following practices while participating in face-to-

face courses and course-related activities (office hours, help sessions, transitioning to and between classes, study spaces, academic services, etc.):

- **Self-monitoring** - Students should follow CDC recommendations for self-monitoring. Students who have a fever or exhibit symptoms of COVID-19 should participate in class remotely and should not participate in face-to-face instruction.
- **Face Coverings** - Face coverings (cloth face covering, surgical mask, etc.) must be properly worn in all non-private spaces including classrooms, teaching laboratories, common spaces such as lobbies and hallways, public study spaces, libraries, academic resource and support offices, and outdoor spaces where 6 feet of physical distancing is difficult to reliably maintain.
- **Physical Distancing** - Physical distancing must be maintained between students, instructors, and others in course and course-related activities.
- **Classroom Ingress/Egress** - Students must follow marked pathways for entering and exiting classrooms and other teaching spaces. Students should leave classrooms promptly after course activities have concluded, should not congregate in hallways and should maintain 6-foot physical distancing when waiting to enter classrooms and other instructional spaces.
- **Face-to-face Class** - To attend a face-to-face class, students must wear a face covering (or a face shield if they have an exemption letter). If a student refuses to wear a face covering, the instructor should ask the student to leave and join the class remotely. If the student does not leave the class, the faculty member should report that student to the Office for Student Conduct for adjudication. Additionally, the faculty member may choose to teach that day's class remotely for all students.
- **COVID-19 Guidelines for Student Conduct Adjudication** - The mandatory COVID-19 Training/Certification taken by all students serves as the 1st Warning for violation of COVID-19 Guidelines.
 - 1st incident: upon review of Incident Report and finding of responsibility — Conduct Probation
 - 2nd incident: upon review of Incident Report and finding of responsibility — Suspension
 - Consult the Code of Student Conduct in the Student Planner or [Student Conduct website](#) for additional information on Conduct Probation and Suspension.
- **Personal Illness and Quarantine** - Students required to quarantine must participate in courses and course-related activities remotely and must not attend face-to-face course activities. Students should notify their instructors of the quarantine requirement. Students under quarantine are expected to participate in courses and complete graded work unless they have symptoms that are too severe to participate in course activities. Students experiencing personal injury or illness that is too severe for the student to attend class qualify for an excused absence. To receive an excused absence, students must provide appropriate documentation to the Office for Student Conduct, studentconduct@pvamu.edu.

End of Semester Course Assessment Report

This summary contains the following Information

1. Performance Statistics

- **Total number of students in class**
- **The class average performance in each course outcome assessed in this class and the four previous times course was assessed.**
- **The acceptable class average for the class in each outcome area as set by your Department.**
- **Percentage of students who scored below the expected average in each outcome.**

2. Implementation Summary

- **Brief summary of plans implemented during the semester based on last assessment report**

3. Perceived Problems

- **Instructor's critical evaluation of perceived problems that affected students' performance.**

4. New Plans for Addressing Problems

- **Instructor's plans for addressing the perceived problems the next time the class is taught.**

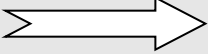
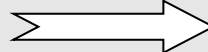
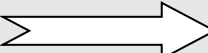
5. Overall Trend over last three assessment periods

- **Instructors summary of overall performance trend for each outcome measured over the last three periods.**

END OF SEMESTER COURSE OUTCOME ASSESSMENT REPORT
CVEG 3304- STRUCTURAL ANALYSIS
FALL 2021

Report Prepared by: Dr. Abdul M Choudhury

Report Date: Dec 19, 2021

Semester	Analysis Type	Number of Students	Outcome 7 7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.			
			Expected Class Average/	Expected Percent of students at or above average	Class Average	% Students meeting Expected Average
Fall 2020	Direct	18	70	70	78.38	83.3
Fall 2020	Direct	27	70	70	85.29	100
Fall 2019	Direct		70	70		
Fall 2018	Direct		70	70		
Implementation Summary	Items implemented from previous report or after meeting previous instructor 		Students were encouraged to review math concepts and static concepts periodically. They were encouraged to also review some special topics of maths like trigonometry, vector algebra, integral calculus. They were instructed to have a good review of mechanics of materials. Some chapter to emphasize from static is internal forces, shear force, bending moment and Moment of Inertia.			
Perceived Problems	Perceived problems are directly related to the PC and the sub items under them 		In general, about 85% of the class was able to satisfy this outcome. Others either did not practice enough problems or were very weak in applying knowledge of mathematics and statics. Very less number of students was found efficient about the concept of integral calculus; which was needed for many problem solving.			
Plans for Addressing Problems	Plans for address specific measures to address PC and their sub areas 		Students should be encouraged to review math concepts and static concepts periodically. They should be encouraged some special topics of maths like trigonometry, vector algebra, integral calculus. They should be encouraged to have a good review of Physics as well. A prerequisite test covering the relevant topics of statics and mechanics of materials should be conducted. The specific topics are to be highlighted by the Instructor.			
Overall Trend over Periods	Ascertain if there were improvements over previous semesters		Remained around 80%. Trend of enrolling big number of enrolments of students were continued in comparison to the previous years.			
Were Expectations Met?			Yes			

Grade sheet showing outcomes CVEG 3304 Structural Analysis Fall 2021

Student Roster no	Outcome 7		Average % of outcome 7
	Homework 3	Homework 4	
1	98	100	99
2	80	95	87.5
3	90	90	90
4	84	80	82
5	80	85	82.5
6	75	95	85
7		70	35
8	70	70	70
9	75	76	75.5
10	55	70	62.5
11	75	80	77.5
12	95	100	97.5
13	98		49
14	85	95	90
15	80	95	87.5
16	53	70	61.5
17	90	80	85
18	93	95	94
Maximum Marks	100	100	100
% Average	80.94	85.05	78.38

**OUTCOME SPECIFIC ASSIGNMENTS
USED TO ASSESS OUTCOMES**

ASSIGNMENTS FOR OUTCOME “7”

**An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.
(As it relates to Structural Analysis)**

OUTCOMES SPECIFIC ASSIGNMENT COVER SHEET

CVEG 3304-Structural Analysis
Instructor: Dr. Abdul M Choudhury

Title of Assignment

Homework #3

Outcome Measured Using this Assignment

Outcome 7

An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Brief justification of the suitability of this assignment for the outcome

The questions on this section of the Homework show student's ability to acquire and apply new knowledge as needed

**CIVIL AND ENVIRONMENTAL ENGINEERING DEPARTMENT
CVEG 3304- STRUCTURAL ANALYSIS
COURSE ASSIGNMENT GRADING
AND OUTCOME ASSESSMENT SHEET**

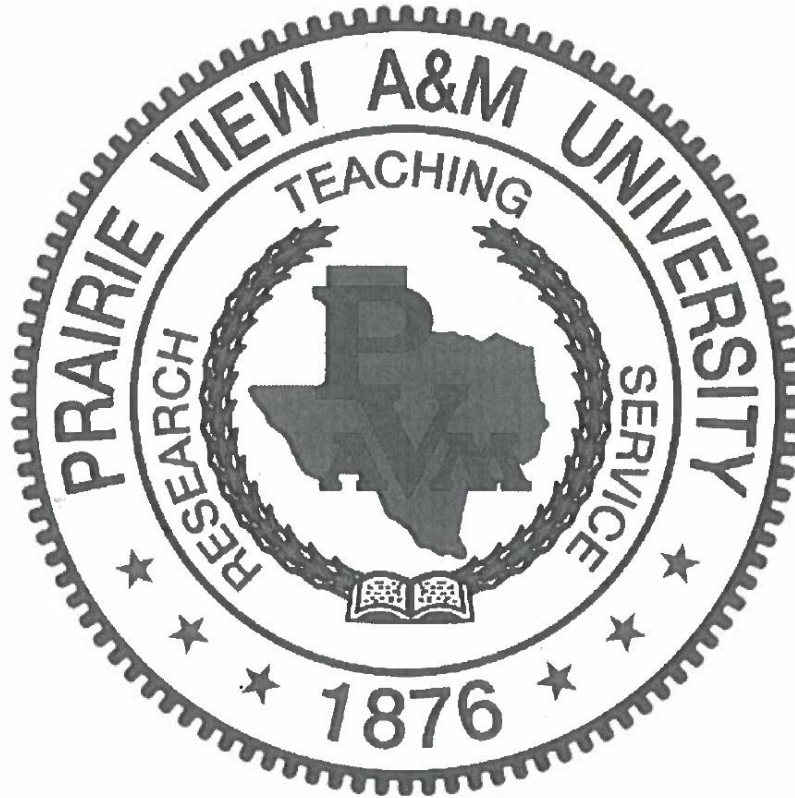
ASSIGNMENT TITLE: Homework # 3

DUE DATE: 11/02/2021_____ DATE SUBMITTED: 11/02/2021
Name of Student: Andrea Saucedo

Title of Assignment:___Influence line Diagram

Competency Area	Max for this Assignment	Student's Score
7)An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.	100	98
TOTAL	100	98

Prairie View A&M University



Andrea Saucedo (#13)

CVEG 3304 P01

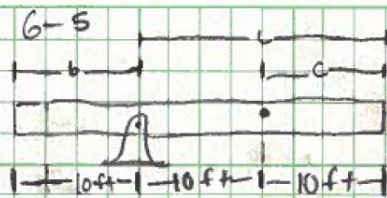
Homework #3

Date Assigned: 26 OCT 2021

Due date: 02 NOV 2021

Roster #13

98/100!
Excellent



Andrea Sauerlo

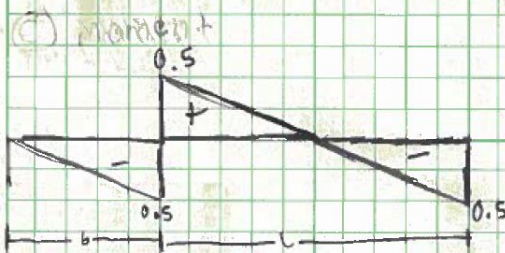
① I LD for Reaction at B



$$\frac{1}{20} = \frac{y_1}{10}$$

$$0.5 = y_1$$

② I LD for SF @ C



$$\frac{c}{L} = 0.5$$

$$\frac{b}{L} = 0.5$$

$$\frac{L-c}{L} = \frac{(20) - (10)}{20} = 0.5$$

③ Moment I LD @ C

$$\frac{10 \times 10}{20} = 5$$

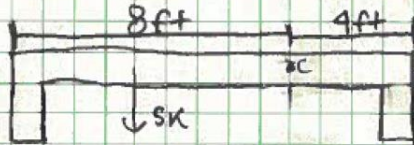
$$\frac{5}{10} = \frac{y_1}{10} \rightarrow y_1 = 5$$



6-15

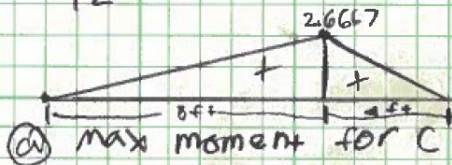
Known: $DL = 200 \text{ lb/ft}$, $LL = 5K$

Andrea Sauerdo



finding moment + ILD for C

$$\frac{8 \times 4}{12} = 2.6667$$

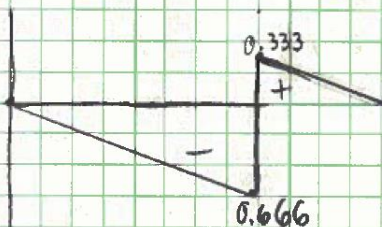


max $B_m = (2.6667)(5K) + (2.6667 \times 8 \text{ ft} \times \frac{1}{2} \times 200 \text{ lb/ft}) + (2.6667 \times 4 \text{ ft} \times \frac{1}{2} \times 200 \text{ lb/ft})$

@ C

$$\text{Max } B_m @ C = 16,533.333 \text{ lb}\cdot\text{ft} = \boxed{16.53 \text{ K}\cdot\text{ft}}$$

ILD for SF @ C



max positive shear

$$V_C = (5K)(0.333) + (0.333 \times 4 \text{ ft} \times 0.5 \times 200 \text{ lb/ft})$$

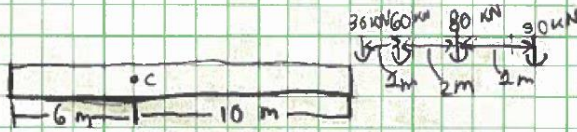
$$V_{C_{\text{max}}} = \boxed{1798.2 \text{ lb}}$$

18

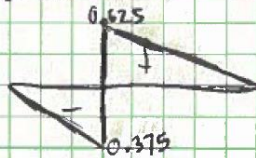
6-65

Andrea Saverio

Find Max live Shear at C



SE ILO for C



Case 1

$$(30 \text{ kN})(0.625) + (60 \text{ kN})(y_1) + 80 \text{ kN}(y_4) + 30 \text{ kN}(y_3) = 98 \text{ kN}$$

$$\frac{0.625}{10} = \frac{y_1}{9} \rightarrow y_1 = \frac{0.625 \times 9}{10} = 0.5625$$

$$\frac{0.625}{10} = \frac{y_2}{7} \rightarrow y_2 = \frac{0.625 \times 7}{10} = 0.4375$$

$$\frac{0.625}{10} = \frac{y_3}{6} \rightarrow y_3 = 0.375$$

Case 2 =

$$30 \text{ kN}(y_4) + 60 \text{ kN}(0.625) + 80 \text{ kN}(y_5) + (y_6)(30 \text{ kN}) = 81.25 \text{ kN}$$

$$\frac{y_4}{5} = \frac{-0.375}{6} \rightarrow y_4 = -0.3125$$

$$\frac{y_5}{8} = \frac{0.625}{10} \rightarrow y_5 = 0.5$$

$$\frac{y_6}{7} = \frac{0.625}{10} \rightarrow y_6 = 0.4375$$

6-65 continued
case 3

Andrea Stucedo

$$30 \text{ kN}(y_7) + 60 \text{ kN}(y_8) + 80 \text{ kN}(0.625) + 30 \text{ kN}(y_9) = 146.25 \text{ kN}$$

$$\frac{y_7}{3} = \frac{-0.375}{6} \quad y_7 = -0.1875$$

$$\frac{y_8}{4} = \frac{-0.375}{6} \rightarrow y_8 = -0.25$$

$$\frac{y_9}{9} = \frac{0.625}{10} \rightarrow y_9 = 0.5625$$

case 4 $(30 \text{ kN})(y_{10}) + (60 \text{ kN})(y_{11}) + (80 \text{ kN})(y_{12}) + 30 \text{ kN}(0.625)$

$$\frac{y_{10}}{2} = \frac{-0.375}{6} \rightarrow y_{10} = -0.125 \quad \frac{y_{11}}{3} = \frac{-0.375}{6} \rightarrow y_{11} = -0.1875$$

$$\frac{y_{12}}{5} = \frac{-0.375}{6} \rightarrow y_{12} = -0.3125$$

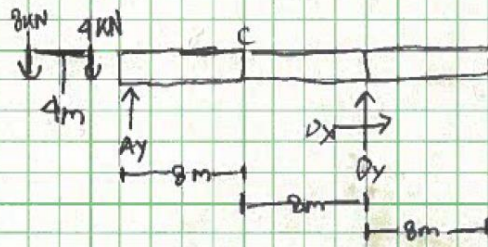
case 4 SF = -21.25 kN

max live shear 98 kN

20

6-66

Find max positive BM @ C



Loads on $R + \Delta L$

4 kN

$$\frac{8 \text{ kN}}{8 \text{ m}} = 1$$

ΔR

$$\frac{4 \text{ kN}}{8 \text{ m}} = 0.5$$

$\Delta L - \Delta R$

$$1 - 0.5 = 0.5$$

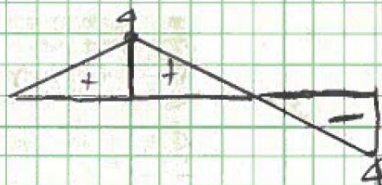
4 kN + 8 kN

0

$$\frac{12 \text{ kN}}{8 \text{ m}}$$

f.r.s

Comment: change in sign indicates maximum BM
BM ILD for C



$$\frac{8 \times 8}{6} = 4$$

max BM for C

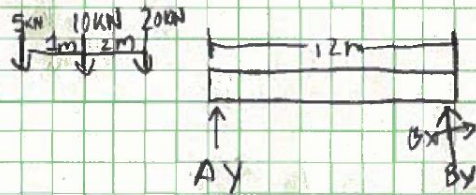
$$(4 \times 8 \text{ kN}) + (4 \times 4 \text{ kN}) = 40 \text{ kN} \cdot \text{m}$$

$$\frac{y_1}{4} = \frac{4}{8} \rightarrow y_1 = 2$$

20

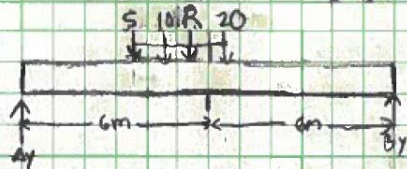
6-8.2

Andrea Sancedo

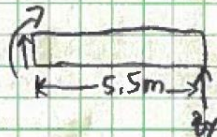


$$\bar{x} = \frac{[(5 \times 0) + (10 \times 5) + (20 \times 3)] \text{ kN} \cdot \text{m}}{[5 + 10 + 20] \text{ kN}} = \frac{70 \text{ kN} \cdot \text{m}}{35 \text{ kN}} = 2 \text{ m}$$

Assume under 20 kN all loads are in kN)

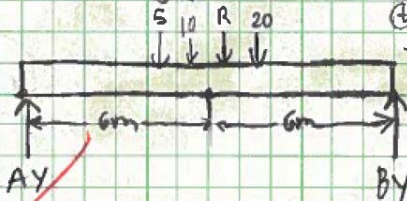


$$\begin{aligned} \sum M_A = 0 \\ -(3.5 \text{ m})(5 \text{ kN}) - (10 \text{ kN} \times 4.5 \text{ m}) - (20 \text{ kN} \times 6.5 \text{ m}) + B_y(12 \text{ m}) = 0 \\ -192.5 \text{ kN} \cdot \text{m} + B_y(12 \text{ m}) = 0 \\ B_y(12 \text{ m}) = 192.5 \text{ kN} \cdot \text{m} \rightarrow B_y = 16.0416 \text{ kN} \end{aligned}$$



$$\begin{aligned} \sum M = 0 \\ -M + B_y(5.5 \text{ m}) = 0 \\ M = B_y(5.5 \text{ m}) \rightarrow M = (16.0416 \text{ kN} \times 5.5 \text{ m}) \\ M = 88.229 \text{ kN} \cdot \text{m} \end{aligned}$$

Assume under 10 kN

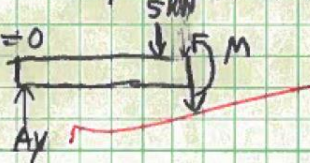


$$\begin{aligned} \sum M_B = 0 \\ -(A_y)(12 \text{ m}) + (5 \text{ kN})(7.5 \text{ m}) - (20 \text{ kN} \times 4.5 \text{ m}) - (10 \text{ kN} \times 6.5 \text{ m}) = 0 \end{aligned}$$

$$\begin{aligned} (A_y)(12 \text{ m}) - 192.5 \text{ kN} \cdot \text{m} = 0 \\ (A_y)(12 \text{ m}) = 192 \text{ kN} \cdot \text{m} \end{aligned}$$

$$A_y = 16.0416 \text{ kN}$$

$$\begin{aligned} \sum M = 0 \\ M - (5 \text{ kN})(0.5) - (16.0416 \text{ kN} \times 5.5 \text{ m}) = 0 \\ M - 2.5 \text{ kN} \cdot \text{m} - 88.229 = 0 \\ \text{Abs } B_m = M = 90.729 \text{ kN} \cdot \text{m} \end{aligned}$$



OUTCOMES SPECIFIC ASSIGNMENT COVER SHEET

CVEG 3304-Structural Analysis
Instructor: Dr. Abdul M Choudhury

Title of Assignment

Homework 4

Outcome Measured Using this Assignment

Outcome 7

An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Brief justification of the suitability of this assignment for the outcome

The questions on this section of the Homework show student's ability to acquire and apply new knowledge as needed

**CIVIL AND ENVIRONMENTAL ENGINEERING DEPARTMENT
CVEG 3304- STRUCTURAL ANALYSIS
COURSE ASSIGNMENT GRADING
AND OUTCOME ASSESSMENT SHEET**

ASSIGNMENT TITLE: Homework #4

DUE DATE: 11/09/2021_____ DATE SUBMITTED: 11/09/2021_____

Name of Student: Allyssa Raynolds

Title of Assignment:___Calculation of deflection by various methods

Competency Area	Max for this Assignment	Student's Score
Outcome 7 An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.	100	100
TOTAL	100	100



Civil Engineering Department
Prairie View A&M University
CVEG 3304(P01): Structural Analysis

Homework

Fall 2021

Homework 04

Assigned Date

November 2, 2021

Completed by

Allyssa Reynolds

Submitted by

Allyssa Reynolds

On

November 9, 2021

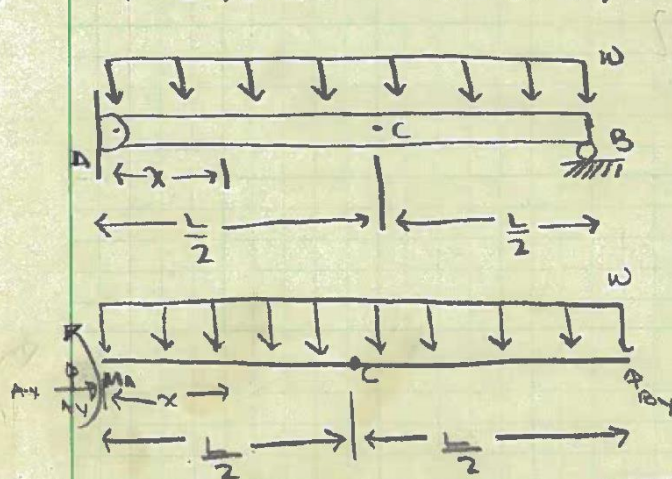
To

Dr. Abdul Choudhury

100
/ 100

7-1 (316)

Determine eq. of elastic curve using coordinate x , and specify slope @ point A & deflection @ point C. EI is constant.



$$\frac{M}{EI} = \frac{d^2w}{dx^2}$$

$$\sum M_A = 0;$$

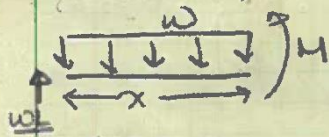
$$By(L) - w(L)\left(\frac{L}{2}\right) = 0$$

$$By(L) = \frac{wL^2}{2} \div \frac{L}{1}$$

$$By = \frac{wL}{2}$$

$$Ay = \frac{wL}{2}$$

Moment eq. @ x from A



$$\sum M = 0;$$

$$M - \frac{wL}{2}(x) + w(x)\left(\frac{x}{2}\right) = 0$$

$$M = \frac{wL}{2}(x) - \frac{wx^2}{2} \quad \text{Moment Eq.}$$

$$\int \frac{wL(x)}{2} - \int \frac{wx^2}{2}$$

$$\Rightarrow \frac{wLx^2}{4} - \frac{wx^3}{6} + C_1 \quad \frac{dV}{dx}$$

$$\int \frac{wLx^2}{4} - \int \frac{wx^3}{6}$$

$$\Rightarrow \frac{wLx^3}{12} - \frac{wx^4}{24} + C_1x + C_2 \quad \frac{dV}{dx}$$

$$V = 0 \text{ @ } x = 0, C_2 = 0$$

$$V = 0 \text{ @ } x = L, C_1 = \frac{wL^4}{12} - \frac{wL^4}{24} + C_1(L)$$

$$EI V = \frac{wLx^3}{12} - \frac{wx^4}{24} - \frac{wL^3}{24}$$

Eq. of elastic curve

Slope @ A = $x = 0$

$$\frac{dV}{dx} = \frac{wL(0)^2}{4} - \frac{w(0)^3}{6} - \frac{wL^3}{24}$$

$$= \boxed{-\frac{wL^3}{24EI}}$$

Deflection @ point C $x = \frac{L}{2}$

$$= \frac{wL}{12} \left(\frac{L}{2}\right)^3 - \frac{w}{24} \left(\frac{L}{2}\right)^4 - \frac{wL^3}{24} \left(\frac{L}{2}\right)$$

$$= \frac{wL}{12} \left(\frac{L^3}{8}\right) - \frac{wL^4}{24 \times 16} - \frac{wL^3}{24} \left(\frac{L}{2}\right)$$

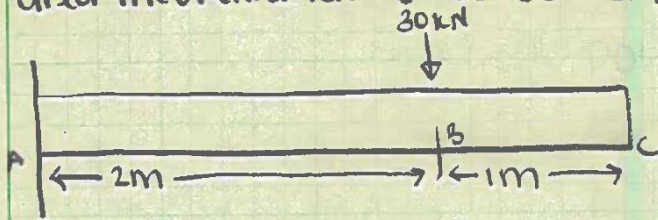
$$= \frac{wL^4}{96} - \frac{wL^4}{384} - \frac{wL^4}{48}$$

$$= \frac{wL^4}{(EI)48} \left(\frac{1}{2} - \frac{1}{8} - 1\right)$$

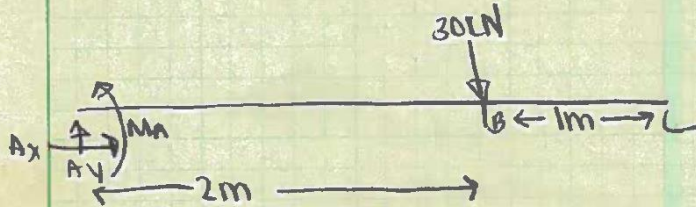
$$= \frac{wL^4}{EI(48)} \left(-\frac{5}{8}\right)$$

$$= \boxed{-\frac{5 \cdot wL^4}{EI \cdot 384}}$$

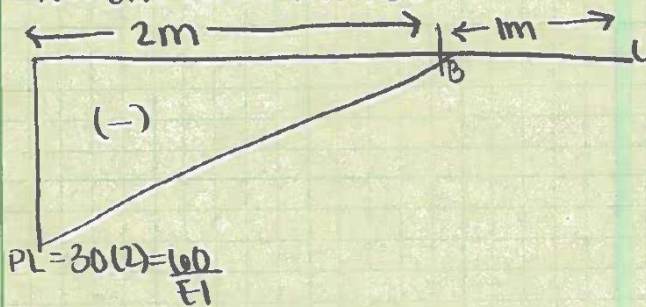
7-10(317)

 Determine slope @ B, + max. displacement Use the moment area theorems. Take $E = 200(10^9) \text{ Pa}$, $I = 550(10^6) \text{ mm}^4$


$$\theta_B - \theta_A = \Delta \theta$$



Moment-Area Method



change in slope

$$\theta_B - \theta_A = \frac{1}{2} (2) \left(-\frac{60}{EI} \right)$$

$$\theta_B - 0 = -\frac{60}{EI}$$

$$\theta_B = -\frac{60(10^3)}{200(10^9) \cdot 550(10^6)}$$

$$= -5.45 \times 10^{-4} \text{ radians}$$

Max. Displacement

@ C,

$$\Delta_C = \Delta_A + \Delta_B$$

$$= \frac{1}{2} (2) \left(-\frac{60}{EI} \right) \times \left(1 + \frac{2}{3} (2) \right)$$

$$= -\frac{60}{EI} \left(\frac{7}{3} \right)$$

$$= -420 \times 10^3 \times 10^{12}$$

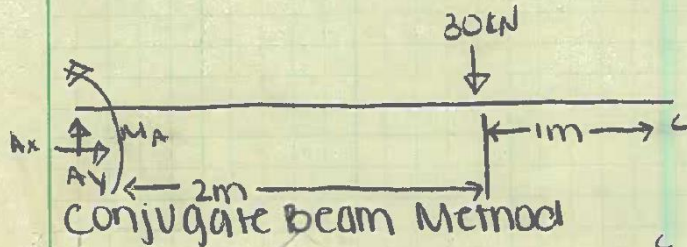
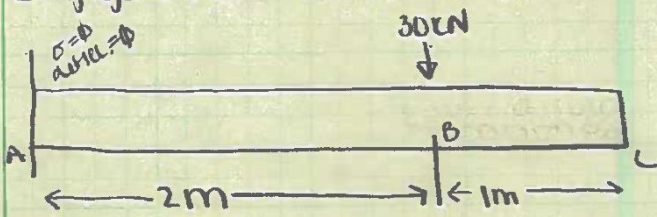
$$= \frac{3(200 \times 10^9) \times 550(10^6)}{}$$

$$= +1.27 \times 10^{-3} \text{ m} \quad \text{downward}$$

$$1.27 \text{ mm}$$

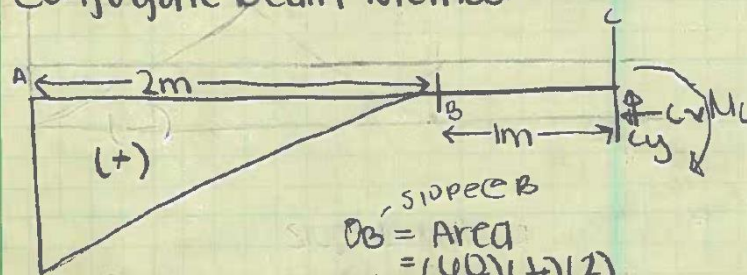
7-11 (37)

Determine slope @ B + max. displacement, use the conjugate beam method. Take $E = 200 \text{ GPa}$, $I = 550 \text{ Gmm}^4$



$A_y = 30 \text{ kN}$

$\frac{1}{3} \times 2 \times 60 = 40$



$PL = 30(2) = \frac{60}{EI}$

slope @ B

$\theta_B = \text{Area} = \frac{1}{2} \times 2 \times 60 = 60$

$\theta_B = \frac{60}{EI} = \frac{60}{200 \times 10^9 \times 550 \times 10^{-6}} = 5.45 \times 10^{-4} \text{ radians}$ (for radians)

Max deflection @ C

$M_C = A \cdot \bar{x} = \frac{1}{2} \times 2 \times 60 \times \left(\frac{2}{3} \times 2 + 1 \right) = 140$

$\Delta_C = \frac{140}{EI} = \frac{140}{200 \times 10^9 \times 550 \times 10^{-6}} = 0.00127 \text{ m}$

$\Delta_C = 1.27 \times 10^{-3} \text{ m}$ downward

$\theta_B = \int_A^B \frac{M}{EI} dx$

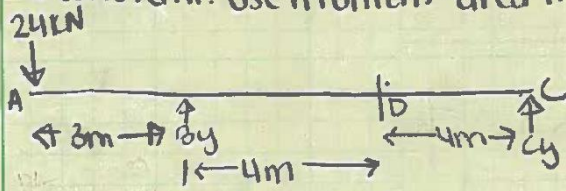
$= \int_0^2 \frac{60x}{EI} dx$

$= \left[\frac{60x^2}{2EI} \right]_0^2 = \frac{120}{EI}$

$m^0 =$

7-18(317)

Determine slope @ D, and displacement @ end A of beam. EI is constant. Use moment-area theorems.



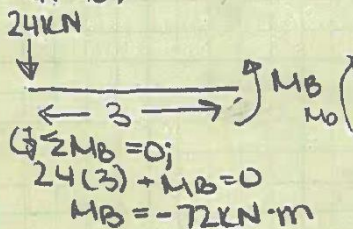
$$\begin{aligned} \sum M_C &= 0; \\ 24(11) - B_y(8) &= 0 \\ \frac{8B_y}{8} &= \frac{264}{8} \\ B_y &= 33 \text{ kN} \\ C_y &= -9 \text{ kN} \end{aligned}$$

$$\begin{aligned} \sum M_C &= 0; \\ 24(11) - 33(8) &= 0 \end{aligned}$$

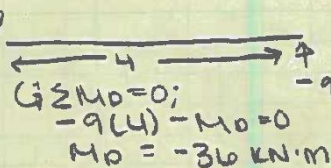
$$\begin{aligned} \sum M_A &= 0; \\ -9(11) + 33(3) &= 0 \end{aligned}$$

At B,

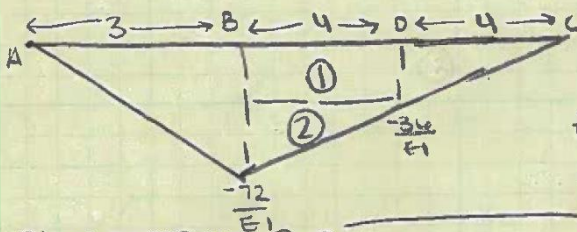
At D,



$$\begin{aligned} \sum M_B &= 0; \\ 24(3) + M_B &= 0 \\ M_B &= -72 \text{ kN}\cdot\text{m} \end{aligned}$$



$$\begin{aligned} \sum M_D &= 0; \\ -9(4) - M_D &= 0 \\ M_D &= -36 \text{ kN}\cdot\text{m} \end{aligned}$$



Slope @ D,

$$\begin{aligned} \theta_B - \theta_D &= \text{Area of } M/EI \\ \frac{t_{B/D}}{8} - \theta_D &= \frac{36(4)}{EI} + \frac{1}{2}(4) \times \frac{72-36}{EI} \end{aligned}$$

$$\frac{t_{B/D}}{8} - \theta_D = \frac{144}{EI} + \frac{72}{EI}$$

$$\begin{aligned} t_{B/D} &= \text{Area} \times \bar{x} \\ &= \frac{1}{2} \left(\frac{72}{EI} \right) (8) \times \frac{2}{3}(8) \\ &= \frac{1536}{EI} \end{aligned}$$

$$\theta_B = \frac{1536}{8EI} = \frac{192}{EI}$$

$$\frac{192}{EI} - \theta_D = \frac{216}{EI}$$

$$\theta_D = \frac{192}{EI} - \frac{216}{EI} = -\frac{24}{EI}$$

Displacement @ A

$$\begin{aligned} \delta_A &= 3 \times \theta_B \quad \theta_B = \frac{192}{EI} \\ &= 3 \times \frac{192}{EI} = \frac{576}{EI} \end{aligned}$$

$$\Delta A = \delta_A + t_{A/B}$$

$$= \frac{576}{EI} + \frac{216}{EI}$$

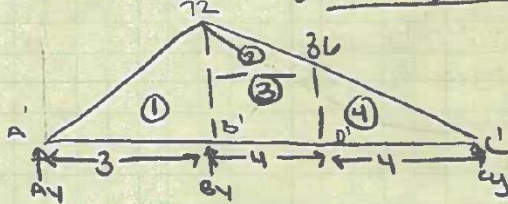
$$= \frac{792}{EI}$$

$\frac{792}{EI}$ downward

$$\begin{aligned} t_{A/B} &= \text{Area} \times \bar{x} \\ &= \frac{1}{2} \left(\frac{72}{EI} \right) (3) \times \left(\frac{3}{8} \times 3 \right) \\ &= \frac{216}{EI} \end{aligned}$$

7-19 (317)

Solve P7-18 using conjugate beam method.



$$\sum F_y = 0;$$

$$A_y + C_y =$$

Slope @ D,

$$\theta_D = \theta_D'$$

$$\theta_D = R_B' + \text{Area}_{B1A} + \text{Area}_{D1B}$$

$$= R_B' + \frac{1}{2} \left(\frac{3}{EI} \right) (7.2) + \frac{1}{2} \left(\frac{7.2 - 3.6}{EI} \right) (4) + \frac{3.6(4)}{EI}$$

$$= R_B' + \frac{10.8}{EI} + \frac{7.2}{EI} + \frac{14.4}{EI}$$

$$= R_B' + \frac{32.4}{EI}$$

$$A_y' + C_y' = \text{Area}_{C1A}$$

$$= \frac{1}{2} (11) (7.2)$$

$$A_y' + C_y' = \frac{39.6}{EI}, \quad A_y' = \frac{300}{EI}$$

$$\sum M_D = 0;$$

$$C_y'(8) - \left(\frac{1}{2} \times \frac{7.2}{EI} \times 8 \times \frac{8}{3} \right) = 0$$

$$C_y'(8) = \frac{76.8}{EI} - 8$$

$$C_y = \frac{-96}{EI}$$

$$\theta_D = \theta_D' = C_y' \left(\frac{1}{2} \times \frac{3.6}{EI} \times 4 \right)$$

$$= \frac{-96}{EI} + \frac{7.2}{EI} = \frac{-24 \text{ kN} \cdot \text{m}^2}{EI}$$

Displacement @ A

$$\Delta A = M_A' = \frac{300}{EI} (3) + \left(\frac{1}{2} \times \frac{7.2}{EI} \times 3 \times 3 \times \frac{1}{3} \right)$$

$$= \frac{900}{EI} + \left(\frac{-108}{EI} \right)$$

$$= \frac{792}{EI} = \frac{-792 \text{ kN} \cdot \text{m}^2}{EI} = \Delta A$$