

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

ASSESSMENT REPORT

CVEG 3100 STEEL & CONCRETE LAB

FALL 2021 SEMESTER

INSTRUCTOR: Dr. Abdul M Choudhury

TABLE OF CONTENTS

- 1. Cover Page**
- 2. Detailed Course Syllabus (ABET + Additional Information)**
- 3. End of Semester Outcomes Assessment Report (New Format)**
- 4. Grade Sheet Showing Student and Class Performance in Outcomes**
- 5. Supporting Outcome Specific Assignments**

Assignments are measuring and assessing the following:

ABET Criterion

6) An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

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

Course Description in ABET Format

CVEG 3100 CONCRETE & STEEL LABORATORY

1.	Course number and name:	CVEG 3100 CONCRETE & STEEL LABORATORY
2.	Credits and contact hours:	1 credit hour; 3 contact hours
3.	Instructor's or course	Dr. Abdul M. Choudhury
4.	Text book: Title:	Materials for Civil and Construction Engineers
	Author:	Mamlouk and Zaniewski.
	Publisher, Year & Edition:	Pearson, 2017, 4 th Edition
	a. Other Supplemental material	Class Handouts and Notes; PPT
5.	Specific course information	
	a. Brief description of the content of the course (catalog description)	Determination of mechanical properties of several engineering materials, including iron-carbon alloys, aluminum alloys, cement, concrete and its ingredients, standards methods of testing and procedures; instrumentation and interpretation of results; and presentation of results in reports and report writing.
	b. Prerequisites or Co-requisites	CVEG 2063 CVEG 2061 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 .Safely conduct laboratory tests on materials commonly used in civil engineering projects.	Outcome 6 An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
	2. Interpret the results of the laboratory tests to determine the suitability of the material for a project.	Outcome 6 An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
	3. Design, mix and test a batch of Portland cement concrete to	Outcome 6 An ability to develop and conduct appropriate

	meet given specifications.	experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
	4. Write concise and coherent laboratory reports.	Outcome 6 An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7.	Brief list of topics to be covered	Charpy Impact test (3 hours) Tensile Test of Steel (3 hours) Torsion test on Steel (3 hours) Hardness Test of Steel (3 hours) .Gradation, Specific Gravity , water absorption of aggregates (12 hours) Normal Consistency, initial and final setting time of cement (12 hours) 7 days, 14 days, 21 days and 28 days compression test on concrete cylinders (6 hours)



PRAIRIE VIEW
A&M UNIVERSITY

SYLLABUS

**CVEG 3100
CONCRETE & STEEL LABORATORY
FALL 2021**

Instructor: Dr. Abdul M Choudhury, Ph.D.
Section # and CRN: Section P81 , CRN 17729
Office Location: S R COLLINS #316
Office Phone: 936-261-1664
Email Address: amchoudhury@pvamu.edu :
Office Hours: W 9.30 A.M- 12.30 PM
Mode of Instruction: Face to Face

Course Location: GIL 109
Class Days & Times: M 3.00- 5.50 PM

Catalog Description: Determination of mechanical properties of several engineering materials, including iron-carbon alloys, aluminum alloys, cement, concrete and its ingredients, standards methods of testing and procedures; instrumentation and interpretation of results; and presentation of results in reports and report writing.

Prerequisites: CVEG 2063 or CVEG 2332 and CVEG 2061 or CVEG 2101
Co-requisites: None

Required Texts: None. Notes will be distributed in class, emailed to students, or provided on a thumb drive or disk that students will share.

Recommended Texts: An engineering materials textbook such as Materials for Civil and Construction Engineers, 4th edition by Mamlouk and Zaniewski. ISBN: 10-0-13-611058-4. Check the library for this and other related text books.

The following policy is only for students who have declared a major (Engineering, Computer Science, and/or Technology) in the Roy G. Perry College of Engineering.

College of Engineering (CoE) Textbook Policy:

Students MUST acquire the required textbook that is listed on the course syllabus for this course. The textbook must be acquired by the 10th class day. Students are not allowed to share textbooks with students who are currently registered in the same class. Failure to acquire (or show proof of purchase) the required textbook by the 10th class day will result in the student being administratively dropped from the course. The University will assess financial obligations for the course to the student as with any other dropped class according to the fee schedule as well as your financial aid may be affected.

If you are not financially able to purchase a required textbook for an engineering course prior to the 10th class day, you may apply to the College of Engineering Textbook Fund for a textbook voucher. The voucher can only be used at the Campus Bookstore. Additional information about the College of Engineering Textbook Policy and the CoE Textbook Fund may be found at <http://www.pvamu.edu/engineering/>. The student may need to contact the Director of Engineering Student Services in the CoE Dean's office (350 SR Collins).

Student Learning Outcomes:

	Upon successful completion of this course, students will be able to (bold letters in brackets correspond to ABET Criterion 3 measured in the course):	Program Learning Outcome # Alignment	Core Curriculum Outcome Alignment
1	Safely conduct laboratory tests on materials commonly used in civil engineering projects.	6	
2	Interpret the results of the laboratory tests to determine the suitability of the material for a project.	6	
3	Design, mix and test a batch of Portland cement concrete to meet given specifications.	6	
4	Write concise and coherent laboratory reports.	6	
5	Communicate to present the reports by giving power point presentation	6	

Table: Outcome Measures

Course	CVEG Objectives				ABET Criterion 3						
	1	2	3	4	1	2	3	4	5	6	7
CVEG 3100										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**.*

Major Course Requirements

TOPICS COVERED

1. Laboratory safety aspect
2. Laboratory procedure for standard tests on steel
3. Coarse aggregate & fine aggregate
4. Cement manufacturing & ingredients of cement
5. Various tests on cements
6. Concrete & Mix Design of Concrete
7. Standard Tests of Concrete

Laboratory/Field Work:

1. Charpy Impact test
2. Tensile Test of Steel
3. Torsion test on Steel
4. Hardness Test of Steel
5. Gradation, Specific Gravity, water absorption of aggregates
6. Normal Consistency, initial and final setting time of cement
7. 7 days, 14 days, 21 days and 28 days compression test on concrete cylinders
8. Slump Test.

Grading Matrix

Item	Value (Points or Percentages)
Quizzes	10%
Lab Reports & Drawing	20%
HMWK assignments	20%
Tests (2 tests @15% each)	30%
Final Exam	20%
Total:	100 %

Grade Determination:

- A = 90-100%
B = 80-89%
C = 70-79%
D = 60-69%
F = 00-59%

TaskStream

TaskStream is a tool that Prairie View A&M University uses for assessment purposes. At least one of your assignments is **REQUIRED** to be submitted as an "artifact," an item of coursework that serves as evidence that course objectives are met. More information will be provided during the semester, but for general information, you can visit **TaskStream** via the link in eCourses.

Course Procedures or Additional Instructor Policies

1. There will be three (3) exams, homework and laboratory exercises
2. Homework and laboratory reports will be collected and graded. There will be 6 to 10 assignments during the course of the semester. **Late homework may NOT be graded.**
3. It is the student's responsibility to contact the instructor within ONE week to make up any assignments

required **during any period** of an excused absence from class.

4. Dishonesty will result in a grade of F (ZERO) for the assignment or test involved (see University Policy below).
5. Standard **8 1/2" X 11"** paper should be used for homework [Engineering paper is recommended].
Work submitted by students should be done neatly, in pencil, and on one side of the sheet only.

Formatting Documents:

The format for submitting specific homework assignments and lab reports will be discussed when they are assigned. At a minimum, the response should be word processed, spell checked, written with appropriate grammar, and presented in an easy to follow format. For assignments calling for a specific number of pages, a page is approximately 400 words (based on the word processing program's word count function). Each assignment should contain the student's first and last name, course number and name, and date submitted. Multiple pages should be stapled together.

Exam Policy

- Quizzes will at the start of every class during the first 10 minutes of the class.
- No makeup quizzes or mid-term tests will be given.
- If you miss a quiz or the mid-term test due to an unexcused absence you will receive zero credit for that quiz or test. If you have an excused absence and miss a quiz, your lab/exercise/quiz average will be based on the quizzes taken throughout the semester.
- If you miss the mid-term test due to an excused absence, the final exam will count for both the mid-term test and final exam.
- Failure to take the final examination will result in an automatic grade of "F" for the course.
- Students should bring a stand alone calculator (cell phone calculators are not permitted) to all class meetings. Sharing of calculators will not be permitted.
- Once a quiz or test/exam begins, students are not permitted to leave the class room until they are finished with the quiz/test/exam.

Laboratory Procedures

- Students must download and bring a hard copy of the appropriate testing procedures for each laboratory exercise. The majority of the procedures are available at no charge from the Texas Department of Transportation website. See the reference section below for the web address. Procedures not available on the TxDOT website will be provided by the instructor.
- Students who miss a laboratory exercise due to an excused absence will receive a 15% deduction on the corresponding laboratory report. Students who miss a laboratory exercise due to an unexcused absence will receive a 50% deduction on the corresponding laboratory report.
- Students must sign the laboratory safety briefing verification form before they will be allowed to participate in laboratory exercises.
- Students must wear long pants and closed toed shoes during lab activities. Students who do not wear appropriate clothing will not be admitted to lab and will have points deducted from the corresponding lab report corresponding to an unexcused absence.

Semester Calendar

16 WEEK CALENDAR (TENTATIVE AND SUBJECT TO CHANGE)

Items listed within the Reading section of the calendar should be read prior to coming to class. Material contained in the reading section is quiz-able material.

Assignments are due at the beginning of class. Multiple pages should be stapled together.

Week 1

Topic	Introduction, Lab Tour, Safety Briefing
Reading	Lab Safety Handout, Material Handout, Course Pre-Requisites
Lab Testing	None
Assignment Due	None

Week 2

Topic	Outlining the syllabus & Lab visit
Reading	None

Lab Testing	None
Assignment Due	None
Week 3	
Topic	Course Outline/Calendar, Lab Safety Rules, Lab Reporting Format, & Test Data Analysis
Reading:	Lab Safety Rules, General Lab Test Data Analysis & Reporting
Lab Testing	None
Assignment Due	Sign & Hand-In Lab Safety Briefing Form
Week 4	
Topic	Steel Lecture, Charpy Impact Test, Brinell Hardness Test
Reading	Steel Handout, Charpy Test Procedure, Brinell Test Procedure
Lab Testing	Perform the Charpy & Brinell Tests
Assignment Due	None
Week 5	
Topic	Torsion Test, Tension Test
Reading	Torsion Test Procedure, Tension Test Procedure
Lab Testing	Perform the Tension & Torsion Tests
Assignments Due	Lab Report# 01 - Charpy and Brinell Lab Tests (10 Points)
Week 6	
Topic:	Aggregate/Concrete Lecture (including Mix-Design Example)
Reading:	Aggregate/Concrete Handout
Lab Testing	None
Assignment Due	Lab Report# 02 - Tension and Torsion Lab Tests (10 Points)
Week 7	
Topic	Concrete Aggregate Tests: Sieve, Moisture, and Bulk Unit Weight
Reading:	Sieve Analysis Test Procedure, Moisture Content Test Procedure, Bulk Unit Weight Test Procedure
Lab Testing	Mix-Design, Sieving, Moisture, & Bulk Unit Weight
Assignment Due	None
Week 8:	
Topic	, Mid-Term Review , Concrete Batching, Wet Concrete Testing
Reading:	Concrete mixing and curing handout, slump test procedure
Lab Testing	Batch Concrete, Wet Concrete Tests – Slump & Air Content
Assignment Due	Lab Report# 03 - Mix-Design, Sieving, Moisture, & Bulk Unit Weight (10 Points)
Week 9	
Topic	Presentations & Mid-Term (Communications – ABET Item# G)
Reading:	Lab Reports (1, 2, & 3) & All Materials Covered Up to this Point
Lab Testing	None
Assignment Due	None
Week 10	
Topic	Mid-Term Test Review, Initial & Final setting time of cement, Concrete Compression Test
Reading:	Concrete Compression Test Procedures
Lab Testing	Concrete Compression Test (14 Days)
Assignment Due	Lab Report# 04 – Concrete Slump & Air Content (10 Points)
Week 11	
Topic	Concrete Compression Test
Reading:	Concrete Compression Test Procedures
Lab Testing	Concrete Compression Test (21 Days)
Assignment Due	None
Week 12	
Topic	Quiz#08, Concrete Compression Test
Reading:	Concrete Compression Test Procedures

Lab Testing	Concrete Compression Test (28 Days)
Assignment Due	None

Week 13

Topic	Specifications & Testing Protocol Development
Reading:	Specification Handout
Lab Testing	Mix-Design Demo#02
Assignment Due	Lab Report# 05 – Concrete Compression Tests

Week 14

Topic	Test Specifications, General Lab Related Topics
Reading:	Specification Handout, General Course Materials
Lab Testing	Mix-Design Demo#03
Assignment Due	HMWK# 02 - Concrete

Week 15

Topic	General Class Review
Reading	All Materials covered in Class
Lab Testing	None
Assignment Due	None

Week 16

Topic	Final Exam
Reading:	All Materials covered in Class during the Whole Semester
Lab Testing	None
Assignment Due	None

Mapping of Program Educational Objectives onto Student Outcomes

PEO	Program Educational Objectives	CE Student Outcomes						
	<i>Graduates from the Civil Engineering program will:</i>	[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).

The Assessment Process

Student Learning outcomes are measured using both **direct** and **indirect** measurements. Direct measurement are derived from either designated homework, tests, lab reports project reports or other assignments. Indirect measurement are drawn from end-of-semester Student Opinion Surveys (SOS) and any surveys completed by graduating Seniors. The above listed Student Learning Outcomes (Program Outcomes) are measured and evaluated in specified cycles and an Assessment Report is prepared annually for the purposes of continuously improving the Program's learning outcomes.

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
leave the classroom to visit the rest room (your exam terminates).

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.

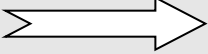
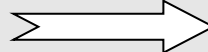
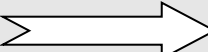
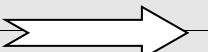
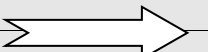
5. Overall Trend over last three assessment periods

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

END OF SEMESTER COURSE OUTCOME ASSESSMENT REPORT
CVEG 3100- STEEL & CONCRETE LAB
FALL 2021

Report Prepared by: Dr. Abdul M Choudhury

Report Date: Dec 19, 2021

Semester	Analysis Type	Number of Students	Outcome 6 An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions			
			Expected Class Average/	Expected Percent of students at or above average	Class Average	% Students meeting Expected Average
Fall 2021	Direct	19	70	70	77.78	89.47
Fall 2020	Direct	14	70	70	88.9	100
Spring 2020	Direct	8	70	70	92	100
Fall 2019	Direct	21	70	70	88.35	85.7
Implementation Summary	Items implemented from previous report or after meeting previous instructor 	Students were encouraged to participate in their group writing of reports rather than depending only on one or two individual. They were encouraged to use more references from the available web resource while writing a lab report.. They were encouraged to have a good review of Physics and statistics.				
Perceived Problems	Perceived problems are directly related to the PC and the sub items under them 	In general, about 100% of the class was able to satisfy this outcome. Most of the equipment used for testing cement and concrete were not in good condition. So these can be maintained properly or repaired with the help of authorized personnel.				
Plans for Addressing Problems	Plans for address specific measures to address PC and their sub areas 	Students should be encouraged to participate equally among a group for writing reports. They should be instructed to use more references including the latest. The results obtained should be compared with the value recommended by the relevant code. A final comment about the result is needed after comparing with the standard coded value. Figured and table should be numbered in a systematic pattern.				
Overall Trend over Periods	Ascertain if there were improvements over previous semesters 	The enrolments of reduced than the previous year. However there was a better performance in term of outcomes. The trend of improvement continued like previous years				
Were Expectations Met?		Yes				

**Grade sheet showing outcomes CVEG 3100 Steel & Concrete Lab
Fall 2021**

Student Roster no	Outcome 6		Average % of outcome 6
	Lab Report 1	Lab report 2	
1	95	98	96.5
2	72	75	73.5
3	91	66	78.5
4		73	36.5
5	79	76	77.5
6	79	70	74.5
7	87	80	83.5
8	81	87	84
9	87	71	79
10	78	88	83
11	86	89	87.5
12	86		43
13	91	88	89.5
14	83	84	83.5
15	86	65	75.5
16	93	83	88
17	85	85	85
18	84	85	84.5
19	81	69	75
Maximum Marks	100	100	100
% Average	84.66	79.55	77.78

**OUTCOME SPECIFIC ASSIGNMENTS
USED TO ASSESS OUTCOMES**

ASSIGNMENTS FOR OUTCOME “6”

An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

(As it relates to Steel & Concrete lab)

OUTCOMES SPECIFIC ASSIGNMENT COVER SHEET

CVEG 3100-Steel & Concrete Lab
Instructor: Dr. Abdul M Choudhury

Title of Assignment

Lab Report # 1

Outcome Measured Using this Assignment

Outcome 6

An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

Brief justification of the suitability of this assignment for the outcome

The questions on this section of the Lab Experiment show the students ability to design and conduct experiments, as well as to analyze and interpret data

CIVIL AND ENVIRONMENTAL ENGINEERING DEPARTMENT
CVEG 3100- STEEL & CONCRETE LAB
COURSE ASSIGNMENT GRADING
AND OUTCOME ASSESSMENT SHEET

ASSIGNMENT TITLE: Lab Report # 1

DUE DATE: 10/04/2021 DATE SUBMITTED: 10/04/2021
 Name of Student: Allyssa Reynolds

Title of Assignment: ____Sieve Analysis of Aggregates____

Competency Area	Max for this Assignment	Student's Score
(6) An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions <i>Laboratory experiments covering designing and conducting experiments have been included in part. The laboratory data has been plotted graphically and necessary statistical calculation was carried out to arrive at the conclusion. Another main emphasize was also given on writing the laboratory reports properly.</i>	100	91
TOTAL	100	91

Prairie View A&M University



Civil Engineering Department

CVEG 3100 (P81): Concrete & Steel Laboratory

Fall 2021

Group No. 2

Laboratory Report No. 1

Laboratory Name:

"Sieve Analysis"

Conducted on

September 27, 2021

Submitted by

Allyssa Reynolds

Due

October 4, 2021

To

Dr. Choudhury

91
/ 100

Abstract

This experiment aims to understand the concept of using the sieve analysis test to understand the properties of coarse and fine aggregates, including their gradation. A very prominent hard material used within Civil Engineering is concrete, as concrete can be used to construct roads, bridges, and structures.

Concrete mainly consists of cement, aggregates, and water. To understand the strength of concrete, engineers must understand how aggregates are used, thus the importance of using the sieve analysis.

Table of Contents

Page 2: Abstract, Table of Contents, and Introduction

Page 3: Test Objectives and Description of Equipment

Page 4: Materials and Test Condition, Procedure

Page 5: Data Analysis Methods

Page 6: Figures and Calculations

Page 8: Test Results & Analysis, Discussion of Results, and Summary

Page 9: References

*index page
with page
number*

Introduction

This exercise aims to determine the gradation of materials, including the fineness modulus, by properly conducting the sieve analysis test.

The sieve analysis is used to test the gradation of fine and coarse materials. Within this process, sieves of various sizes are used to separate aggregate sizes. Particularly, engineers need to understand if the material is coarse or fine. To understand this difference, fine materials pass through a sieve size of 4.75 mm, while coarse materials do not pass this sieve. ✓

After the engineer can determine which material is coarse or fine, appropriate tests can be conducted to determine various characteristics of the materials, such as the bucket immersion test and pycnometer test. The first test is used for coarse materials, while the latter is used for fine materials.

*- 2 significance & blending
FM & Blending*

Test objectives

The main objective is to determine the fineness modulus of material by conducting the sieve analysis test.

Description of Equipment

Sieves and Aggregates: Used to separate various aggregate sizes.

Measuring Scale: Used to find the mass of material.

Sifter Testing Machine: Used to separate aggregate within their appropriate sieves.

Materials and Test conditions

Sieve

Sifter Testing Machine

Measuring Scale

Aggregate of Various Sizes

Empty Bowl

Procedure: Sieve Analysis Test

- I. Obtain appropriate sieve sizes, and weigh each **empty** sieve. Record data properly.
 - A. Sieve sizes used include 19mm, 9.5mm, 4.75mm, 2.3mm, 1.19mm, 0.600mm, 0.300mm, 0.150mm, 0.075mm, and the pan.
- II. Weigh empty bowl. Record weight properly.
- III. Place 2 kilograms of the aggregate of various materials within the empty bowl.
 - A. The weight of the bowl with aggregate should be the weight of the bowl + 2 kilograms.
- IV. Place appropriate aggregate into sieves.
 - A. Sieves should be increasing order of sieve size, with 9.5mm being the sieve size at the top and 0.075mm being the sieve size directly above the pan.
- V. Place sieves in the sifter machine.
 - A. Let the machine run for 4 minutes.
- VI. After the sifter machine is done, take sieves out without losing any aggregate.
- VII. Weigh each sieve with aggregate. Record the weight appropriately.
- VIII. Empty materials in respective bins.

No experimental safety issues were present as no hazardous materials were used. Standard safety protocol, such as wearing appropriate personal protective equipment, including closed-toe shoes and pants, was followed throughout experiments.

Data Analysis Methods

(Eq. 1) Amount Aggregate Retained: *Sieve w/Aggregate – Empty Sieve Size*

(Eq. 2) Cumulative Retained Aggregate:

Summation of Each Aggregate Size per Respective Sieve

(Eq. 3) Cumulative Percent Retained:

(Cumulative Retained $\cdot$ 100) $\div$ Total Amount of Aggregate

(Eq. 4) Percent Passing: $100 - \text{Cumulative Percent Retained}$

(Eq. 5) Fineness Modulus: $\frac{\Sigma \text{Cumulative Percent Retained}}{100}$

Max Aggregate Size: 19mm

Nominal Aggregate Size: 19mm

9.5 mm - 150 μ

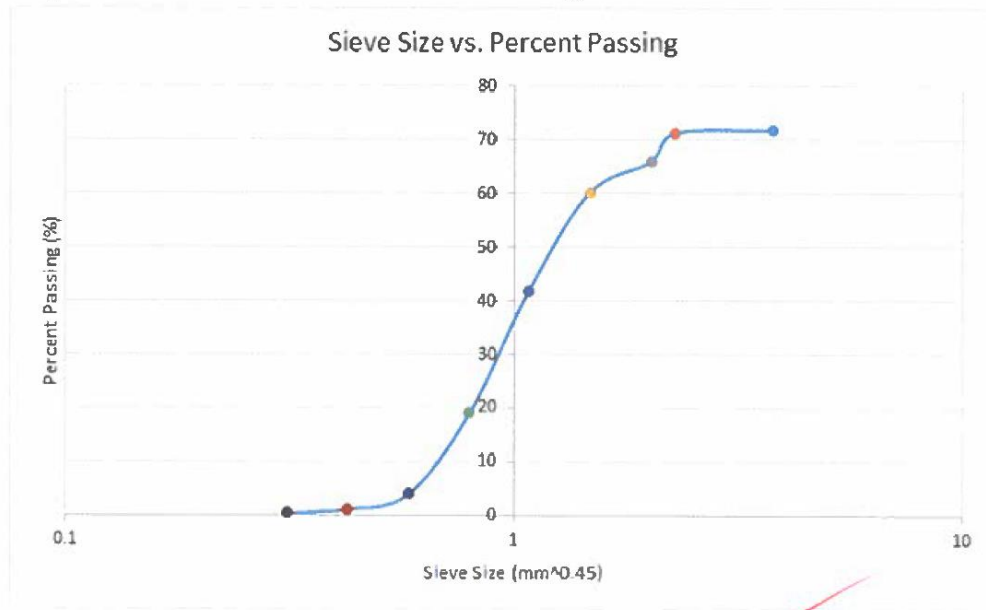
List of Figures/Calculations

Sieve Analysis Table 1.0

Sieve Size (mm)	Amount of Aggregate Retained (g)	Cumulative Retained Aggregate (g)	Cumulative Percent Retained (%)	Percent Passing (%)
19	450.5	450.5	28.165	71.84
6.3	25	475.5	28.728	71.27
4.75	70	545.5	34.10	65.9
2.36	92.5	638	39.887	60.11
1.18	293.5	931.5	58.24	41.76
0.600	363.5	1295	80.96	19.04
0.300	240.5	1535.5	95.99	4.01
0.150	44.5	1580	98.78	1.22
0.075	11	1591	99.47	0.53
Pan	8.5	0	100	0
Total	1599.5	564.32		

Fineness Modulus: $\frac{34.10+39.9+58.24+80.96+95.99+98.78}{100} = \frac{407.97}{100} = 4.0797$

Graph 1.0: Reflects the Sieve Size vs. Percent Passing



Test Results and Analysis

It was found that our fineness modulus was 4.0797. We found this number by finding the sum of the cumulative percent retained and dividing the sum by 100. Sieves accounted for within this calculation include sizes 4.75mm, 2.36mm, 1.18mm, 0.6mm, 0.3mm, and 0.015mm.

To find the cumulative percent retained, we needed to find the amount of aggregate retained first. In doing so, equation one was utilized by subtracting the weight of the aggregate in the sieve and subtracting that value by the empty sieve. Next, equation two was used to find the cumulative retained aggregate by adding each value of the recorded amount retained. Lastly, equation three was utilized to find the percent cumulative retained by multiplying the cumulative retained value by 100 and dividing that value by the total amount of aggregate obtained.

Discussion and Interpretation of the Results & Findings

All objectives of the experiment have been met, as the fineness modulus of the aggregates was found. Additionally, the Semi Log Graph of Percent Passing vs. Sieve Size was able to be obtained.

Summary

During this experiment, we were tasked with finding the fineness modulus of given fine and coarse aggregates. After conducting the sieve analysis test, we were able to determine the fineness modulus successfully. We were also able to find other aggregate characteristics, including the percent passing of the materials and the cumulative percent passing of the aggregate.

References

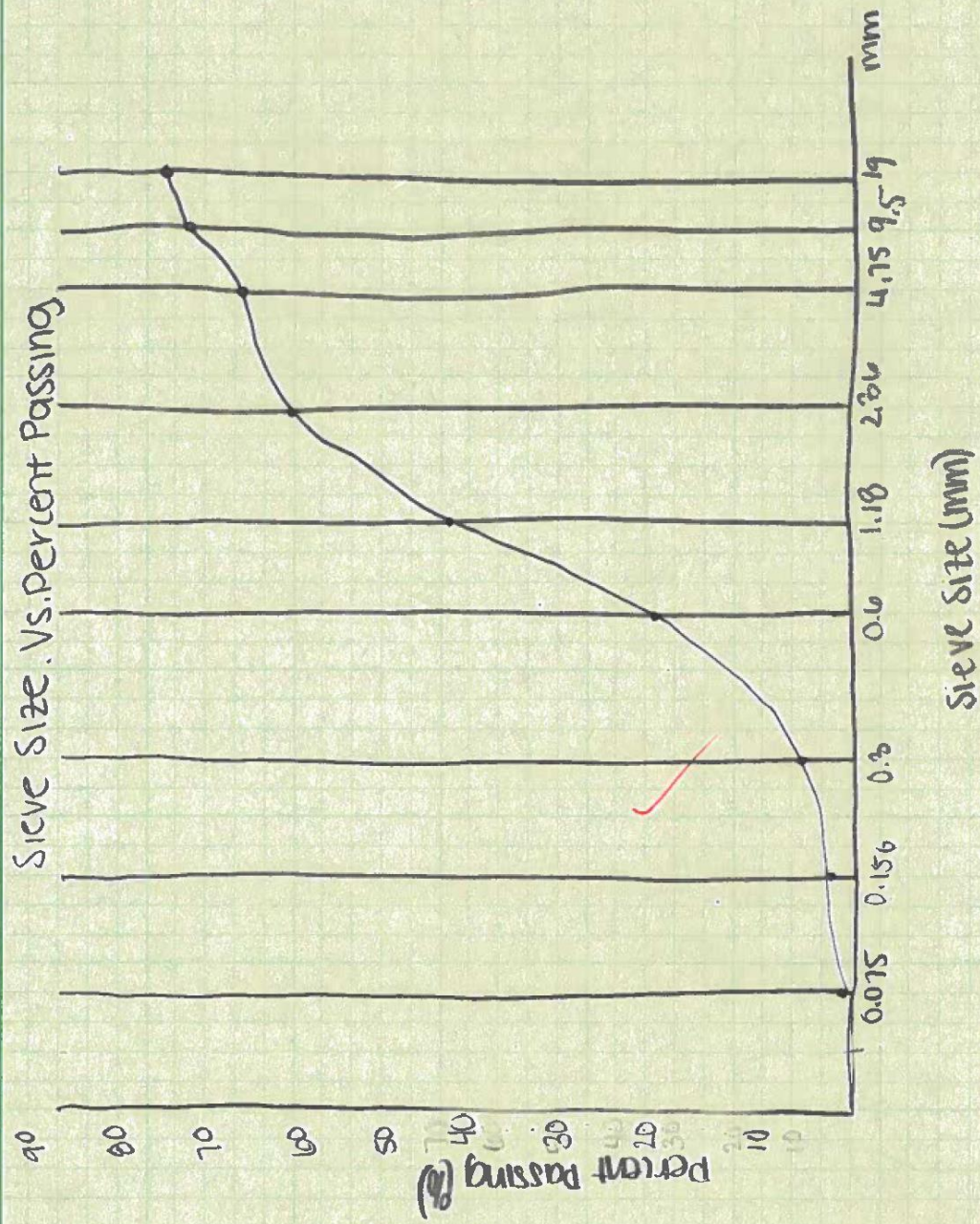
Mamlouk, Michael S, and John P. Zaniewski. *Materials for Civil and Construction Engineers*. , 2017. Digital.

Mishra, Gopal. "Grain Size Analysis of Fine Aggregates - Particle Size Distribution Test." *The Constructor*, 10 Nov. 2017, theconstructor.org/practical-guide/grain-size-analysis/2261/.

Sample Container for Coarse Aggregates.
humboldtinf.com/sample-container-coarse-aggregates.html.

W.S. Tyler Sound Enclosure for Ro-Tap II Sieve Shaker, 34"W x 31"H x 33" D from Cole-Parmer.
coileparmer.com/i/w-s-tyler-sound-enclosure-for-ro-tap-ii-sieve-shaker-34-w-x-31-h-x-33-d/5998655?PubID=UX&persist=true&ip=no&gclid=Cj0KCQjwwNWKBhDAARIsAJ8HkheSRQb7In6Kjde5L-YQYzSHNPXmKCD5oTRAIH_loMRChMN2YZRye8aAgZwEALw_wcB.

ASTM code no ?



OUTCOMES SPECIFIC ASSIGNMENT COVER SHEET

CVEG 3100-Steel & Concrete Lab
Instructor: Dr. Abdul M Choudhury

Title of Assignment

Lab Report # 2

Outcome Measured Using this Assignment

Outcome 6

An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions

Brief justification of the suitability of this assignment for the outcome

The questions on this section of the Lab Experiment show the students ability to design and conduct experiments, as well as to analyze and interpret data

**CIVIL AND ENVIRONMENTAL ENGINEERING DEPARTMENT
CVEG 3100- STEEL & CONCRETE LAB
COURSE ASSIGNMENT GRADING
AND OUTCOME ASSESSMENT SHEET**

ASSIGNMENT TITLE: Lab Report #2

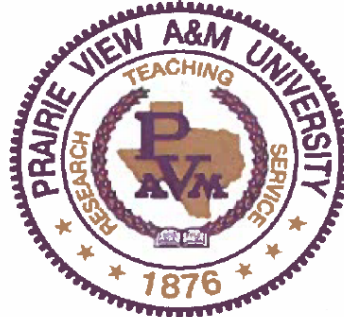
DUE DATE: 10/04/2021_____ DATE SUBMITTED: 10/04/2021_____

Name of Student: Maalvika Aggarwal

Title of Assignment:___Specific gravity and absorption of aggregates

Competency Area	Max for this Assignment	Student's Score
(6) An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions <i>Laboratory experiments covering designing and conducting experiments have been included in part. The laboratory data has been plotted graphically and necessary statistical calculation was carried out to arrive at the conclusion. Another main emphasize was also given on writing the laboratory reports properly.</i>	100	98
TOTAL	100	98

Prairie View A&M University
Roy G. Perry College of Engineering
Civil & Environmental Engineering Department



CVEG 3100 P81 – Concrete and Steel Laboratory
Fall 2021

Maalvika Aggarwal

Lab 2: Specific gravity and Absorption of Fine Aggregate
and Coarse Aggregate

98
100

Due Date: October 4th, 2021

Submitted to: Dr. Choudhury

TABLE OF CONTENTS:

1. Objective	pg. 2
2. Abstract	pg. 2
3. Introduction to the theory	
I. Specific gravity	pg. 2
II. Bucket-Immersion test	pg. 3
4. Data analysis equations	pg. 3
5. Equipment and Analysis tools	pg. 4
6. Experimental Safety Issue	pg. 4
7. Description of Procedure	pg. 4
8. Data and Test Results	
I. Table 1: Data collected from the Pycnometer test	pg. 6
II. Table 2: Data collected from the Bucket-Immersion test	pg. 7
III. Table 3: Data collected from the Absorption test	pg. 7
9. Calculations	
I. Table 4: Calculations for the Pycnometer test	pg. 8
II. Table 5: Calculations for the Bucket-Immersion test	pg. 9
III. Table 6: Calculations for the Absorption test	pg. 10
10. Discussion and Analysis	
I. Table 7: Reflects the Test results for all the Three tests	pg. 11
11. Conclusion	pg. 13
12. Appendix	pg. 14
13. References	pg. 15

EQUIPMENT AND ANALYSIS TOOLS:

- Fine Aggregate
- Coarse Aggregate
- Water
- Pycnometer
- Measuring scale- to measure the mass of materials.
- A scoop- to pour the aggregate.
- Metal tins
- A steel bucket- used for bucket-immersion test.
- A large plastic bucket- used for bucket-immersion test.
- Spring balance- used for bucket-immersion test. ✓

EXPERIMENTAL SAFETY ISSUE:

- No hazardous materials or chemicals used in the experiment.
- Appropriate clothing should be worn, i.e., closed toe shoes, pants, and blouses. Standard laboratory protocols must be followed.
- Aggregates may contain dust and bacteria/germs, which can be harmful to one's health. Wearing of masks and gloves is recommended. ✓

DESCRIPTION OF PROCEDURE:

PYCNOMETER TEST-FOR FINE AGGREGATE

1. Take an empty pycnometer and measure its mass, using a measuring scale. Record the mass.

2. Add water to the pycnometer, roughly to the 500-ml mark, and measure the mass. Record the mass of the pycnometer with water.
3. Discard the water and add an amount of fine aggregate (sand) to the pycnometer, roughly to the 200-ml mark. Measure the mass of pycnometer with sand and record it.
4. Again, add water to the pycnometer with the aggregate and measure the mass of the pycnometer with water and aggregate, and record it. Repeat the process two more times.
5. Safely discard all the aggregate as per the instructions and clean up.

ABSORPTION TEST-FOR FINE AGGREGATE

1. Take an empty metal tin and measure its mass, using a measuring scale. Record the result.
2. Using a scoop, pour some amount of coarse aggregate and add it to the metal tin.
3. Record the mass of the metal tin with aggregate, using a measuring scale.
4. Add some amount of water to the aggregate in the metal tin and let it sit for a period of twenty-four hours, during which the absorption will occur.
5. After 24-hours, measure the mass of the metal tin with the wet aggregate using a measuring scale and record the result. Repeat the process twice more, to get 3 trials.
6. Safely discard all the aggregate and clean-up.

BUCKET-IMMERSION TEST-FOR COARSE AGGREGATE

1. Take an empty steel-mesh bucket and place it on a measuring scale. Record its empty mass.
 2. Manually take some amount of coarse aggregate and add it to the steel-mesh bucket. Record the mass of the bucket with aggregate.
- 

3. Take another big plastic bucket filled with water.
4. Immerse the steel-mesh bucket with aggregate into the plastic bucket, with the help of a spring balance suspended upon the handle of the steel-mesh bucket. Make sure the steel bucket does not touch the bottom of the plastic bucket.
5. Record the mass of the steel-mesh bucket from the digital spring balance in pounds.
6. Repeat the process three times, in total.
7. Safely discard all the aggregate and clean-up.

DATA AND TEST RESULTS:

Table 1: Data collected from the Pycnometer test for Fine Aggregate:

TRIAL #	Weight of empty pycnometer (g)	Weight of pycnometer with water (g)	Weight of pycnometer with fine aggregate (g)	Weight of pycnometer with fine aggregate and water (g)
1	167.88	662.24	474.68	850.00
2	174.55	665.29	461.58	835.50
3	169.31	662.91	511.94	870.50

2 Add some practical figures ✓

Table 2: Data collected from the Bucket-Immersion test for Coarse Aggregate:

TRIAL #	Weight of empty steel bucket (Kg)	Weight of steel bucket with coarse aggregate in Air (Kg)	Submerged weight of steel bucket with coarse aggregate (Lb)	Submerged weight of steel bucket with coarse aggregate (Kg) (Weight in lb*0.453)
1	1.974	2.4195	4.60	2.0838
2	1.996	2.4435	4.70	2.1291
3	1.992	2.4405	4.70	2.1291

Table 3: Data collected from Absorption test for Fine Aggregate:

TRIAL #	Weight of empty metal tin (g)	Weight of metal tin and fine aggregate (g)	Weight of metal tin and wet aggregate (g)
1	25.50	70.20	91.50
2	24.90	68.40	89.30
3	25.40	62.50	82.00

CALCULATIONS:

Table 4: Calculations for the Pycnometer test for Fine Aggregate:

Trial #	Weight of pycnometer (g)	Weight of pycnometer with water (g) <u>B</u>	Weight of pycnometer with fine aggregate (g)	Dry weight of aggregate (g) (Weight of pycnometer and aggregate – weight of pycnometer) <u>A</u>	Weight of pycnometer with fine aggregate and water (g) <u>C</u>
1	167.88	662.24	474.68	306.8	850.00
2	174.55	665.29	461.58	287.03	835.50
3	169.31	662.91	511.94	342.63	870.50

$$\text{Specific Gravity for Fine Aggregate (SG)} = \frac{A}{B + A - C}$$

$$SG \text{ for trial 1} = \frac{306.8}{662.24 + 306.8 - 850} = 2.577$$

$$SG \text{ for trial 2} = \frac{287.03}{665.29 + 287.03 - 835.5} = 2.457$$

$$SG \text{ for trial 3} = \frac{342.63}{662.91 + 342.63 - 870.5} = 2.537$$

Average Specific gravity for fine aggregate (sand) = 2.524

Standard Value of Specific Gravity of Sand = 2.65

Percentage of Error = $\frac{2.524 - 2.65}{2.65} \times 100 = 4.76\%$

Range

Table 5: Calculations for Bucket-Immersion test for Coarse Aggregate:

Trial #	Weight of empty steel bucket (Kg)	Weight of steel bucket with coarse aggregate in air (Kg)	Dry weight of coarse aggregate in air (Kg) (Weight of bucket with aggregate – empty weight of bucket) <u>A</u>	Submerged weight of steel bucket with coarse aggregate (Kg)	Weight of coarse aggregate in water (Kg) (Submerged weight of bucket with aggregate – empty weight of bucket) <u>B</u>
1	1.974	2.4195	0.445	2.0838	0.109
2	1.996	2.4435	0.447	2.1291	0.133
3	1.992	2.4405	0.448	2.1291	0.137

Specific Gravity for Coarse Aggregate (SG_c) = $\frac{A}{A-B}$

$$SG \text{ for trial 1} = \frac{0.445}{0.445 - 0.109} = 1.327$$

$$SG \text{ for trial 2} = \frac{0.447}{0.447 - 0.133} = 1.423$$

$$SG \text{ for trial 3} = \frac{0.448}{0.448 - 0.137} = 1.440$$

Average Specific gravity for coarse aggregate = 1.396 ?

Standard Value of Specific Gravity of Coarse Aggregate = 2.6

$$\text{Percentage of Error} = \frac{1.440 - 2.6}{2.6} * 100 = 46.2\%$$

Range

Table 6: Calculations for Absorption test for Fine Aggregate:

Trial #	Weight of empty metal tin (g)	Weight of metal tin and fine aggregate (g)	Dry weight of Fine Aggregate (g) (Weight of metal tin and fine aggregate - Weight of empty metal tin) <u>A</u>	Weight of metal tin and wet aggregate (g)	Weight of Wet Aggregate (g) (Weight of metal tin and wet aggregate - Weight of empty metal tin) <u>C</u>
1	25.50	70.20	44.7	91.50	66
2	24.90	68.40	43.5	89.30	64.4
3	25.40	62.50	37.1	82.00	56.6

$$\text{Absorption for Fine Aggregate} = \frac{C-A}{A} \times 100$$

$$\text{Absorption for trial 1} = \frac{66 - 44.7}{44.7} \times 100 = 47.651\%$$

$$\text{Absorption for trial 2} = \frac{64.4 - 43.5}{43.5} \times 100 = 48.046\%$$

$$\text{Absorption for trial 3} = \frac{56.6 - 37.1}{37.1} \times 100 = 52.561\%$$

Average Absorption for fine aggregate = 49.419%

DISCUSSION AND ANALYSIS:

Table 7: Reflects the Test results for all the Three tests:

PROPERTY	Average Specific Gravity of Fine Aggregate	Average Specific Gravity of Coarse Aggregate	Average Absorption of Fine Aggregate
	2.524	1.396	49.419 %

Discussion:

As it can be seen, the average specific gravity for the fine aggregate was found to be 2.524, through the pycnometer test. The standard value of specific gravity for sand is 2.65. Thus, the experiment had a percent error of 4.76%. This error is not huge and is within the parameters. Therefore, the result shall be accepted.

The specific gravity of coarse aggregate was calculated to be 1.396. This was done through a technique of bucket-immersion test. Since, the standard value of specific gravity for coarse aggregate is 2.6, this gave a percent error of 46.2%. This error is considerably large and does not fall within the parameters to be accepted. This means that the experiment had major possible errors.

Absorption of fine aggregate was found to be 49.419%, through a test of absorption performed with a period of twenty-four hours. The standard value of absorption falls within the range of 2.5- 3%. Since, the calculated absorption exceeds that threshold, it cannot be accepted, and it shows that the experiment performed had quite a lot of errors.



CONCLUSION:

It is evident that both coarse and fine aggregate have separate methods/tests to determine their specific gravity and absorption. The experiment started with the pycnometer test for finding the specific gravity of fine aggregate. Further, an absorption test was performed to calculate the absorption (percentage) of fine aggregate. Lastly, the experiment was concluded with a bucket-immersion test to determine the specific gravity of coarse aggregate. After recording all the data, calculations were performed to determine the specific gravity for both coarse and fine aggregate and absorption for the latter. An average specific gravity of 2.524 was found for fine aggregate and 1.396 for coarse aggregate. The absorption came out to be 49.419%.

In order to maintain accuracy and precision, there were a total of 3 trials performed in each test. An average of all three was taken as the final result. The specific gravity of fine aggregate had a percent error of 4.76%, which is acceptable. However, unfortunately, the other two tests performed were for the specific gravity of coarse aggregate, which had a percent error of 46.2%, and absorption of fine aggregate that was way above the acceptable threshold. These results cannot be accepted as they show a high percentage of error in the experiment.

There can be many possible sources of error in the experiment. Human error is the most common error as there was a lot of aggregate/water that gets lost in the transferring phase of one equipment to another. Other errors could be misinterpreting the measuring scale or spring balance, error while recording. Also, it is possible that since the test was performed first time by inexperienced students, it could have affected the accuracy of results.

Overall, taking into account all the test results, the experiment was somewhat successful and further strengthened the knowledge of classroom theory.

APPENDIX:

Absorption- The increase in mass of aggregate due to water penetrating into the pores of the particles, during a prescribed period of time, but not including water adhering to the outside surface of the particles, expressed as percentage of the dry mass.

Specific gravity- Also known as relative density, it is the ratio of the density of a material to the density of water at a stated temperature. It is unitless.

Archimedes' principle- It states that the buoyant force on an object equals the weight of the fluid it displaces. Specific gravity is the ratio of the density of an object to a fluid, usually water.

Coarse aggregates: Aggregate particles that are retained on a 4.75 mm sieve, i.e., Sieve No. 4.

Fine aggregates: Aggregate particles that pass a 4.75 mm sieve, i.e., Sieve No. 4.



REFERENCES

- OpenStax. "Archimedes' Principle." *Lumen*,
[https://courses.lumenlearning.com/physics/chapter/11-7-archimedes-principle/#:~:text=Archimedes%20principle%20states%20that%20the,a%20fluid%20\(usually%20water\).](https://courses.lumenlearning.com/physics/chapter/11-7-archimedes-principle/#:~:text=Archimedes%20principle%20states%20that%20the,a%20fluid%20(usually%20water).)
- Siddiquee, Toky. "Toky Siddiquee." *Civil Engineering*, <https://civiltoday.com/civil-engineering-materials/sand/359-specific-gravity-of-sand>.
- "Standard Test Method for Relative Density (Specific Gravity) and Absorption of Fine Aggregate." <https://doi.org/10.1520/c0128-01>.
- Mamlouk, Michael S., and John P. Zaniewski. "Experiment No. 7 Sieve Analysis of Aggregates." *Materials for Civil and Construction Engineers*, 4th ed., Pearson Education Limited, Essex, 2018.