



MOREHOUSE

COLLEGE

**Division of Mathematics and Computational Sciences
Physics & Dual Degree Engineering Program Majors**

HEGR 101 Syllabus

Course	Freshman Engineering Design HEGR 101
Semester	Spring 2022
Location	Dansby Room 115

Instructor Contact Information

Instructor Name	Emmanuel Karikari
Email	Emmanuel.Karikari@morehouse.edu
Phone	(770) 866-0385
Hours of Availability	T, R 10 AM – 11 AM and by appointment via Zoom

HEGR 101

This course provides an introduction to the engineering profession focusing on the nature of engineering problems and their solutions, the roles of experimentation, the computer and communication skills in engineering practice. In addition, the student will be exposed to the fundamental procedures for tackling new, unsolved, open-ended problems; essential details of analyzing, synthesizing and implementing design solutions; and the importance of teamwork in engineering practice. This course consists of a lecture component and a laboratory component.

Required text: **Engineering Your Future, A Comprehensive Approach, by Oakes, Leone, and Potter, Great Lakes Press, 9th Edition.**

Supplementary materials:

1. Engineering Your Future, A Problem-Oriented Approach (2003), by Oakes, Leone, and Gunn, Great Lakes Press, 8th Ed.
2. Engineering Your Future, A Project-Oriented Approach (2004), by Gomez, Oakes, Leone, Great Lakes Press, 7th Ed.

Class Time and Location: M,W,F 1:00 – 1:50 PM; Blackboard Collaborate/In-Person Dansby 115

Grading:	Laboratory	30%
	Homework & Quizzes	30%* Quiz at the end of each class
	Midterm Exam	20%
	Final Exam	20%

90 – 100	A
88 -89.9	A-
86 – 87.9	B+
80 – 85.9	B
78 – 79.9	B-
75 – 77.9	C+
70 – 74.9	C
65 – 69.9	C-
60 – 64.9	D
Below 60	F

Attendance

Class attendance is required of all students at Morehouse College. Each student is allowed as many unexcused absences as credit hours for the course. For example, a student is allowed three unexcused absences for a three-credit hour class. A student is expected to attend all classes and not absent himself without adequate cause. It is the responsibility of the student to make up scheduled work missed because of officially excused class absences.

As some classes will be virtual, a student’s attendance will also be determined by his participation. Bearing this in mind, students are required to attend all synchronous sessions. If a student cannot attend a synchronous session, his professor will detail how his participation will be tracked. Once the student receives the maximum number of absences, the professor has the right to have the student administratively withdrawn from the course. The student will be able to monitor his attendance in Blackboard and Starfish.

Academic Integrity

Morehouse is an academic community. All members of the community are expected to abide by ethical standards both in their conduct and in their exercise of responsibilities toward other members in the community. The College expects students to understand and adhere to basic standards of honesty and academic integrity. These standards include but are not limited to the following:

- In projects and assignments prepared independently, students must never represent the ideas or the language of others as their own.

- Students must not destroy or alter either the work of other students or the educational resources and materials of the College.
- Students must not take unfair advantage of fellow students by representing work completed for one course as original work for another or by deliberately disregarding course rules and regulations.
- Unless directed by the faculty member, students should neither give nor receive assistance in examinations.
- Failure to maintain academic integrity will result in one of the following penalties: failure of the assignment, failure of the course, or possible expulsion. The instructor will determine the seriousness of the offence. The offence will be reported in Starfish and added to the student's academic file.

ADA Academic Accommodations

The College makes reasonable accommodations for all qualified individuals with disabilities. Any student requesting academic accommodations based on his disability is required to register with our Student Counseling & Student Accessibility Services Center (the "Center") by emailing SAS@morehouse.edu every semester. A disability accommodation letter can be obtained from the Center. Though faculty will receive an electronic letter from the Center which describes the kind of accommodations, each student who has been approved for accommodations must set up an appointment with the professor to discuss how the accommodations will be applied in each class. If you have any problems concerning the process or would like to be approved for accommodations, please email SAS@morehouse.edu.

Tutoring

Frederick Douglass Academic Success Center (FDASC) offers peer tutoring which can be accessed through Starfish. Please look for the available tutor for the courses which you are enrolled in the Student Success Network. You may schedule an appointment by clicking on their name.

Brainfuse

In addition, the college is providing 24/7 tutoring through Brainfuse. You can access the link to this service in the Tools section of your Blackboard course.

Morehouse Writing Center

Finally, the Writing Center has available tutors to assist you with any part of the writing process. Please contact them to schedule an appointment at the Writing Center morehouse.mywconline.com. Writing Tutors are available Monday – Friday 9:00 am-4:30 pm.

TENTATIVE COURSE OUTLINE

WEEK	DATE	TOPIC	READING ASSIGNMENT
1	1/12 - 1/14	Introduction /Heritage of Engineering	Chapter 1
2	1/17 - 1/21	Presentation on Case Study 3.1 on 2 Engineers (Leonardo da Vinci and Guttenberg)	Chapter 1
3	1/24 - 1/28	Engineering Functions	Power Point Presentation on Engineering Timelines
4	1/31 - 2/4	Engineering Majors	Chapter 2
5	2/7 - 2/11	Statistical Profile of Engineering Profession.	Chapter 3
6	2/14 - 2/18	Succeeding in the Classroom	Chapter 6
7	2/21 - 2/25	Application of linear and quadratic functions to solve science and engineering problems	
8	2/28 - 3/4	MIDTERM EXAMS [3/2 & 3/4]	
9	3/7 = 3/11	Spring Break (No classes)	
10	3/14 - 3/18	Analytic and Creative Problem-solving skills. Power point presentation	Chapter 7 Presentation on Activity 7.4
11	3/21 - 3/25	Teamwork Skills	Chapter 10
12	3/28 - 4/1	Engineering Design Process	Chapter 15 (Gomez, Oakes, Leone)
13	4/4 - 4/8	Technical Communication	Chapter 5 Activity 7.1, p180 (Gomez, Oakes and Leone)

14	4/11 – 4/15	Ethics and Engineering	Chapter 14
15	4/18 – 4/22	Fundamentals of Engineering Vectors – finding resultant using parallelogram law and rectangular components, applications of dot and vector products of vectors	Chapter 15
16	4/25 – 4/27	Final Exam 1 (4/25) Final Exam 2 (4/27)	

Syllabus is not a Contract

A syllabus is not a contract between instructor and student, but rather a guide to course procedures. The instructor reserves the right to amend the syllabus when conflicts, emergencies or circumstances dictate. Students will be duly notified.

JANUARY 2022	
3	College opens; Spring 2022 Final Registration period opens
4-7	Fall 2021 graduate clearance
9	Spring 2022 Final Registration period closes at midnight; Payment Deadline
12	First day of classes; attendance/participation confirmation period begins (students must participate in the first week of classes or will be dropped for non-attendance); Banner self-service reopens for drop and add only (available only to full-time students and financially cleared)
17	Martin Luther King Jr. day observed (Morehouse closed)
18	Last day of add/drop courses without a grade of W; attendance/participation confirmation deadline

JANUARY 2022	
19	Withdrawal period begins
20	Courses dropped for non-attendance/registration canceled

FEBRUARY 2022	
17	Founders Day celebration
25	Last day to make up incompletes (1) Fall 2021
28	Mid-semester evaluations

MARCH 2022	
1-4	Mid-semester evaluations
7-11	Spring break (no classes)
15	Mid-semester grades due
21	Academic advising begins

APRIL 2022	
4	Last day to withdraw from a course; Summer and Fall 2022 Senior Priority Registration Week
11	Summer and Fall 2022 Junior Priority Registration Week
15	Good Friday (Morehouse closed)
18	College reopens; Summer and Fall 2022 Sophomore and Freshmen priority registration week
25	Summer and Fall 2022 registration opens for all students
27	Last day of classes
28-29	Reading period; graduating senior final exams

MAY 2022	
2-6	Final exams
3	Senior grades due by noon
4-13	May 2022 graduate clearance
6	Semester ends
10	Final grades due by noon

MAY 2022	
13-15	Commencement 2022
14	Baccalaureate services
15	Commencement exercise
30	Memorial Day observed (Morehouse closed)
31	Morehouse open; Summer 2022 registration deadline/registration system closed at midnight



Department of Physics & Dual-Degree Engineering
Atlanta, Georgia

HEGR 101L- Freshman Engineering Design Lab

Spring 2022

Catalogue Description

Freshman Engineering Design Lab- Before the arrival of personal computers, beginning engineering students were generally required to learn the mathematical details behind most of the commonly used numerical methods; they were then often required to program many of these methods for large mainframe computers using a general purpose programming language such as Fortran or Pascal. Or they may have written Fortran or Pascal programs that would access a pre-written library of routines for various numerical methods. In either case, the students were required to go through lengthy and tedious procedures. This provided a thorough indoctrination to the use of numerical methods in engineering, but many students would grow impatient and lose interest along the way.

During the 1980s, as personal computers became increasingly more common and dramatically more powerful, spreadsheets emerged as one of the principal types of personal computer applications. Though originally intended for carrying out financial calculations, the newer versions of most commercial spreadsheets include provisions for implementing many of the commonly used numerical methods.

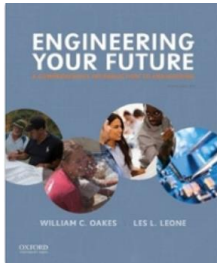
Most spreadsheets now have some numerical methods built directly into their command structure. In particular, modern spreadsheet programs allow you to do the following:

- Store and process data
- Display data graphically
- Analyze data statistically
- Fit algebraic equations through data sets
- Solve single and simultaneous algebraic equations
- Solve optimization problems

Moreover, most other numerical methods can easily be implemented within a spreadsheet simply by making use of the spreadsheet's basic features. Thus,

spreadsheets have made it much easier to apply numerical methods to many of the problems arising in engineering analysis.

Suggested Textbook- Not Required



Engineering Your Future: A Comprehensive Introduction to Engineering

Edition:9th edition

ISBN-13:978-0190279264

Course Objective

This course will be used to reinforce the applications taught in *Engineering 101*. One concern that is not often recognized or adequately addressed is the fact that students using spreadsheets to implement these methods do not understand the underlying principles behind the operations that they are requiring the spreadsheet to perform. This lab will provide this.

Logistics

<i>Time & Location</i>	Monday 4:00PM- 6:50 PM EST & Dansby Lab 115
<i>Instructor</i>	<i>Cherise M. Burton, Ph.D. , PMP</i>
<i>Office Hours</i>	<i>Office hours by appointment and immediately after class</i>
<i>Learning Management System (LMS)</i>	<i>All assignments, labs, notes, and other materials will be posted via Blackboard. It will also be used for exams/quizzes, board post, and team engagement.</i>
<i>Delivery Format</i>	<i>Distance Learning</i>
<i>Communication</i>	<i>Allow up to 48 hours for a response to emails.</i>

Policies

<i>Grading/Evaluation</i>	Grades are a summation of: Class Participation/attendance (20%), Lab 1 (25%), Lab 2(25%), Lab 3(30%)
<i>Test/ Exam Taking</i>	<i>Due to the virtual nature of classes, it is expected that during testing cameras are on and the professor is given access to your computer for monitoring.</i>
<i>On Time Delivery</i>	<i>Discussion Post & homework assignments are due by 11:59PM on the assigned day. They are to be completed using open-notes/book with no classmate interaction. Late assignments are -10points for everyday late.</i>
<i>Extra Credit & Make-Up</i>	<i>No make-up, extensions, resubmissions, or extra credit is available. Grades are earned exclusively based on completion of assignments within the set time frame.</i>

<i>Students w/ Disabilities</i>	The University is obligated to provide appropriate accommodations as needed. Please inform the instructor of any accommodations relative to disabilities.
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Code of Academic Integrity

This course is subject to the Morehouse code of Academic Integrity available at <https://www.morehouse.edu/academics/integrity.html>. This applies to plagiarism, defiling school property, cheating, falsifying documentation, submitting purchased or previously submitted assignments, etc. Judgement of these aforementioned activities is subject to the instructors discretion and can result in academic penalty included but not limited to failure of the course.

Course Organization and Content

<i>Class</i>	<i>Date</i>	<i>Topic</i>
1	1/24	Course Introduction Lab 1: Use of Excel to Solve Optimization Problem
2	1/31	Lab 1: Continued
3	2/7	Lab 1: Continued Lab Report Due - 2/14
4	2/14	Lab 2: Design & Modeling of Emergency/Homeless Shelter
5	2/21	Lab 2: Continued
6	2/28	No Class: Midterms
7	3/7	No Class: Spring Break
8	3/14	Lab 2: Continued Lab Report Due - 3/21
9	3/21	Lab 3: Bridge Design
10	3/28	Lab 3: Continued
11	4/4	Lab 3: Presentations Lab Report Due - 4/18
12	4/11	No Class: Easter Break
13	4/18	Bridge Competition

Note: This is tentative and subject to change if necessary!

COVID-19 Syllabus Addendum: Spring 2022

The following policies are intended to guide instructional practices for the Spring 2022 term so that they are conducted in as safe a manner as possible while still allowing for instruction. For the safety of students and instructors, selected Spring 2022 courses are being offered in the Online. Students attending courses in person are expected to comply with the following protocols. Students who are unwilling to do so will be asked to leave the classroom, with the option to return as soon as they agree to follow safety protocol.

Note: These policies are subject to change based on national, state, and local guidelines and the state of the pandemic.

Masks

All students must wear masks while going to class, transitioning between classes, and during face-to-face instruction.

Social Distancing

All classroom participants are to maintain a distance of at least six feet from one another. As a general practice, when students enter a classroom, they should select a seat farthest from the door. They also should use hand sanitizer located at the classroom entrance. Doing so will minimize germs in the learning space. When students exit a classroom, those seated closest to the door should be the first to leave, followed by those next closest to the door, and so on.

Transition between Classes

Students must not congregate within classroom buildings during transitions or while waiting for classes to begin. Students must also avoid lingering in classrooms after the class session to allow the next class to enter in a timely fashion. Students with questions of an instructor are asked to email the instructor.

Eating and Drinking in the Classroom

Students are asked to refrain from eating in the classroom. By doing so, we promote a hygienic work environment and limit the number of times we need to loosen or temporarily remove our masks. At the instructor's discretion, students are permitted to have drinks in the classroom, if the drinks can be consumed with minimal de-masking. Students with medical conditions that require them to eat during the time a class session occurs should speak with their instructor to identify reasonable options.

Office Hours and Visits

All students are expected to wear masks during office hours and visits and practice social distancing. Please note that instructors can hold these meetings virtually at their discretion.

Students Who are Ill

Students or instructors who develop any symptoms associated with COVID-19 as outlined by the CDC are not to attend class or any other Morehouse-related activity in person. Students should alert their instructor and academic advisor to the fact that they will be unable to attend classes. Students and instructors can continue to work remotely until they are cleared to return to the classroom.