Course Title: Economic Analysis and Technical Applications
Course Prefix: CHEG **Course No.: 2003** **Section No.: P 02**

Department of | Chemical Engineering | College of | Engineering

"Reading is a Brain Feeding"

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"Drive Slowely on The Highways and Drive Fast in The Classrooms"

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Words of Cautions

"Please Drive Reasonably and Follow-up the Driving Rules on the Highways. However, I Hope Everyone Drives Fast in the classroom (i.e. Earning High grades 90 and above) as You Drive Fast on the Highways"

"Always Brain Train is The Best Method to Grasp and Remember the Knowledeg"

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Instructor Name: *Dr. Safwat H. Shakir*
Office Location: S.R. Collins Room 313
Office Phone: *936-261-9879*
Fax: *936-261-9419*

Email Address: *shshakir@pvamu.edu*
U.S. Postal Service Address: Prairie View A&M University
P.O. Box | 519
Mail Stop | **2505**
Prairie View, TX 77446-0519

Office Hours: | T&TH 3:00 PM-5:30 PM or by appointment
Virtual Office Hours: | None

Course Location: New Electrical Engr Bldg. 115

Class Meeting Days & Times: New Electrical Engr Bldg. 115 3:30-4:50 **and Lab time is in 5:30-6:20 PM in** S.R. Collins 116

Catalog Description: **CHEG 2003. Economic Analysis and Technical Applications.** (3-0) Credit 3 semester hours. Fundamental concepts of economic principles. Evaluation of technical alternatives, economic significance of technical proposals; interest,

	description, analysis, and forecasting.
Prerequisites: **Co-requisites:**	Prerequisites or co-requisites: MATH 1124
Required Text:	**"Engineering Economic Analysis By Donald G.Newn Jrome P Lavelle and Ted G. Eschenbach – Fourteenth Edition 2019 ISBN- 978-0-19-093191-9**
Recommended Text/Readings:	**1. Basics of Engineering Economy" By Leland Blank and Anthony Tarquin. 2014. McGraw-Hill Higher Education. ISBN 978-0-07-340129-4Sullivan, W.G., Wicks and Koelling, J.A. Engineering Economy, 14th Edition, 2009, Prentice-Hall. ISBN -10-0136142974.** **2. C. S. Park, Contemporary Engineering Economics, 4th Ed. 2007, Prentice-Hall. ISBN- 0-13-187628** **3. "Fundamentals of Engineering Economic Analysis" by John A. White; Kellie S. Grasman, Kenneth E. Case, Kim LaScola Needy and David B. Partt. First Edition-Wiley, 2013 ISBN 978-1-118-41470-5**
Access to Learning Resources:	PVAMU Library: phone: (936) 261-1500; web: http://www.tamu.edu/pvamu/library/ University Bookstore: phone: (936) 261-1990; web: https://www.bkstr.com/Home/10001-10734-1?demoKey=d

Course Goals or Overview:

1) To provide students with the principles of economics and their applications in Engineering.
2) Projects alternatives play a crucial role in the areas of production, processing, fabrication and manufacturing of all man-made products.
3) The profitability or cost of the project is a necessary condition for giving the project the green light for funding and execution.
4) The course provides the students with technical and engineering aspects of assessing different projects either in their professional career or in private life.
5) The course provides the students with core aspects of critical thinking, to develop a quantitatively skills, expand students' knowledge of the human condition and human cultures to economics, and social behavioral aspects in the society in addition to strengthen the students ability of presenting judgment about the economic aspects of engineering projects they are going to deal with in real life.
6) To provide the students with the 10 principles of engineering economic analysis as 1)Money has a time value; 2)make the investments that are economically justified; 3) Chose the mutually exclusive investment alternative that maximizes economic worth; 4) compare between investments of two alternatives or more; 5) Study the marginal revenue that must exceed marginal costs; 6) Continue to invest as long as each additional increment of investment yields a return that is greater than the investor's Time Value of Money; 7)Consider only difference in cash flows among investment alternatives; 8)Compare investment alternatives over a common period of time; 9)Risk and returns tends to be positively correlated; and 10)Past costs are irrelevant in

	engineering economic analyses, unless impact future costs.

Course Outcomes/Objectives

At the end of this course, the student will have achieved and demonstrated the following outcomes.

1	Understand the economic principals, and economic terms
2	Understand the economic and mathematical equations used in the economic analysis.
3	Understand the economic costs, methodologies of assessing the costs, cost estimation and cost concepts.
4	Understanding the time value and project cash flow in engineering and economy.
5	Understand the comparison of alternatives for different projects.
6	Understand Break Even Analysis, income tax, risk analysis and depreciation.
7	Understand of Capital investment in the engineering projects.

Course Objectives/Accrediting Body (NCATE, ABET, NAAB, etc…) Standards Met:

Core Curriculum Objectives		ABET Outcomes Based Assessment Criteria	
1	**Critical Thinking**: Creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information	**1**	Ability to apply knowledge of math, science and engineering; ability to identify and formulate solutions to technical problems
2	**Communication**: Effective development, interpretation and expression of ideas through written, oral and visual communication	**3**	An ability to function on multi-disciplinary Teams
3	**Empirical and Quantitative Skills**: Manipulation and analysis of numerical data or observable facts resulting in informed conclusions	**4**	The broad education Necessary the impact of engineering Solution in Global and Societal Context.
4	**Social Responsibility**: Intercultural competence, knowledge of civic responsibility, and the ability to engage effectively in regional, national, and global communities	**4**	Ability to understand the impact of technology solutions in a global and societal context. (this is for ABET and Core Curriculum)

Course Requirements & Evaluation Methods

This course will utilize the following instruments to determine student grades and proficiency of the learning outcomes for the course.

Exams or Quizzes – written tests designed to measure critical thinking and quantitative skills as demonstrated by their ability to apply knowledge of economic principles to solve problems relevant to engineering and other technical subject areas.

Exercises or **Homework** – written assignments designed to develop quantitative skills and critical thinking by use of a problem-solving strategy, relevant formulae and tables, plus recitation and practice for reinforcement.

Projects or Assignments – designed to develop and demonstrate critical thinking and quantitative skills on a problem with large scope to require teaming that is set in a context promoting awareness of social responsibility on a local through global level, with oral and written reporting required to develop and demonstrate communication skills.

Class Participation – daily attendance and participation in class discussions

Exams or Quizzes – written tests designed to measure knowledge of presented course material
Exercises or **Homework** – written assignments designed to supplement and reinforce course material
Projects or Assignments – designed to measure ability to apply presented course material
Class Participation – daily attendance and participation in class discussions

(instruments will vary slightly depending on the course)

Grading Matrix

Instrument	**Value (points or percentages)**	**Total**
Exams or popup questions &Quizzes	4 Exams	10% each with a total 40%
Mid Term Exam	Mandatory	20%
Projects*	Project	
Attendance, participation and presentation and solving problems in groups in the lab is Mandatory from 5:30-6:30 PM)	**Very important**	10%
Final Exam	Mandatory	30%
Total:		**100%**
Discount for lack of participation	**Very important**	**-20%**

**** Homework assignments are for helping you to understand the materials in the class. You are responsible for all presented materials in the class.***

GRADING SYSTEM

The standard university grading scale is indicated below.

Grade	Meaning	Score Range	Grade Values
A	**Excellent**	**90 – 100**	**4**
B	**Good**	**80 – 89**	**3**
C	**Satisfactory**	**70 – 79**	**2**
D	**Passing**	**60 – 69**	**1**
F	**Failing**	**0 – 59**	**0**
S	**Satisfactory**	**70 – 100**	**0**
U	**Unsatisfactory**	**0 – 69**	**0**
I	**Incomplete**		**0**
W	**Withdrawal from a course**		**0**
WV	**Withdrawal from the University Voluntarily**		**0**
MW	**Military Withdrawal**		**0**

Formatting Documents:

Microsoft Word is the standard word processing tool used at PVAMU. If you're using other word processors, be sure to use the "save as" tool and save the document in either the Microsoft Word, Rich-Text, or plain text format.

Exam Policy

Exams should be taken as scheduled. No makeup examinations will be allowed except under documented emergencies (See Student Handbook).

Professional Organizations and Journals

None

References

1) **C. S. Park, Contemporary Engineering Economics, 4th Ed. 2007, Prentice-Hall. ISBN- 0-13-187628-7.**

Course Regulations in Addition to University Rules and Procedures

- Students will conduct themselves in a manner that is respectful to their fellow classmates and the instructor at all times.
- **Cell phones, iPad and smart phones or similar electronic devices MUST** be turned off and stowed away during class time. Students are **NOT** allowed to leave class to answer cell phones or use these devices.
- Students caught using iPad and smart phones or similar electronic devices during exams will receive **ZERO** for the exam and be subject to sanctions as stipulated under **Academic Misconduct**.
- Students should be prepared to stay in the classroom for the duration of the exam. Students who have any condition that may require them to leave the exam room should make prior arrangements with the Instructor. Students who decide to leave the exam room for any other reason must handover their exam paper and consider the exam over for them.
- Programmable calculators are **NOT** allowed in class.
- Students are **NOT** allowed to wear caps/hats in class.
- Arrive to class prepared to discuss lesson; always bring essential tools: Textbook, paper, calculator.
- **NO make-up exams unless there is an appropriate written excuse**
- **Failing to attend Mid-term and Final Exams will result in "F" grade in the final course grade.**
- ***Special attention must be taken in case of unexpected circumstances in case of not attending the Mid-term or final exam.*** **You need to get the appropriate approval, signature and documentation from the university. Otherwise the final grade will result in "F" Grade. With appropriate documentation and you have attended the class during semester in all class time and you have taken all previous exams and submitted the popup quizzes …etc. you will be assigned a "grade I" with appropriate approval from Head of the Department, Dean of the College, and the University Academic Affairs.**
- ***Curve the grade is not allowed, however it may be can be monitored within 5% of the average grades.*** **If curving the grade applied, it will be applied to all the students in the class.**

University Rules and Procedures

Disability statement (See Student Handbook):
Students with disabilities, including learning disabilities, who wish to request accommodations in class should register with the Services for Students with Disabilities (SSD) early in the semester so that appropriate arrangements may be made. In accordance with federal laws, a student requesting special accommodations must provide documentation of their disability to the SSD coordinator.

Academic misconduct (See Student Handbook):
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 Handbook, especially the section on academic misconduct. Students who engage in academic misconduct are subject to university disciplinary procedures.

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 mastered; giving or receiving aid unauthorized by the instructor on assignments or examinations.

2. Academic misconduct: tampering with grades or taking part in obtaining or distributing any part of a scheduled test.

3. Fabrication: use of invented information or falsified research.

4. Plagiarism: unacknowledged quotation and/or paraphrase of someone else's words, ideas, or data as one's own in work submitted for credit. Failure to identify information or essays from the Internet and submitting them as one's own work also constitutes plagiarism.

5. **Cheating in any form will result for the student grade will be "F".**

Nonacademic misconduct (See Student Handbook)
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, (2) the inability of other students to profit from the instructional program, or (3) campus behavior that interferes with 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 Dean of Students under nonacademic procedures.

Sexual misconduct (See Student Handbook):
Sexual harassment of students and employers at Prairie View A&M University is unacceptable and will not be tolerated. Any member of the university community violating this policy will be subject to disciplinary action.

Attendance Policy:
Prairie View A&M University requires regular class attendance. Excessive absences will result in lowered grades. 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.

Student Academic Appeals Process
Authority and responsibility for assigning grades to student's 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 Undergraduate Catalog and by doing so within thirty days of receiving the grade or experiencing any other problematic academic event that prompted the complaint.

Technical Considerations for Online and Web-Assist Courses

Minimum Hardware and Software Requirements:

-Pentium with Windows 7 or PowerMac with OS 9
-56K modem or network access
-Internet provider with SLIP or PPP
-8X or greater CD-ROM
-64MB RAM
-Hard drive with 40MB available space
-15" monitor, 800x600, color or 16 bits
-Sound card w/speakers
-Microphone and recording software
-Keyboard & mouse
-Netscape Communicator ver. 4.61 or Microsoft Internet Explorer ver. 5.0 /plug-ins
-Participants should have a basic proficiency of the following computer skills:
- ·Sending and receiving email
- ·A working knowledge of the Internet
- ·Proficiency in Microsoft Word
- ·Proficiency in the Acrobat PDF Reader
- ·Basic knowledge of Windows or Mac O.S.

Netiquette (online etiquette): students are expected to participate in all discussions and virtual classroom chats when directed to do so. Students are to be respectful and courteous to others in the discussions. Foul or abusive language will not be tolerated. When referring to information from books, websites or articles, please use APA standards to reference sources.

Technical Support: Students should call the Prairie View A&M University Helpdesk at 936-261-2525 for technical issues with accessing your online course. The helpdesk is available 24 hours a day/7 day a week. For other technical questions regarding your online course, call the Office of Distance Learning at 936-261-3290 or 936-261-3282

Communication Expectations and Standards:
All emails or discussion postings will receive a response from the instructor within 48 hours.

You can send email anytime that is convenient to you, but I check my email messages continuously during the day throughout the work-week (Monday through Friday). I will respond to email messages during the work-week by the close of business (5:00 pm) on the day following ***my receipt*** of them. Emails that I receive on Friday will be responded to by the close of business on the following Monday.

Submission of Assignments:
Assignments, Papers, Exercises, and Projects will be distributed and submitted through your online course. Directions for accessing your online course will be provided. Additional assistance can be obtained from the Office of Distance Learning.

Discussion Requirement:
Because this is an online course, there will be no required face to face meetings on campus. However, we will participate in conversations about the readings, lectures, materials, and other aspects of the course in a true seminar fashion. We will accomplish this by use of the discussion board.

Students are required to log-on to the course website often to participate in discussion. It is strongly advised that you check the discussion area daily to keep abreast of discussions. When a topic is posted, everyone is required to participate. 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 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, it should be copied and pasted to the discussion board.

READING/LABORAORY ASSIGNMENT/HOMEWORK

WEEKS	READING/LABORAORY ASSIGNMENT/HOMEWORK	Chapters/Study Guide
WEEK 1	❖ **Chapter 1**: Foundations of Engineering Economy and making Economic decision, cost and benefits and Estimating Cost	
WEEK 2	❖ **Chapter 2**: Factors: How Time and Interest Affect Money, and interest equivalence	
WEEK 3	❖ **Chapter 3** Nominal and Effective Interest Rates	
WEEK 4	❖ **Chapter 4:** Present Worth Analysis	
WEEK 5	❖ **Chapter 4:** Continue Present Worth Analysis	
WEEK 6	❖ **Chapter 5**: Annual Worth Analysis	
WEEK 7	❖ **Chapter 6**: Rate of Return Analysis	
WEEK 8	❖ **Chapter 7**: Benefit/Cost Analysis and Public Sector Projects. ❖ **Chapter** 8: Breakeven, Sensitivity, and Payback Analysis.	
WEEKS 9	❖ **Chapter 9**: Replacement and Retention Decisions	
WEEK 10	❖ **Chapter 10**: Effects of Inflation and Price Change	
WEEK 11	❖ **Chapter 11**: Minimum Attractive Rate of Return	
WEEK 12	❖ **Chapter 12**: Depreciation Methods	
WEEK 13	❖ **Chapter 13**: After-Tax Economic Analysis	
WEEK 14	❖ Case study	
WEEK 15	**Review Materials**	
WEEK 16	**FINAL EXAMINATION**	
Exams – Tests and Quizzes	**Please see the University calendar and the exams will be announced in the class. Please attend the class all the time**	

LABORAORY ACTIVITIES DURING THE SEMESTER (LAB TIME – MANDATORY ATTENDANCE

WEEKS	READING/LABORAORY ASSIGNMENT/HOMEWORK	Chapters/Study Guide
WEEK 1	❖ **Chapter 1**: Case studies and practical solving problems for Foundations of Engineering Economy	

WEEK 2	❖ **Chapter 2**: Case studies and practical solving problems for Factors: How Time and Interest Affect Money	
WEEK 3	❖ **Chapter 3** Case studies and practical solving problems for Nominal and Effective Interest Rates	
WEEK 4	❖ **Chapter 4:** Case studies and practical solving problems for Present Worth Analysis	
WEEK 5	❖ **Chapter 4:** Case studies and practical solving problems for Continue Present Worth Analysis	
WEEK 6	❖ **Chapter 5**: Case studies and practical solving problems for Annual Worth Analysis	
WEEK 7	❖ **Chapter 6**: Case studies and practical solving problems for Rate of Return Analysis	
WEEK 8	❖ **Chapter 7**: Case studies and practical solving problems for Benefit/Cost Analysis and Public Sector Projects. ❖ **Chapter** 8: Case studies and practical solving problems for Breakeven, Sensitivity, and Payback Analysis.	
WEEKS 9	❖ **Chapter 9**: Case studies and practical solving problems for Replacement and Retention Decisions	
WEEK 10	❖ **Chapter 10**: Case studies and practical solving problems for Effects of Inflation	
WEEK 11	❖ **Chapter 11**: Case studies and practical solving problems for Estimating Cost	
WEEK 12	❖ **Chapter 12**: Case studies and practical solving problems for Depreciation Methods	
WEEK 13	❖ **Chapter 13**: Case studies and practical solving problems for After-Tax Economic Analysis	
WEEK 14	❖ Case studies and practical solving problems in general and preparation for the final exam	
WEEK 15	Case studies and practical solving problems for **Review Materials for the final exam**	
WEEK 16	**FINAL EXAMINATION**	
Exams – Tests and Quizzes	**Please see the University calendar and the exams, tests, quizzes will be announced in the class. Please attend the class all the time**	

Academic Calendar – Fall 2019

Aug 26 Monday	First Class Day
Aug 26 Monday	Tuition & Fees Payment Due Date
Aug 26 - Sep 03 Monday through Tuesday	Attendance Reporting Period (NS/SH) Students who do not attend class during this period will have their courses removed and financial aid reduced or cancelled
Aug 26 Monday	Late Registration Fee Begins ($50.00)
Aug 30 Friday	Final Day to Register with Late fee 12:00 am - 12:00 am
Aug 31 Saturday	Final Day to Add a class(s) for credit
Sep 02 Monday	Labor Day Holiday (University Closed)
Sep 09 Monday	Financial Aid Refunds Begin
Sep 11 Wednesday	12th Class Day (Census Date)
Sep 11 Wednesday	Final Day to Drop/Withdraw from Course(s) without Academic Record (A Financial Record will still exist)
Sep 12 Thursday	Withdrawal from Courses with Academic Record (“W”) Begins
Sep 17 Tuesday	Drop for Non-Payment of Tuition and Fees @ 5:00 p.m.
Oct 17 - Oct 19 Thursday through Saturday	Mid-Semester Examination Period
Oct 22 Tuesday	Mid-Semester Grades Due
Oct 31 Thursday	Final Date to Apply for Fall 2019 Graduation (ceremony participation)
Nov 01 Friday	Final Day to Withdraw from Course(s) with Academic Record (“W”)
Nov 01 Friday	Application for Graduation-Degree Conferral only for Fall 2019 Graduation Begins (no ceremony participation or name listed in the program)
Nov 01 Friday	Final Day to Withdraw from Course(s) with Academic Record (“W”) – Fall 2019 16-week session
Nov 11 Monday	Priority Registration for continuing students for Spring and Summer semesters
Nov 18 Monday	Pre-Registration for all other student for the Spring and Summer semesters
Nov 21 - Nov 22	Thanksgiving Holiday (University Closed)

Thursday through Friday	
Dec 02 - Dec 03 Monday through Tuesday	Course Review Days (Classes must convene and instructors will prepare students for final exams)
Dec 03 Tuesday	Final Day to Apply for Degree Conferral only for Fall 2019 Graduation (no ceremony participation or name listed in the program)
Dec 03 Tuesday	Last Class Day
Dec 03 Tuesday	Final Day to Submit Application for Tuition Rebate for Fall Graduation 2019 (Undergraduate Candidates)
Dec 03 Tuesday	Final Day to Withdraw from the University (from all courses) for the Fall 2019 16-week session
Dec 04 - Dec 10 Wednesday through Tuesday	Final Examination
Dec 12 Thursday	Final Grades due for Graduation Candidates (12:00 p.m.) – Fall 2019 16-week session
Dec 14 Saturday	Commencement
Dec 17 Tuesday	Final Grades due for all other students (11:59 p.m.)

Please look at the university website for any changes and requirements and announcements