**Pittsburg State University**

**College of Technology**

**Department of Engineering Technology**

**COURSE TITLE:** ETECH-502 –01, 02 Engineering Economics

**Course Intended for Partial Fulfillment of the Pitt State Pathway Curriculum**

**COURSE SCHEDULE:** MWF-01, 10-10:50 AM Room S105 (Face to Face)

 MWF-02, 1-1:50 PM, Room S105 (Face to Face)

**PROFESSOR:** Book, Rebeca Office: Room # W122C

Phone: (620) 235-4034 Fax: (620) 235-4004

E-mail: rbook@pittstate.edu

**OFFICE HOURS**: 9-10, 11-11:30 AM 12:30-1, 2-3 PM MWF 9:30-11:30AM TUTH

**Pitt State Pathway Mission Statement**: The *Pitt State Pathway* curriculum serves as the heart of the university education by fostering interdisciplinary competencies that typify the educated person. It is designed to facilitate the development of key proficiencies including communication and information literacy. The *Pitt State Pathway* curriculum provides a transformational experience that challenges students to think creatively and critically, and to immerse themselves in the productive examination of humans in their global setting. By encouraging the development of skills that promote life-long learning, the *Pitt State Pathway* fosters a sense of personal responsibility, an appreciation of diversity, and an understanding of interconnectedness in our truly global society.

**Pillar of the Pitt State Pathway and Learning Outcomes to be Covered in This Course:**

**GLOBAL UNDERSTANDING AND CIVIC ENGAGEMENT**

As global citizens, students need a comprehensive understanding of where they live and of the larger, interconnected global system of which they are part, and on which they depend. While identifying commonalities among people and places is important, it is crucial that students understand and appreciate the diverse cultural, social, political, economic, and environmental contexts that create differences. Understanding the role of responsible citizens in their own community and beyond ensures effective and ethical participation at all levels. Students also need to understand how biological, physical, and chemical systems work, how they change naturally, and how they can change due to human involvement. Understanding the implications of the interaction between humans and non-human systems is essential for long-term decision-making.

**Learning Outcome:** Students will explore global systems conscientiously*.*

**Pitt State Pathway Core Element to be Covered in This Course:**

**Human Systems within a Global Context:**

Humans have developed complex systems that structure interaction. It is important to understand how and why these systems developed, change through time, vary by location, and are interconnected at all levels (local/regional/global), and the implications of that interconnectedness. Competency in this element means:

* *Analyzing* the structure, development, and change of human economic, political, social and/or cultural systems over time;
* *Analyzing* the individual’s role and responsibility to society at all levels;
* *Evaluating* how human systems are interconnected at all levels.

**Companion Element to be Covered in This Course: Social Responsibility Within a Global Context**

Social responsibility within a global context is the ability to recognize one’s accountability to society – locally, nationally, and globally. This incorporates the importance of active citizenship through the application of concepts such as equity, inclusiveness, collaboration, and building constituency in government, civic institutions, business, and community at large. Competency in this element means:

* *Applying* the concepts associated with active, responsible citizenship;
* *Analyzing* the ethical, social, and environmental consequences of local, national, and global organizations;
* *Analyzing* the historical consequences of local or national decisions on global systems.

**COURSE DESCRIPTION:** ETECH-502 Engineering Economy (3 hours)

Analysis of engineering proposals utilizing time value of money and related factors. Includes depreciation and after-tax consequences, feasibility and optimum life comparisons. Additional topics for three hours of credit are manufacturing cost studies, estimating, sources of costs, allocation of costs and justifications.

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**COURSE OBJECTIVES:**

**Objective 1:** *Analyzes* human organizational systems using a variety of disciplinary and interdisciplinary perspectives

**Objective 2:** *Describes* human organizational systems using a variety of disciplinary and interdisciplinary perspectives

 **Objective 3:** *Describes* the roles and responsibilities of citizens at all levels

**METHODS OF ASSESSMENTS:**

 **Methods for Objective 1:**

1. Use mathematical and graphical techniques, such as learning curves and break-even analysis, to evaluate manufacturing cost estimates and economic decisions. (Assignment #2 and Test #1.))
2. Measure the time value of money. (Assignments #3-9, Test #2.)
3. Evaluate product/project decisions with economic analysis methods. (Assignments #13-20 and Tests #3-5)

**Methods for Objective 2:**

1. Identify terms associated with the manufacturing of a product. (Matching on Test #1.)
2. Recognize depreciation methods. (Assignments #21-23, Test #6)
3. Define taxable income and practice estimating taxes for business & individuals. (Assignments 24-25, Test #7)

**Methods for Objective 3:**

1. Recognize professional and ethical responsibility and how engineering technology can affect society. (ETAC-ABET i) (Listing on Test #1, video evaluation, and ethics paper.)
2. Work effectively in teams. (ETAC-ABET e) (Group project and peer evaluations)

**COURSE TOPICS:**

Economic Analysis: Estimating:

Making Economic Decisions Engineering costs and cost estimating

Interest and Equivalence Estimating Process

Interest formulas Labor cost estimating analysis

Present worth analysis Estimation of Manufacturing Costs

Rate of return analysis Ethics

Incremental Analysis Team Project

Depreciation, Income Taxes

**TEXTBOOK/MATERIALS REQUIRED:**

* **Engineering Economic Analysis** – by Newman, Oxford University Press, Inc. 13th edition, ISBN: 978-0-19-029690-2
* Microsoft Office Products including Word and Excel
* Internet Access and a CANVAS Account

**GRADING SYSTEM**: Grades will be based on the following scale and proportional system:

 90 - 100 A

 80 - 89 B

 70 - 79 C

 60 - 69 D

 59 - 0 F

 Course activities will contribute to the final grade in the following proportions:

 Homework Assignments (26, drop 2 lowest scores) 30%

 Exams (7 exams, drop lowest score) 30%

 Ethics Paper 15%

 Estimating Projects 25%

 100%

**Etiquette Expectations (Netiquette):**

* It is expected that all students will communicate with one another and the professor in proper tone and civility, whether the communication is by electronic means, by ph0ne, or face-to-face.
* E-mails are to be written in standard speaking style and not in popular abbreviations used online and/or using regional colloquialisms.
* Proper spelling and grammar are expected in communications with other students and the professor.
* Please be aware of and sensitive to all cultural differences of students and the professor when communicating.

**Course and University Policies:**

* Any student who, because of a disabling condition, may require special arrangements in order to met course requirements should contact me as soon as possible to make necessary accommodations. Please click the link to the Syllabus Supplement for more detailed information: <https://www.pittstate.edu/registrar/syllabus-supplement.html>
* As stated in the Syllabus Supplement regarding Dead Week Policy: “no tests or major assignments will be presented during the week prior to final examination week, unless identified in the course syllabus presented at the start of the semester.” For this class, final points, the syllabus, assignments, due dates, exams, and/or quizzes may be changed accordingly throughout the semester as deemed necessary by the professor.

**Minimum Technology Requirements:**

* Gorilla Geeks is a great resource for technical issues with Canvas, log-ins, etc. They can be reached at the following:
* Gorilla Geeks Help Desk: 1-620-235-4600
* E-mail: geeks@pittstate.edu
* Web site: <https://www.pittstate.edu/it/gorilla-geeks.html>
* Most everyone is new to the Learning Management System (LMS) of Canvas. If you are not completely comfortable with Canvas please click the link to a Canvas help page:

https://www.pittstate.edu/it/information-technology-services/canvas.html

* Students will need to be familiar and competent with general computer skills such as downloading information, saving, and uploading. Advanced skills that may be necessary are video chat (mic and webcam) and uploading Power Point Presentations with a self-video embedded within.
* If you have technical questions, you can message the professor, use the Help menu the Canvas menu has to the left, and/or contact Gorilla Geeks (see above for contact information.)

## **Special Instructions:**

## Directions and instructions other than those listed in this course outline will be given as necessary.

* The use of tobacco products is not permitted in the Kansas Technology Center.
* The consumption of food and drink is not permitted in the computer classroom.
* Reference citing: if you quote a piece of data, you must be able to tell where you found it, unless you developed the information through your own research.
* Academic Misconduct: You are expected to abide by the Pittsburg State University Code of Student’s Right and Responsibilities as shown at:
* <http://www.pittstate.edu/audiences/current-students/policies/rights-and-responsibilities/>

**Tentative Schedule of Activities**

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| **WEEKLY**  | **CLASS CONTENT** | **ASSIGNMENTS**  |
| **1** | **In Introduction, Econ. decisions; Cash flow diagrams,**  **Unit Pricing, Learning Curve, Cost Index, Powerpoint #1 Ch. 1,2** | **1,2**  |
|  **2** |  **Martin Luther King Holiday, Review, Test #1****Interest & equiv., Spreadsheets – Excel Ch. 3** | **Review, Test #1**  |
|  **3** |  **Compound interest Ch.3, 4**  |  **3 ,4, 5**  |
| **4** | **U Uniform series, Arithmetic & geometric gradient Ch. 4** | **6, 7, 8** |
| **5** | **N Nominal vs. effective interest, Continuous compounding,**  **Career Services Ch. 4** | **9, Test #2, 10** |
| **6** | **Ethics Video, Powerpoint #2, #3, #4, Ethics Paper** | **11, 12**  |
| **7** | **Present Worth Analysis Ch. 5** | **13, 14** |
| **8** | **Test #3, Annual Worth Analysis Ch. 6**  | **15, Test #3, 16** |
| **9** | **Spring Break** |  |
|  **10** | **Annual Worth Analysis, Test #4, Ethics Paper Due Ch.6** | **17, Test #4, Paper due**  |
| **11** | **Rate of Return Analysis, Incremental Analysis Ch.7,8**  | **18, 19, 20** |
| **12** | **Test #5, Depreciation, Start Group Project Ch. 11**  |  **Test #5, 21, 22, Group Project**  |
|  **13** | **Depletion, Test #6, Project Ch. 11** | **23, Test #6, Group Project**  |
|  **14** | **Income Taxes Ch. 12, 12A** | **24, 25, Group Project**  |
| **15** | **Test #7, Project Presentations**  | **Test #7, Group Project** |
|  **16** | **Individual Projects Paper Due** |  **Individual Project** |
| **17** | **Finals Week – Individual Project Reviews Due** | **Individual Project**  |