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Time: M 4-7 pm    Office: Speare 132

This course will meet in one of the NMT on-campus distance education classrooms and in the New Mexico Tech distance education classroom located at 2808 Central Ave SE in Albuquerque. As a NMT distance course, the course is also available via NMT’s live webcast capabilities. Students are expected to attend and participate actively in all classes either in person or, in the case of students in remote locations, via the course portal.

You should have had, at a minimum, a statistics course such as MATH 283 in order to take this course. If you do not have any statistics background at all, please see me as soon as possible. Some familiarity with spreadsheet modeling (we will use Excel) and optimization would also be very helpful.

Overview

The focus on this course is on development of models of project networks that can be used to plan, monitor, and control complex projects. We will develop work breakdown structures that will then lead to PERT charts that will enable Critical Path Method (CPM) analysis. Probability models will be developed for cost and time-to-completion for each activity. These modeling activities will enable a hands-on approach to project risk management.

Students will be required to work on a real project; team projects are encouraged. A background in probability and/or statistics is necessary, and some limited programming skills would also be useful. We will use Microsoft Excel for most of our modeling efforts, and experience creating spreadsheet models and writing simple programs in VBA will also be useful.
Assignments are a combination of individual and team projects. You are free to work together on homework assignments, but you are each required to submit homework individually. Team projects will feature one submission per team.

Course Objectives

As a result of taking this course, students should be able to:

- Understand the organizational context of projects, especially complex projects
- Develop a Work Breakdown Structure (WBS) for a project
- Develop and analyze a PERT Chart based on the WBS
- Develop activity probability distributions for use in analysis and control of projects

Department of Management Learning Objectives

NMT Department of Management learning objectives are listed below. This course spans several of these objectives, and the best fit is objective #5.

1. Ability to identify, analyze, and evaluate global, economic and geopolitical problems impacting the internal and external environments of technology organizations.

2. Understand and apply the knowledge and skills required for today's engineering, science, and technology managers to solve practical problems and sustain organizational growth, including managing information and projects, leading teams, making decisions, and interfacing with customers.

3. Understand and apply the general body of business and management knowledge to resource problems faced by engineering, science, and technology organizations, to include managing people, financial, marketing, and operational resources.

4. Ability to identify, analyze, and evaluate the risks associated with developing and commercializing new technologies and products, and research new business formation and growth.

5. Ability to formulate and model unstructured problems using multiple analytical tools and techniques.

6. Understand and apply state-of-the-art management and business tools and techniques to drive process improvements in engineering, science, and technology organizations.

7. Understand and apply the execution of managerial functions in business and public organizations, covering the fields of accounting, finance, marketing, applied operations research, business law, and managerial economics.
**Texts (required and optional)**


There are many, many other references available for this topic. As you may see above, the Project Management Institute has many available references.

Readings will also be provided to supplement course discussions.

**Grading**

Grading will be based on the following:

*Individual homework assignments* (25%): there will be weekly assignments that may consist of reading assignments, a modeling exercise, and updating of course projects. Homework assignments may include short, formal presentations to the class. Students will also be evaluated with regard to reading assignments based on their contributions to reading-related class discussions.

Homework should be submitted electronically to my email address (see above). The filename should start with your name and then have the name of the assignment. For example:

YournameHomework1.filetype

Homework is due before the start of class each Monday. You will receive an email acknowledgement when I receive your homework submission.

Undergraduates are allowed to drop two homeworks. If undergraduates turn in all homeworks, two will be considered as extra credit.

LATE HOMEWORK WILL NOT BE ACCEPTED.
Team projects and presentations (40%): a key component of the course grade is the student course project and presentations. NMT design team projects may be suitable for analysis as projects for this class. Other sources of projects are also acceptable, especially real-world projects. Identification of course projects will be done early in the course.

The projects will be evaluated based on a short paper (less than 10 pages) and a course presentation (grad students only).

Exam (25%): there will be an in-class exam that will be announced two weeks prior to the exam date. You may use your notes, homework assignments, and/or anything else that is relevant – except for the internet – for the exam.

Additional information about the exam, which will occur in the second half of the course, will be provided as we move along.

Class Participation (10%): Class participation will be assessed based on informal contributions to class discussions and the quality of student summaries of homework and ongoing assignments.

The usual scale (90-100 => A, etc.) applies.

Counseling and Disability Services

New Mexico Tech is committed to protecting the rights of individuals with disabilities. Qualified individuals who require reasonable accommodations are invited to make their needs known to the Office of Counseling and Disability Services (OCDS) as soon as possible. In addition, New Mexico Tech offers mental health and substance abuse counseling through the Office of Counseling and Disability Services. The confidential services are provided free of charge by licensed professionals. To schedule an appointment, please call 835-6619.

Academic Honesty

Students are expected to adhere to all academic policies; therefore, any cheating on examinations, plagiarism or other forms of academic dishonesty will not be tolerated and will be prosecuted in accordance with NMT policies. For more information see the Academic Honesty Policy in the appropriate catalogs.
http://www.nmt.edu/images/stories/registrar/pdfs/20132014_UNDERGRADUATE_Catalog_FINAL.pdf

Cell Phones

Cell phones and similar devices will remain off during class. Students using cell phones may notice a negative impact on their class participation scores.
Tentative Major Topics Outline

Week 1: Organizational Context for Project Management
   What are the Project Metrics?
   How do we know when a project is successful?

   Student Activities for Week 2: Be prepared to say something about a course project you are considering.

   Reading Assignment for Week 2: D. McGregor, The Human Side of Enterprise (the article, not the book); Kerzner Chapters 1-3.

Week 2: Management of Projects – Working With People to Sell and Control Projects
   Organizational issues
   Control and Dissemination of information
   Acquiring and defending project resources

   Student Activities for Week 3: Present finalized information about your projects to the class; homework assignment from Kerzner text; Kerzner Chapters 5-7

Weeks 3-4: Work Breakdown Structures (WBS)
   Development of task hierarchies for class projects
   Development of the project network for class projects

   Student Activities: Development of WBS for . Presentation of progress to class. Finalization of project (aka PERT) network and development of initial spreadsheet model for project time-to-completion.

   Reading: Practice Standard for Work Breakdown Structures; homework assignment from Kerzner text; Kerzner Chapters 11-13

Weeks 5-6: Development of Probability Models for Activities
   Assessment of beta-general distribution fractiles
   Issues and assessment techniques
   Solving for distribution parameters

   Student Activities: Development of probability models for activities using the Solver function in Excel. Revision of the spreadsheet model. Homework assignment announced in class.

Weeks 7-8: Modeling and Simulation of Project Networks Overview
   Monte Carlo simulation introduction
   Development of probability distributions for metrics
Use of Probability information in controlling projects

Student Activities: Enhancement of the probability and spreadsheet models. Presentation of results to the class. Assignment to be announced; Kerzner Chapters 14-15

Weeks 9-10: EXAM

Development of Risky Cost and Resource-Allocation Models for Activities
  Relationship between time, cost, and other metrics
  Ongoing project modeling
  Tradeoff Analyses

Student Activities: Enhancement of the probability and spreadsheet models. Presentation of results to the class. Homework assignment to be assigned. Kerzner Chapter 16.

Weeks 11-12: Overall Project Risk Management – Assessment of Resource Reallocation Alternatives
  Use of the project model to develop managerial alternatives
  Use of simulation models to analyze resource configurations

Student Activities: analysis of specific managerial resource-allocation alternatives. Presentation of results to the class. Kerzner Chapter 17

Weeks 13-15: Bidding Models and Other Special Topics and Project Presentations

Student Activities: TBA