FITCHBURG STATE UNIVERSITY

These top fields will be completed by the SGOCE office.

Academic Year: * 2021-2022 SGOCE#: * 46

New Graduate Course Proposal

Form Procedure
To share the form with others prior to Submitting choose the **Save Progress** option at the bottom.
Create a PDF of the saved form go to Print and choose Save as PDF copy rather than print.
To access the saved form for editing or to finalize submission visit forms.fitchburgstate.edu to log in and view your Pending/Drafts under My Forms.

Course Title

Course Title: * Construction Scheduling & Resource Optimization

Proposed Banner Abbreviation: * Scheduling & Res. Optimization

Banner limit of 30 characters, including punctuation, spaces, and special characters.

Department/Committee Information

The main contact person for the Graduate Curriculum Committee should fill out this form.

Requestor Name: * Nirajan Mani

Members of the Graduate Curriculum Committee: Dr. Nirajan Mani, Dr. Wayne Whitfield, Dr. Soumitra Basu, Dr. Abdel Gabar Mustafa, Dr. Hong Yu

Department / Unit Developing: * Engineering Technology

Chair of Department for Program: * Nirajan Mani Chair Email: * Nirajan Mani nmani@fitchburg

Academic Dean of Department or Program: * Margaret Hoey Academic Dean E-mail: * <Dr. Hoey> mhoey@fitchburgs

Program Chair: The Program Chair for this request is among the people listed above.

* (•) Yes
( ) No

Course Information

Course Description

* This course provides the in-depth knowledge and skills in project scheduling and resource optimization. It covers short-interval scheduling, Gantt charts, linear, matrix scheduling formats, and network techniques including CPM and PERT concepts and calculations. Students will learn computer-based scheduling and resource optimization skills.

Rationale and expected outcomes of offering the Course

* The overarching objective of the course is to familiarize the students with the processes and tasks of creating an effective schedules to ensure that projects are completed on budget and on schedules.

Expected Outcomes:
1. Generate relevant project tasks, determine sequence and build schedule network to identify critical path activities and project duration
2. Allocate project resources to scheduled activities
3. Demonstrate the understanding of problems with resource constraints and apply resource allocation techniques and leveling to scheduling.
4. Explain the 4D, 5D, and 6D.
5. Explain the earned value concept and the status of the project in terms of the schedule and the budget
6. Develop a linear schedule for a project and compute the probabilities of completing the project in certain date by using PERT technique
7. Develop a competency in scheduling software

Number of Credits: * 3

Discipline Prefix or Prefixes: * CMGT

Brief rationale if more than one prefix:

Level of Course: * 7000 / 8000 / 9000

Brief rationale for level choice:: * It is a graduate level core course for M.S. in Construction Management program. It provides scheduling and resource optimization knowledge and skills.

The course will be: Requirement / Elective

Elective or Requirement Note/Special: It is a core course

Is there a similar undergraduate course? * Yes / No

How does this graduate course differ from the undergraduate one? CMGT 4010 Project Scheduling is undergraduate level course. CMGT 7XXX Construction Scheduling and Resource Optimization is an an advanced graduate level course which provides in-depth knowledge and skills.

Does this course affect offerings in any other department or program? * Yes / No

Course Enollment

Expected Average Enrollment: * 12

This course is a replacement for: Course # / Name

Has the course been offered previously as a "Topics" course? * Yes / No

Is this an Extended Campus Course? * Yes / No

Which semester will this course be offered for the first time?: * Fall 2023

How often thereafter to be offered?: * Annually

Course Requirements

Prerequisite course(s) if any:

Additional Requirements

Laboratory Hours:

Fieldwork Hours:

Pre-Practicum Hours:

Practicum Hours:

Other Requirements (specify): Graduate Standing

Syllabus Upload

New Course Syllabus Upload: MSCM_Syllabus_Scheduling_Final.pdf

Signatures

*Click on the **Submit Form** button at the bottom of the page after you have signed the form.*
You should receive an email confirmation that your signature has been completed.

...3036393934
Niraj an Mani — 03/15/2022
Requester Signature — Date

...3131373730
Niraj an Mani — 04/18/2022
Department Chair Approval — Date

Academic Dean Signature — Date

SGOCE Dean Signature — Date

Approval of the Graduate Council Date

Approval of the President Date

Notification

Reviewed by the Registrar: _____

Reviewed by the Library: _____

Retired form

SGOCE Admin. Assistant Signature | Electronically signed by Denise Bertrand on 05/01/2022 1:11:58 PM

FITCHBURG STATE UNIVERSITY

School of Graduate Online and Continuing Education (SGOCE)
Department of Engineering Technology
SYLLABUS
FALL 2023

Class Information:

Course: CMGT 7XXX (Construction Scheduling & Resource Optimization)
Credits: 3
Class Modality: Online
Class Start Date: TBD
Class End Date: TBD

Instructor Information:

Dr. Nirajan Mani
Office: CNIC 209A
Phone: 978-665-4843
Email: nmani@fitchburgstate.edu
Office Hours: M/W (11:00 A. M. – 12:15 P. M.) (By Appointment)

Textbook:

Construction Planning and Scheduling (4th edition)
Authors: Jimmie W. Hinze
Publisher: Pearson
ISBN-13: 978-0132473989

References:

A Comprehensive Guide to Project Management, Schedule and Cost Control.
Author: Randal Wilson
Publisher: Pearson
ISBN-13: 978-013357294-0
RS Means; GAO (2015), Schedule Assessment Guide (Best Practices for Project Schedules

Supplementary Materials: Handout materials will be provided by instructor

Catalog Description:

This course provides the in-depth knowledge and skills in project scheduling and resource optimization. It covers short-interval scheduling, Gantt charts, linear, matrix scheduling formats, and network techniques including CPM and PERT concepts and calculations. Students will learn computer-based scheduling and resource optimization skills.

Prerequisite: *Graduate Standing*
Required Skills: *Proficient in mathematics and Excel software*
Computer Usage: *Mandatory use electronic spreadsheets and estimating software for homework and lab.*

Course Objectives:
The overarching objective of the course is to familiarize the students with the processes and tasks of creating an effective schedule to ensure that projects are completed on budget and on schedules. Students will learn computer-based scheduling and resource optimization skills.

Students Learning Outcomes:
Student will be able to:

1. Generate relevant project tasks, determine sequence and build schedule network to identify critical path activities and project duration
2. Allocate project resources to scheduled activities
3. Demonstrate the understanding of problems with resource constraints and apply resource allocation techniques and leveling to scheduling.
4. Explain the 4D, 5D, and 6D.
5. Explain the earned value concept and the status of the project in terms of the schedule and the budget
6. Develop a linear schedule for a project and compute the probabilities of completing the project in certain dateby using PERT technique
7. Develop a competency in scheduling software

Learning Outcomes Assessment:
Assessment tools for the above learning outcomes include homework & quizzes (outcomes: 1 to 6), demonstrated lab activities (outcomes: 1, 4, 7), and exams (outcomes: 1, 2, 5, 6).

Instructor Availability:
Instructor will be available during weekdays to respond your questions or concern via university email. Please contact instructor via university email if you have any questions or concern to avoid spam issue. However, this is an online class, we will use Google Meet / Hangouts for all student requested meetings.

Instructional Strategies:
The course will be conducted in a lecture and demonstrated laboratory format (remote / online format). This class may use lectures, demonstrations, self-guided study, group discussions on the blackboard, collaborative learning groups, project work, and recorded presentations to cover the topics in this course. PowerPoint presentations, computer applications, etc. may be utilized. Some independent learning is expected of the students; they should complete assigned readings and actively engage in discussions and activities. Every effort will be made to meet the individual needs and various learning styles of the course. It is most important that you inform the instructor at the beginning of the semester of any particular unique needs.

Course Topics:
The following topics will be covered in the course. The following listing is a general indication of the order of their coverage. However, faculty instructor reserves the right to change the order of coverage and the topics to be covered based upon the class's performance and interests.

- Module 0: Introduction of Course
- Module 1: Construction Scheduling (Chapter 1)
- Module 2: Developing a network model (Chapter 2)

- Module 3: Precedence diagrams (Chapter 3)
- Module 4: Determining activity durations (Chapter 4)
- Module 5: Resource allocation and resource leveling (Chapter 6)
- Module 6: Computer scheduling (Chapter 9)
- Module 7: Schedule Quality Metrics
- Module 8: Project monitoring and control (Chapter 8)
- Module 9: Earned value (Chapter 10)
- Module 10: PERT: Program Evaluation and Review Technique (Chapter 15)
- Module 11: Linear scheduling (Chapter 14)

Grading System:

Range	Letter Grade	Quality Points
95 - 100	A	4.0
92 - 94	A-	3.7
89 - 91	A- / B+	3.5
86 - 88	B+	3.3
83 - 85	B	3.0
80 - 82	B-	2.7
77 - 79	B- / C+	2.5
74 - 76	C+	2.3
71 - 73	C	2.0
0 – 70	C-	0
Withdrawn		W
Incomplete		IN
In-Progress		IP
Audit		AU
Satisfactory		S
Unsatisfactory		U

** Grades that fall between intervals will be rounded to the higher number.*

Evaluation Criteria:

Quizzes	10%
Homework	20%
Demonstrated Labs	10%
Exam I	20%
Exam II	20%
Project	20%

** The instructor reserves the right and the responsibility for adjusting these items and their weights as necessary to meet specific situations as they may arise.*

Student Responsibilities and Class Requirements:

Each student is responsible for completing all course requirements and for keeping up with all activities of the course. Students are required to complete all assigned homework, quizzes, exams, and project work by the given deadline.

Policy on Assignments:
All assignments must be turned in on the blackboard on Sundays per the documented dates in the syllabus. Feedback to your submissions will be posted on the blackboard within 72 hours (96 hours for a class of 60 or more students) after the weekly submission due date and time. It means that if you chose to submit your assignment early, it will be graded at the scheduled time and not before. Work submitted after due date will receive a grade of zero. All assignments must conform to APA writing style and include a reference list (not a work cited or bibliography).

Students with extenuating circumstances, such as a medical emergency or other emergencies must provide written proof of such event, and report such events within 24 hours and make arrangement to complete assignments in a timely manner. Failure to do so will result in a penalty up to 50%. Make up examinations (if part of course) will only be offered at the discretion of the instructor.

Technology Initiatives:
Users of the Fitchburg State University computer systems are subject to all applicable federal, state, and international computer laws. Questions regarding regulations may be directed to the office of Information Technology Systems.

Students will utilize technology as:

- A research tool; (a means of discovering current trends and substantive research articles in education)
- A demonstrated laboratory activity
- A communication method
- An enhancement tool for the design of PowerPoint presentations (for recorded presentations-individual/group)

Fitchburg State University Library Online Services:

The Fitchburg State University Library online services may be accessed through the Fitchburg State University Homepage https://library.fitchburgstate.edu/. Students may access any of several full-text online databases. Passwords are available to students by calling 978.665.3063. Students may access the Fitchburg State University Career Service and Counseling Services Center via the college's homepage at https://www.fitchburgstate.edu/student-support/career-support/career-resources.

Disabilities Accommodation:
Students requiring course alterations or accommodations due to a disability or emergency medical condition, should inform instructor as soon as possible. You should also work with the Disability Services Office (978-665-4020). They will provide you with the forms needed to determine the particular accommodations that your situation merits.

University Academic Dishonesty Policy:
Fitchburg State University's policy on Academic Dishonesty will be enforced in this course. Please refer to the university catalog on this policy. Plagiarism and cheating are inexcusable. Any instance of plagiarism or cheating will result in lowered grade and possible failing the course.

Tentative Schedule:

Week	Topics	Remarks
Week 1	Introduction of Course	
Week 2	Construction Scheduling	
Week 3	Developing a Network Model, Precedence Diagrams,	*Homework 1 due*
Week 4	Determining Activity Durations	*Homework 2 due*
Week 5	Resource Allocation and Resource Leveling	*Quiz 1 due*
Week 6	Computer Scheduling	*Assign Final Project*
Week 7	Computer Scheduling	***Exam I due***
Week 8	4D, 5D, 6D	*Demonstrated Lab 1 due*
Week 9	Schedule Quality Metrics	*Homework 3 due*
Week 10	Project Monitoring and Control	
Week 11	Earned Value	*Homework 4 due*
Week 12	PERT: Program Evaluation and Review Technique	*Demonstrated Lab 2 due*
Week 13	Linear Scheduling	*Quiz 2 due*
Week 14	Project Week / Recorded Project Presentation	*Project Report & Presentation due*
Week 15	Final Exam	***Exam II due***

Note: The instructor reserves the right to modify this syllabus and schedule.