Request for Graduate Course Addition

1. Prepare one paper copy with all signatures and supporting material and forward to the Graduate Council Chair.
2. E-mail one identical PDF copy to the Graduate Council Chair. If attachments included, please merge into a single file.
3. **The Graduate Council cannot process this application until it has received both the PDF copy and the signed hard copy.**

College: CITE   Dept/Division: Engineering   Alpha Designator/Number: ME- 560   ⦿ Graded   ◯ CR/NC

Contact Person: Gang Chen   Phone: 696-3204

NEW COURSE DATA:

New Course Title: Automation and Control

Alpha Designator/Number: | M | E | 5 | 6 | 0 | | | | | |

Title Abbreviation: | A | u | t | o | m | a | t | i | o | n | | a | n | d | | C | o | n | t | r | o | l | | |

(Limit of 25 characters and spaces)

Course Catalog Description:
(Limit of 30 words)

This course provides an overview of the principles of automation and concept of system control, including instrumentation, control, human interface, and communication subsystems.

Co-requisite(s): None   First Term to be Offered: Spring-2016

Prerequisite(s): Graduate Status   Credit Hours: 3

Course(s) being deleted in place of this addition (*must submit course deletion form*):

Signatures: if disapproved at any level, do not sign. Return to previous signer with recommendation attached.

Dept. Chair/Division Head _____   Date _____

Registrar _____   Date _____

College Curriculum Chair _____   Date _____

Graduate Council Chair _____   Date _____

College: CITE   Department/Division: ENGINEERING   Alpha Designator/Number: ME-560

Provide complete information regarding the new course addition for each topic listed below. Before routing this form, a complete syllabus also must be attached addressing the items listed on the first page of this form.

1. FACULTY: Identify by name the faculty in your department/division who may teach this course.

Gang Chen

2. DUPLICATION: If a question of possible duplication occurs, attach a copy of the correspondence sent to the appropriate department(s) describing the proposal. Enter "**_Not Applicable_**" if not applicable.

Not Applicable

3. REQUIRED COURSE: If this course will be required by another deparment(s), identify it/them by name. Enter "**_Not Applicable_**" if not applicable.

None

4. AGREEMENTS: If there are any agreements required to provide clinical experiences, attach the details and the signed agreement. Enter "**_Not Applicable_**" if not applicable.

Not Applicable

5. ADDITIONAL RESOURCE REQUIREMENTS: If your department requires additional faculty, equipment, or specialized materials to teach this course, attach an estimate of the time and money required to secure these items. (Note: Approval of this form does not imply approval for additional resources.) Enter "**_Not Applicable_**" if not applicable.

None

6. COURSE OBJECTIVES: (May be submitted as a separate document)

Please refer to the attached syllabus

7. COURSE OUTLINE   (May be submitted as a separate document)

 Please refer to the attached Syllabus

8. SAMPLE TEXT(S) WITH AUTHOR(S) AND PUBLICATION DATES (May be submitted as a separate document)

 Industrial Automation and Process Control, Jon Stenerson, Springer, 2002
 Overview of Industrial Process Automation, K. L. S. Sharma, Elsevier, 2011
 Modern Control Engineering, K. Ogata, Prentice hall, 2010
 Any text on fundamental control engineering

9. EXAMPLE OF INSTRUCTIONAL METHODS (Lecture, lab, internship)

 Lecture

10. EXAMPLE EVALUATION METHODS (CHAPTER, MIDTERM, FINAL, PROJECTS, ETC.)

Mid-term exams 45%
HW & Projects: 25%
Final Exam: 30%

11. ADDITIONAL GRADUATE REQUIREMENTS IF LISTED AS AN UNDERGRADUATE/GRADUATE COURSE

None

12. PROVIDE COMPLETE BIBLIOGRAPHY   (May be submitted as a separate document)

Industrial Automation and Process Control, Jon Stenerson, Springer, 2002
Overview of Industrial Process Automation, K. L. S. Sharma, Elsevier, 2011
Modern Control Engineering, K. Ogata, Prentice hall, 2010
Any text on fundamental automation and control engineering
ASME Journal of Dynamical System, measurement and control

Request for Graduate Course Addition - Page 5

Please insert in the text box below your course summary information for the Graduate Council agenda. Please enter the information exactly in this way (including headings):

Department:
Course Number and Title:
Catalog Description:
Prerequisites:
First Term Offered:
Credit Hours:

Department: Weisberg Division of Engineering
Course Number and Title: ME 560 Automation and Control
Catalog Description:
This course provides an overview of the principles of automation and concept of system control, including instrumentation, control, human interface, and communication subsystems.

Prerequisite: Graduate status
First year Offered: Spring 2016
Credit Hours: 3

Marshall University
Syllabus

Course Title/Number	**Automation and Control, ME560**
Semester/Year	**Spring / 2016**
Days/Time	**MWF / 11:00 – 11:50 am**
Location	**Weisberg Engineering Lab 101 Classroom**
Instructor	**Gang Chen**
Office	**Weisberg Engineering Lab Room 109c** **Division of Engineering** **College of Information Technology and Engineering** **Marshall University** **Huntington, WV 25755**
Phone	**304-696-3204**
E-Mail	**chenga@marshall.edu**
Office/Hours	**MWF: 12:00-2:00pm** **For those of you who will not be able to meet the instructor during the assigned office hours, you are welcome to come and ask instructor by appointment or at an appropriate time.**
University Policies	**By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy be going to www.marshall.edu/academic-affairs and clicking on "Marshall University Policies." Or, you can access the policies directly by going to http://www.marshall.edu/academic-affairs/?page_id=802** **Academic Dishonesty/ Excused Absence Policy for Undergraduates/ Computing Services Acceptable Use/ Inclement Weather/ Dead Week/ Students with Disabilities/ Academic Forgiveness/ Academic Probation and Suspension/ Academic Rights and Responsibilities of Students/ Affirmative Action/ Sexual Harassment**

Catalog Course Description

This course provides an overview of the principles of automation and concept of system control, including instrumentation, control, human interface, and communication subsystems.

Table: How each student learning outcomes will be practiced and assessed in the course.

Course Student Learning Outcomes	How students will practice each outcome in this Course	How student achievement of each outcome will be assessed in this Course	Program outcomes

Students will be able to determine automation Characteristics	Lectures, In-class discussions, in-class excises, homeworks	Questions in class, the evaluations of homework and examination problems.	a2,e2
Students will be able to understand instrumentations and sensors	Lectures, In-class discussions, in-class excises, homeworks	Questions in class, the evaluations of homework and examination problems.	a2,e2
Students will be able to understand robotics, and control components	Lectures, In-class discussions, in-class excises, homeworks	Questions in class, the evaluations of homework and examination problems.	a2,e2
Students will be able to conduct process control analysis and PLC	Lectures, In-class discussions, in-class excises, homeworks	Questions in class, the evaluations of homework and examination problems.	a2,e2
Students will be able to solve differential Equations, Dynamic System Characteristics: Transient, Steady-state Frequency Response, System Identification, Signal Conditioning, Spectrum Analysis	Lectures, In-class discussions, in-class excises, homeworks	Questions in class, the evaluations of homework and examination problems.	a2,e2
Students will be able to get an introduction for Software and Data Acquisition, Computer based instrumentation, Signal Conditioning, Data recording and Logging, Amplifiers, input/Output Ports	Lectures, In-class discussions, in-class excises, homeworks	Questions in class, the evaluations of homework and examination problems.	a2,e2
Students will be able to design basic control: System Response-polar (Nyquist) Plot and Bode Diagrams	Lectures, In-class discussions, in-class excises, homeworks	Questions in class, the evaluations of homework and examination problems.	a2,e2
Students will be able to solve Open and Closed-Loop Control Systems, human interface, and	Lectures, In-class discussions, in-class excises, homeworks	Questions in class, the evaluations of homework and examination problems.	a2,e2

communication subsystems			

Objective:

After taking this course, students should be able to

- Understand the fundamentals of automation
- Select proper sensors, power control components.
- Conduct basic automation and control analysis
- Understand control concepts and basic control system (C,E,F, I or more)

Required Texts, Additional Reading, and Other Materials

Industrial Automation and Process Control, Jon Stenerson, 2002, Springer
Overview of Industrial Process Automation, K. L. S. Sharma, Elsevier, 2011
K. Ogata, "Modern Control Engineering, 2010, Prentice hall
Any text on fundamental control engineering

Course Requirements / Due Dates

Course Requirements : Attendance/Homework /Examinations

TEST SCHEDULE:
        Hourly Exam #1
        Hourly Exam #2
        Hourly Exam #3
        Final Exam   (two hours)
 	
Homework due Dates:
 	
✦ **Homework will regularly be assigned either during the class time or by e-mail/blackboard.**
✦ **Checking your e-mail is required on a daily-basis for information regarding homework assignment. Homework must be submitted before the starting time of class on the assignment date.**
✦ **Late homework is acceptable for an excused absence. For unexcused delay submission, there will be a 20% late penalty for each day it is late--starting with a 20% penalty on the first day if it is not turned in at the beginning of class. After 5 days, it will not be accepted at all.**
✦ **No late homework will be accepted after the final day of classes for the semester.**
✦ **You are expected to provide your homework on engineering papers - not a Xerox copy.**
✦ **Homework must be neat, readable, and must conform to acceptable Standards of Engineering Computation.**

Grading Policy

Exams:

> Three exams and a final exam will be given during the course of the semester. Exams will be closed book and closed notes. No makeup exams will be given with the exception of unusual circumstances (institutional excuse, severe injuries, family emergencies, group activities etc.).

Grading Policy:

Homework and Attendance	25% (attendance 10%)
Exam 1	15%
Exam 2	15%
Exam 3	15%
Final Exam	30%

Total	100%

Letter Grade Scale:

> 90-100--------- A
>
> 80- 89 --------- B
>
> 70-79 --------- C
>
> 60-69 --------- D
>
> 0-59 --------- F

The instructor does reserve the right to slightly curve or scale the grades based on class groupings/performance.

Attendance Policy

The attendance policy will follow University's excused absence policy.

You are expected to attend all classes. However, the instructor accepts your absence for one session provided that an advance notice will be given, unless this is an excused absence such as institutional excuse, severe injuries, family emergencies, group activities etc.

Course Schedule:

LECTURE SUBJECT Schedule & TEXT REFERENCE

- Introduction of industrial automation and control
- human interface, and communication subsystems
- Static Instrument Characteristics, sensors, control components.
- Solution of Differential Equations, Dynamic System Characteristics: Transient, Steady-state, Frequency Response, System Identification, Signal Conditioning, Spectrum Analysis
- Introduction to Software and Data Acquisition, Computer based instrumentation, Signal Conditioning, Data recording and Logging, Amplifiers, input/Output Ports
- Concept of control: System Response-polar (Nyquist) Plot and Bode Diagrams
- Open and Closed-Loop Control Systems, Sensitivity, Transient Response, Transfer functions, Stability of Linear Feedback Systems, Applications.

* The instructor reserves the right to slightly change the topics and their order to achieve the maximum benefit of the course learning outcomes.