A - New Course Proposal V. 7.2022 : Entry # 3085

DEAN Decision

Approved

Date

09/18/2023

Is this course intracollegiate or intercollegiate?

Intracollegiate

DEAN Comments

Introducing 3 new programs: Mechanical, Mechatronic and General Engineering.

SCHOOL EPC Decision

Approved

Date

10/03/2023

Begin Form

Today's Date

09/17/2023

Your Name:

Michael Oudshoorn

Your Email:

moudshoo@highpoint.edu

Are you a Department Chair?

Yes

By checking below, I certify that my department chair has seen and approved the new course that I am proposing.

Yes

Please select the appropriate school overseeing this proposal:

Engineering

Information for the Registrar

Choose the department designator from the list below.

MME

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Proposed Course Number?

3300

Is this course cross listed?

No

Does this course replace a current course?

No

What is the title of the new course?

Control of Mechanical Systems

Write the catalog description of your proposed course:

Theory, analysis and design of control systems, including mechanical, electromechanical, hydraulic, pneumatic and thermal components and systems.

How many credit hours will this course be?

4

How will the course be graded?

Letter grade

Please select the course repeat option for this course:

Not repeatable for credit

What is the offering cycle for this course?

Fall semester

Does your course have any prerequisites?

Yes

Please list all prerequisites this course requires:

MME2200 Dynamics and MTH2050 Mathematical Models for Engineering I and MME1015 Programming in MATLAB

Is this new course being proposed because of a new or revised major or minor proposal?

Majors:
Mechanical Engineering
Mechatronic Engineering
General Engineering

Submitted by:
Michael Oudshoorn

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Submission date:
9/17/2023

Gen Ed and Academic Programs

Is this course part of Gen Ed?

- No

Does this course count towards a major or a minor?

Yes

Please list the Major / Minor and if it is Required or Elective

Required: Mechanical/Mechatronic Engineering; Elective: General Engineering

Is this course part of an academic program?

- This course does not fulfill academic program requirements

Does this course include any community engagement?

No

Does this course participate in the GoGlobal Program?

No

Information for Curriculum Review

Rationale and evidence for new course's consistency with departmental mission:

This course matches and supports the departmental/program mission by providing students with the necessary background in mechanical engineering in support of the newly proposed programs in Mechanical, Mechatronic and General Engineering. To achieve ABET accreditation for these programs, students must be exposed to breadth and depth within the discipline. All courses either provide foundational content upon which the depth will be built, or provide the depth by utilizing earlier courses. The courses provide students with in-demand skills and knowledge that will prepare them for the workforce.

List all student learning outcomes for this course.

By the end of this course, you should be able to do the following:
• Write differential equations describing the behavior of engineering systems.
• Use the Laplace transform to describe the transfer function of engineering systems and
• determine the time domain response to a wide range of inputs.
• Use state-variable equations to model engineering systems and determine their time
• response to a wide range of inputs.
• Describe the advantages of feedback control.
• Analyze the performance of control systems.
• Determine the stability of control systems using root locus and Bode methods.
• Design feedback control systems using frequency domain, root locus and state-variable methods.

List any units or content areas that will be required for all sections of this course.

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Linearity, linearization, linear systems
Laplace transforms
Transfer functions and block diagrams
Impulse response
First-order systems
Second-order systems
Poles, zeros, and stability
Peak/rise/settling time, initial/final value theorem
Reference tracking, system types
PID control
Routh-Hurwitz stability criterion
Root locis introduction and rules
Introduction to Bode plots
Converting Bode plots to Transfer functions
Gain and Phase margin
Nyquist plots and Nyquist criterion
Introduction to state space methods
Eigenvalues and stability
Controllability

List any assignments, tests, or other assessments that will be required for all sections of this course.

May vary

List any readings or other materials that will be required for all sections of this course.

May vary

List any course policies that will be required for all sections of this course.

May vary

If you would like to specify how requirements for contact hours must be met for all sections of this course, please indicate below. (e.g., if any experiential learning activities will replace seat time)

3 hours of lecture per week
2 hours of lab per week

Sample Syllabus

- MME3300-Contol-of-Mechanical-Systems.pdf