

A - New Course Proposal V. 7.2022 : Entry # 3103**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

Which semester is this course to be taught for the first time?

Spring 2027

Information for the Registrar

A - New Course Proposal V. 7.2022 : Entry # 3103**Choose the department designator from the list below.**

MME

Proposed Course Number?

4500

Is this course cross listed?

No

Does this course replace a current course?

No

What is the title of the new course?

Robotics

Write the catalog description of your proposed course:

Robotics is in a period of rapid growth. This course will cover the fundamentals of modeling, perception, planning, and control, that you need to enter the field confidently. This course will introduce you to standard modeling and control techniques as well as modern ways of thinking about robotics that are rooted in engineering and physics. Consistent with these ways of thinking, this course will place a strong emphasis on fundamentals.

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?

Spring semester

Does your course have any prerequisites?

Yes

Please list all prerequisites this course requires:

MTH2310 Linear Algebra or STS3005 Probability and Statistics for Engineers, and MME/ECE 1015 Programming in MATLAB and CSC1720 Advanced Programming and Data Structures and MME3300 Control of Mechanical Systems

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

Majors:
Mechatronic Engineering

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General Engineering

Submitted by:

Michael Oudshoorn

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: 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 the course, you should be able to:

1. Use Python, MATLAB and C++ to compute the position and orientation of the robot end-effector from the robot joint variables and vice versa.
2. Program robot motion.
3. Simulate robots with 3D graphics.

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

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Introduction
Actuators and Drives
Control components
Embedded robot controller, I/O interface and PWM Amplifiers
Control software
Sensors and sensor inputs
Kinematics
Differential motion
Statics, energy method
Legger robots, multi-fingered hands
Computer torque control
Navigation

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

- [MME4500-Robotics.pdf](#)