A - New Course Proposal V. 7.2022 : Entry # 3088

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

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Choose the department designator from the list below.

MME

Proposed Course Number?

3400

Is this course cross listed?

No

Does this course replace a current course?

No

What is the title of the new course?

Vibrations

Write the catalog description of your proposed course:

One- and multi-degree-of-freedom systems. Natural frequencies and modes of vibrations, resonance, beat phenomenon. Stability analysis. Energy methods. Applications to rotating machinery. Methods for vibration reduction.

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:

MME2200 Dynamics and MME/ECE1015 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

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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: 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.

Upon completion of the course students shall be able to:
• Derive the equations of motion for vibratory systems.
• Linearize nonlinear systems so as to allow a linear vibrational analysis.
• Compute the natural frequency (or frequencies) of vibratory systems and determine the system's modal response.
• Determine the overall response based upon the initial conditions and/or steady forcing input.
• Design a passive vibration absorber to ameliorate vibrations in a forced system.

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

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Basic Concepts of Vibration
Classification of Vibration
Vibration Analysis Procedure
Spring Elements
Mass or Inertia Elements
Damping Elements
Harmonic Motion
Introduction to Free Vibration of Single-Degree-of-Freedom Systems
Response of First-Order Systems and Time Constant
Rayleigh's Energy Method
Free Vibration with Viscous Damping
Introduction to Harmonically Excited Vibration
Equation of Motion
Forced Vibration
Self-Excitation and Stability Analysis
Convolution Integral
Laplace Transforms
Introduction to Two DOF Systems

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

- MME3400-Vibrations.pdf