Students are advised to keep course outlines in personal files for future use.

Shaded headings are subject to change at the discretion of the department and the material will
+ see course syllabus available from instructor

FACULTY/DEPARTMENT: Faculty of Science, Health & Human Services/Physics

COURSE NAME/NUMBER       FORMER COURSE NUMBER     UCFV CREDITS
ENGR 113 PHYSICS 113       PHYSICS 113               4

COURSE DESCRIPTIVE TITLE
Engineering Physics - Statics & Dynamics

CALENDAR DESCRIPTION:
This course is specifically designed for students who wish to pursue a career in engineering. The emphasis of this course will be on solving realistic problems. In place of the normal laboratory period, a weekly problem-solving and tutorial period is used to sharpen problem-solving skills. Topics include Newton’s laws, kinematics, statics, and dynamics for particles and systems of particles, static and rotational equilibrium, analysis of structures, planar motion of rigid bodies, energy and momentum conservation.

PREREQUISITE
Physics 111; Math 111

SYNONYMOUS COURSE(S)
(a) Replaces: PHYSICS 113
    (Course #)
(b) Cannot take PHYSICS 113 for further credit.
    (Course #)

SERVICE COURSE TO:
Physics/Engineering Transfer Program

TOTAL HOURS PER TERM: 90
TRAINING DAY-BASED INSTRUCTION
LEC 45 Hrs
SEM 45 Hrs
LAB 0 Hrs
FE 0 Hrs
SD 0 Hrs
OT 0 Hrs

MAXIMUM ENROLLMENT: 36
EXPECTED FREQUENCY OF COURSE OFFERINGS: Once/year, possibly twice

WILL TRANSFER CREDIT BE REQUESTED? (lower-level courses only)
□ Yes □ No

WILL TRANSFER CREDIT BE REQUESTED? (upper-level requested by department)
□ Yes □ No

TRANSFER CREDIT EXISTS IN BCCAT TRANSFER GUIDE:
☒ Yes □ No

COURSE IMPLEMENTATION DATE: September 1999
COURSE REVISED IMPLEMENTATION DATE: September 2006
COURSE TO BE REVIEWED: November 2009
(4 years after UPAC final approval date)

UPAC Approval in Principle Date: December 14, 2005
LEARNING OBJECTIVES / GOALS / OUTCOMES / LEARNING OUTCOMES:
The student will:
- gain a thorough grasp of Newtonian mechanics, using the technique of free body diagrams
- develop a feel for the order of magnitude of mechanical qualities in realistic situations
- improve his or her problem-solving skills by doing a large number of problems
- gain a taste for the emphasis on computation required for engineering analysis
- learn the standard format for engineering solutions
- be able to solve various problems in each of the topic areas listed in the Calendar Description section

METHODS:
The course will be presented using lectures and tutorials. Approximately ten problems per week will be handed in and marked. During the tutorial the marked assignments will be discussed, additional problems in the same general area will be dealt with, and help will be given for those needing it for the next assignment set. There will be a close coordination between the lecture topics and the tutorials.

PRIOR LEARNING ASSESSMENT RECOGNITION (PLAR):
Credit can be awarded for this course through PLAR (Please check :) ☒ Yes ☐ No

METHODS OF OBTAINING PLAR:
Departmental Review and/or Course Challenge

TEXTBOOKS, REFERENCES, MATERIALS:
[Textbook selection varies by instructor. An example of texts for this course might be:]

SUPPLIES / MATERIALS:
Engineering Grade Paper and simple drawing instruments

STUDENT EVALUATION:
[An example of student evaluation for this course might be:]
Assignments 15%
Midterm 30%
Final exam 55%

COURSE CONTENT:
[Course content varies by instructor. An example of course content might be:]

<table>
<thead>
<tr>
<th>WEEK</th>
<th>TOPIC</th>
<th>TEXT</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Introduction to mechanics, fundamental concepts and principles, systems of units, solution methods and numerical accuracy. Vectors.</td>
<td>Ch 1, 1.1 – 1.6</td>
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<tr>
<td>2-2.5</td>
<td>Newton’s laws, forces as vectors, free body diagrams and Equilibrium of</td>
<td>Ch 3, 3.1 – 3.4</td>
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<tr>
<td>2.5-3</td>
<td>Rigid body equilibrium, torques as vector cross products, equivalent forces and couples. Loadings and distributed forces</td>
<td>Ch 4, 4.1 – 4.5</td>
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<td>4</td>
<td>Rigid body equilibrium in two and three dimensions</td>
<td>Ch 5, 5.1 – 5.7</td>
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<td>5</td>
<td>Analysis of structures (trusses and frames)</td>
<td>Ch 6, 6.1 – 6.4</td>
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<td>6</td>
<td>Friction-wedges, square threaded screws, journal bearings, thrust bearings, rolling resistance, belt friction.</td>
<td>Ch 8, 8.1 – 8.3</td>
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<td>7</td>
<td>Virtual Work, Conservative Forces and Potentials</td>
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<tr>
<td>8 – 9</td>
<td>Particle kinematics – rectilinear and curvilinear motion (radial and tangential components)</td>
<td>Ch 11, 11.1 – 11.7</td>
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<tr>
<td>10</td>
<td>Newton’s second law, linear and angular momentum, Central force problems</td>
<td>Ch 12, 12.1 – 12.9</td>
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<td>#</td>
<td>Topic</td>
<td>Chapter(s)</td>
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<tr>
<td>11</td>
<td>Energy and Momentum conservation – work-kinetic energy theorem,</td>
<td>Ch 13, 13.1 – 13.7</td>
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<td>momentum-impulse theorem, conservative forces</td>
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<tr>
<td>12</td>
<td>Systems of particles, work and energy,</td>
<td>Ch 14 pp. 655-729</td>
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<tr>
<td></td>
<td>momentum and angular momentum</td>
<td>14.1 – 14.6</td>
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<tr>
<td>13</td>
<td>Systems of particles, Momentum and Impulse, Angular Momentum and</td>
<td>Ch 15, 15.1 – 15.7</td>
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<td>Angular Impulse</td>
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