

## **ENGR 3125 – Machine Dynamics & Vibrations**

*Instructor: Muhammad Salman*

**Kennesaw State University ENGR 3125 -  
Machine Dynamics & Vibrations Course  
Syllabus –Spring 2015**

**Instructor:** **Muhammad Salman (Ph.D.)**, *Assistant Professor, Mechanical Engineering*

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**Class times:** TR 1:00pm – 2:15 pm

**Office Hours:** *Monday* *Thursday*  
*10:00 am -12:00 pm* *12:00 pm -1:00 pm*  
By appointment or Walk in

**Text Book:** **Dynamics and Vibrations, An introduction, Revised First Edition**, by Magd Abdel Wahab, Wiley (2008) ISBN 978-0-470-72300-5

### **Prerequisite:**

ENGR 2214, MATH 2254

### **Grades:**

HW plus Class Participation: 15%  
2 Quizzes: 25%  
Test 1: 20%  
Test 2: 20%  
FINAL Test: 20% (Non-CUMMULATIVE)

### **Grading:**

[90 - 100% = A, 80 - 89% = B 70 - 79% = C 60 - 69% = D Below 60% = F]

Homework assignments will be assigned after certain modules have been completed. The format for the tests and the exams will be proctored and will be announced well before each test and exam.

- Late homework and reports will NOT be accepted for credit. Work turned in late may be evaluated to provide you with feedback, but will not be graded / given credit except in cases of emergency.

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- Electronic submission of Homeworks is encouraged also bring the stapled HWs in the class as well.
- Show all your work for full credit! Write your name on every page. Present your work neatly!

### **ADA/504 Compliance**

Students with disabilities who believe that they may need accommodations in this class are encouraged to contact the ATTIC counselor working with disabilities at (678) 915-7361 as soon as possible to better ensure that such accommodations are implemented in a timely fashion.

### **Class Attendance Policy:**

*“ ... The instructor may reduce the course grade of any student who fails to meet the attendance requirements as set forth in the instructor’s attendance policy. Students should understand they are responsible for all course material covered and that they are responsible for the academic consequences of their absences.”*  
(SPSU Student’s handbook)

### **Honor Code**

SPSU has an Honor Code and a new procedure relating to when academic misconduct is alleged. All students should be aware of them. Information about the Honor Code and the misconduct procedure may be found at <http://spsu.edu/honorcode/>.

### **Weekly Schedule**

| <b>Week</b> | <b>Name of Module</b>                                     | <b>Comment</b>                             |
|-------------|---|--|
| <b>1</b>    | Kinematics of Particle                                    | Some Definitions—Ch-1                      |
| <b>2</b>    | Curvilinear motion + Quiz -1                              | Polar and n-t coordinate Systems--<br>Ch-1 |
| <b>3</b>    | Free Vibration—1DOF                                       | Equivalent spring stiffness—Ch 6           |
| <b>4</b>    | Damping in a 1-DOF systems,<br>Torsional Vibration        | Ch 6                                       |
| <b>5</b>    | Forced Vibration in 1DOF +<br>Rotational un-balance force | Ch 7                                       |
| <b>6</b>    | Vibration Isolation +Quiz 2                               | Ch 7                                       |

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|           |  |  |
|-----------|--|--|
| <b>7</b>  | 2-DOF Vibration—Torsional                                  | Natural Frequencies & Modes of Vibration—Ch-8                          |
| <b>8</b>  | Vibration absorbers +Test 2                                | Ch-8   |
| <b>9</b>  | Kinematics of Rigid Bodies,                                | Fixed axis, rotation—wheels & gears, Gear Ratio calculations-- Ch-3    |
| <b>10</b> | Kinematics of Linkages- 4-bar mechanism, Grashof Condition | Ch-3   |
| <b>11</b> | Graphical + Test 1   | Calculation of instantaneous velocity & acceleration-- Ch-3 + Mobility |
| <b>12</b> | Kinetics of Particles                                      | Force—Acceleration, Energy Method- Ch-2                                |
| <b>13</b> | Kinetics of Particles                                      | Energy Method and Impulse and Momentum--Ch-2                           |
| <b>14</b> | Kinetics of Rigid Bodies                                   | Force—Acceleration, Energy Method and Impulse and Momentum--Ch-4       |
| <b>15</b> | Kinetics of Rigid Bodies                                   | Force—Acceleration, Energy Method and Impulse and Momentum--Ch-4       |
| <b>16</b> | Final Exam week  |  |

Note that the Instructor may change the schedule any time. See D2L (Desire 2 Learn) for updates. See *Reading and Homework Assignments* document for specific homework problems that may be collected for grading and their due dates.