

**MIAMI UNIVERSITY**  
School of Engineering and Applied Science  
Department of Engineering Technology

<b>ENT 301</b>	<b>Dynamics</b>	<b>3</b>
<b>Course Number</b>	<b>Title</b>	<b>Credit Hours</b>

**PREREQUISITES BY COURSE:**

ENT 271 Mechanics I: Statics and MTH 151 Calculus I

**DESCRIPTION**

The basic concepts of force, mass, and acceleration; work and energy; and impulse and momentum are introduced and applied to problems involving particles and rigid bodies.

Periods per week: 2 Lectures, 1 Laboratory

**GENERAL OBJECTIVES**

The student will demonstrate an understanding of the mechanics of accelerating bodies by analyzing and solving problems relating to typical engineering applications and case studies.

**TOPICAL OUTLINE : Fall 2007**

20 Aug 07 : Ch. 10 : Kinematics  
27 Aug 07: Ch. 10 : Kinematics Problem-Solving : Working Model  
03 Sep 07 : LABOR DAY HOLIDAY  
10 Sep 04 : Ch. 10 : Kinematics : Rectilinear motion : Working Model  
27 Sep 04 : Ch. 11 : Kinematics : Angular motion : Problem Solving  
01 Oct 07 : Ch. 11 : Kinematics : Angular motion : Working Model  
08 Oct 07 : Ch. 12 : Plane Motion : Problem Solving. **MID TERM**  
15 Oct 07 : Working Model Exercises  
22 Oct 07 : Ch. 13 : Kinetics : Problem Solving  
29 Oct 07 : Ch. 13 : Kinetics : Working Model  
05 Nov 07 : Ch. 14 : Work, Energy & Power : Problem Solving  
12 Nov 07 : Ch. 14 : Work, Energy & Power : Working Model  
19 Nov 07 : Problem Solving & Working Model  
26 Nov 07: Ch. 15 : Impulse & Momentum : Problem Solving  
03 Dec 07 : Ch. 15 : Impulse & Momentum : Working Model  
10Dec 07 : **FINAL EXAM**

**TEXT and METHOD OF PRESENTATION**

Keith M. Walker : *Applied Mechanics for Engineering Technology*. 7<sup>th</sup> Edition (2004).

New Jersey : Prentice Hall. Lecture, problem solving, and related computer software projects will be used to accomplish the above objectives. Students need to bring their fully organized course portfolio from ENT 271: STATICS. The subject matter discussed in Dynamics builds on the knowledge gained in Statics.

#### **METHOD OF EVALUATION**

The student will be evaluated on class participation, performance on quizzes, homework, computer projects, and final exam.

Homework	10%	Mid-Term	40%
Working Model	10%	FINAL	40%

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**TEXT MATERIAL:**

Walker, Keith M, Applied Mechanics for Engineering Technology, 7<sup>th</sup> Edition, Prentice Hall, 2004.

**LIST OF HOMEWORK PROBLEMS FOR THE PORTFOLIO :**

CHAPTER # 9	45, 47, 50
CHAPTER # 10	1, 5, 9, 10, 14, 17, 24, 28, 29, 33, 37, 40, 41, 44
CHAPTER # 11	7, 8, 12, 15, 20, 21, 24, 26, 30, 31, 34, 42, 46, 59, 60
CHAPTER # 12	6, 8, 9, 14, 16, 23, 26, 27, 28, 37, 39, 42, 61, 62
CHAPTER # 13	4, 13, 16, 24, 27, 34, 38, 40, 41, 47, 49, 50, 58, 61, 62
CHAPTER # 14	6, 9, 20, 23, 26, 27, 35, 37, 43, 50, 59, 62, 68, 75, 78, 86, 96, 98, 99

**SUGGESTED/RECOMMENDED ADDITIONAL COMPUTER LAB ASSIGNMENTS USING WORKING MODEL SOFTWARE :**

Chapter # 11 : 31, 32, 42

Chapter # 13 : 4, 16, 27, 34, 47

Chapter # 14 : 20, 23, 37, 51

<http://www.sciencejoywagon.com/physicszone/lesson/04torque/torq/torque.htm>

<http://www.sciencejoywagon.com/physicszone/lesson/01motion/projecti/default.htm>

Mysore Narayanan : Homework Problem Set suggested by Professor Ron Earley

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**PORTFOLIO :** Students are required to maintain a chronological “student-portfolio” of the course curriculum content. Final examination shall include a complete review of the “student-portfolio”. It is suggested that each numbered item be separated using index dividers. Title them according to the topic. (Example : ‘Kinematics’ instead of CH # 10) The “student-portfolio” shall include :

1. Syllabus and other relevant material.
2. Review of Ch. #9 Theory and relevant, completed homework assignments.
3. Review of Other appropriate, relevant, completed homework assignments.
4. Review of Mathematics and relevant, completed homework assignments.
5. CH # 10 : Kinematics : Rectilinear Motion.
6. CH # 11 : Kinematics : Angular Motion.
- ..... ETC. ( The above pattern repeats for the other chapters.)
7. Research Reports or Laboratory Assignments : Include the following :
  - (a) Instructions and appropriate handouts
  - (b) Circuit Diagram or Free Body Diagram
  - (c) Obtained data in tabular form
  - (d) Recorded results : Excel
  - (e) Sample calculations
  - (f) Graphs
  - (g) Analyses
  - (h) Conclusions
  - (i) Answers to the questions
  - (j) Web-search results
  - (k) References and any other material as appropriate.
8. Project Assignments : Follow the same pattern as in #7 above.
9. Instructor’s handouts that were not included previously.
10. Any other material deemed appropriate and relevant to the course.