

Module (Course Syllabus) Catalogue

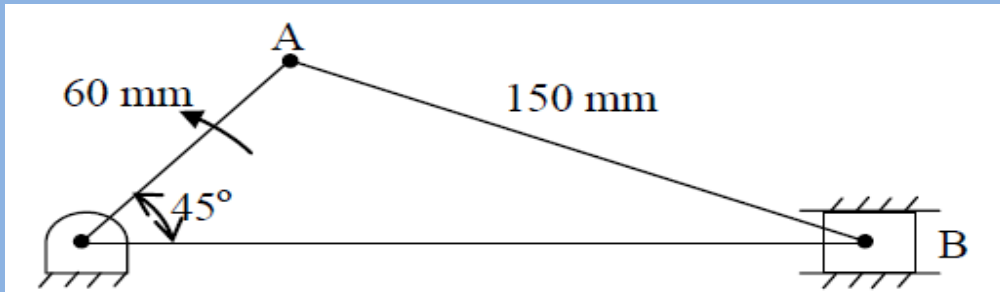
2023-2024

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|--------------------------|--|--------------------------|
| College/ Institute | Erbil Technical Engineering | |
| Department | Technical Mechanical and Energy Eng. | |
| Module Name | Theory of Machines | |
| Module Code | THM503 | |
| Degree | Technical Diploma <input type="checkbox"/> Bachler <input checked="" type="checkbox"/> High Diploma <input type="checkbox"/> Master <input type="checkbox"/> PhD <input type="checkbox"/> | |
| Semester | 5 | |
| Qualification | PhD in Mechanical Engineering | |
| Scientific Title | Lecturer | |
| ECTS (Credits) | 5 | |
| Module type | Prerequisite <input type="checkbox"/> Core <input checked="" type="checkbox"/> Assist. <input type="checkbox"/> | |
| Weekly hours | 4 | |
| Weekly hours (Theory) | (2)hr Class | (24)Total hrs Workload |
| Weekly hours (Practical) | (2)hr Class | (24)Total hrs Workload |
| Number of Weeks | 12 | |
| Lecturer (Theory) | ABDULRAHMAN BAHADDIN SHAKIR | |
| E-Mail & Mobile NO. | abdulrahman.shakir@epu.edu.iq , 07504748599 | |
| Lecturer (Practical) | ABDULRAHMAN BAHADDIN SHAKIR | |
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| Websites | | |

Course Book

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|---|---|------------------------------|------------------------|---|--|
| <p>Course Description</p> | <p>Theory of machines subject focuses on the fundamentals and principles of basic mechanical elements, failure theories and design criteria, and structures of basic mechanical systems. The goal of the course is to learn how to design simple mechanical elements and systems. Theory of machines includes:</p> <ul style="list-style-type: none"> • Understanding the principle of each element. • Analyzing elements mechanically by applying the theories from statics, dynamics, mechanics of materials, and fluid mechanics with deterministic or statistic approaches. • Learning how to design basic elements and simple systems. • Designing elements and systems by means of CAD. | | | | |
| <p>Course objectives</p> | <p>(Theory of machines course) aims are using prior knowledge taught in previous subjects, working the capabilities of engineering and making it attractive and useful for students, willing or not to opt for a mechanical profile. To sensitize the students about the relationship between technology and society by analysing the role of machines in this binomial and the sustainability of the current model of human activity</p> | | | | |
| <p>Student's obligation</p> | <p>Student's obligation In the Theory of machines course is:</p> <ul style="list-style-type: none"> • Attendance in the all lectures. • One or more quizzes in each course. • Attendance in practical hour in theory of machines lab. • Exam in end of first course • Practical exam at end of all courses. | | | | |
| <p>Required Learning Materials</p> | <ul style="list-style-type: none"> ➤ Datashow, and PowerPoint program in teaching in computer hall. ➤ White board . ➤ Web site to upload all lecture notes . | | | | |
| <p>Evaluation</p> | <p>Task</p> | <p>Weight (Marks)</p> | <p>Due Week</p> | <p>Relevant Learning Outcome</p> | |
| | <p>Paper Review</p> | | | | |
| | <p>Assignments</p> | <p>Homework</p> | <p>5</p> | | |
| | | <p>Class Activity</p> | <p>2</p> | | |
| | | <p>Report</p> | | | |
| | | <p>Seminar</p> | <p>5</p> | | |
| <p>Essay</p> | | | | | |

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|---|--|-------------|-------------------------|--|
| | Project | 5 | | |
| | Quiz | 8 | | |
| | Lab. | 10 | | |
| | Midterm Exam | 25 | | |
| | Final Exam | 40 | | |
| | Total | 100 | | |
| Specific learning outcome: | <p>(Theory of machines course) Students combine theory, graphical and analytical skills to understand the Engineering Design. Upon successful completion of the course, the student will be able:</p> <ol style="list-style-type: none"> 1- To develop the ability to analyze and understand the dynamic (position, velocity, acceleration, force and torque) characteristics of mechanisms such as linkages and cams. 2- To develop the ability to systematically design and optimize mechanisms to perform a specified task. 3- To increase the ability of students to effectively present written, oral, and graphical solutions to design problems. 4- To increase the ability of students to work cooperatively on teams in the development of mechanism designs. | | | |
| Course References: | <p>Key reference:</p> <ul style="list-style-type: none"> • Theory of Machines by R.S.KHURMI <p>Useful Reference:</p> <ul style="list-style-type: none"> • Theory of Machines by S.S.RATTEN | | | |
| Course topics (Theory) | | Week | Learning Outcome | |
| Introduction, Basic Definitions and concepts. | | 1 | | |
| Velocity Analysis in Mechanisms | | 2-3 | | |
| Acceleration Analysis in Mechanisms | | 4-5 | | |
| Friction, Belt or Ropes and chain drives | | 6-7 | | |
| Clutches | | 8-10 | | |
| Gear | | 11-12 | | |
| Flywheels | | 13 | | |



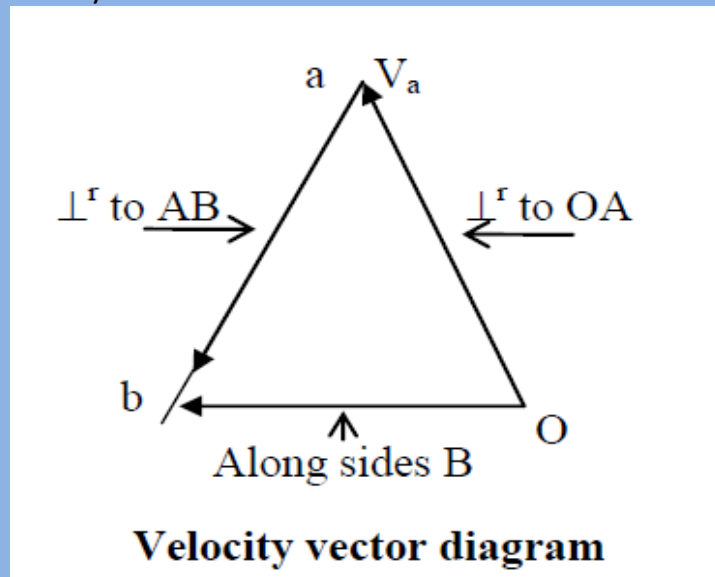
Configuration diagram

Step 1: Determine the magnitude and velocity of point A with respect to O,

$$V_A = \omega_{O1A} \times O_{2A} = \frac{2\pi \times 300}{60} \times 60$$

$$= 600\pi \text{ mm/sec}$$

Step 2: Choose a suitable draw velocity vector



scale to diagram

$$V_{ab} = \overline{ab} = 1300 \text{ mm/sec}$$

$$\omega_{ba} = \frac{V_{ab}}{BA} = \frac{1300}{150} = 8.66 \text{ rad/sec}$$

$$V_b = \overline{ob} \text{ velocity of slider}$$

Note: Velocity of slider is along the line of sliding.

Extra notes:

External Evaluator

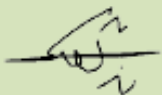
This module catalogue is well organised, covered a wide range of assignment methods which makes it sufficient for students' understanding and knowledge.

1- The course objective is quite clear. It meets the standard requirement for engineering competences by international mechanical engineering organisations; for example, Institute of Mechanical Engineers (IMechE) -the UK.

2- The references are up to dated references.

3- All course topics included in this catalogue is essential for further understanding of Mechanical Engineering and practise them during engineering projects.

Hereby, I confirm that this module catalogue is extremely useful and sufficient in terms of scope and quality for the third-year students in the Department of Mechanical and Energy Engineering at Erbil Polytechnic University.



Dr. Zhwan Dilshad Ibrahim
05/09/2022