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## SYLLABUS

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<b>Date/ Revision</b>	05 August 2015 / Rev.01
<b>Faculty</b>	Engineering and Lifesciences
<b>Approval</b>	Dean of Engineering Faculty

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### SUBJECT : PHYSICS LABORATORY 1

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#### 1. Identification of Subject:

Name of Subject	: Physics Laboratory 1
Code of Subject	: PHYS-1210
SKS	: 1
Semester	: 1
Study Program	: AVE/ELE/MTE/MEE/INE & FTE/BME/CHE
Lecturer	:

#### 2. Competency

After having the course, students are able to:

- explain the procedure in using of a laboratory and safety policy;
- demonstrate the correct measurement in the Laboratory;
- take data measurement and analyse the data and apply error propagation concept;
- write the scientific report of experiment correctly based on the scientific report policy;
- Develop skills in collecting and managing data in order to express their results in a precise and reliable quantitative or qualitative form on lab reports
- Develop teamwork skills that include not only the efficient acquisition of experimental data but also the awareness of safety in the laboratory setting

#### 3. Description of Subject:

The Physics Laboratory of semester one is designed to give students a background in basic experimental techniques and to reinforce instruction in physical principles in the companion courses. These techniques and principles are quite general and applicable to aspects of all sciences. Materials chosen are mainly the **mechanics** topics from the physics course.

#### 4. Learning Approach

Approach	: Combination of Expository - inquiry and collaborative
Method	: Laboratory activities to execute the experiments
Student Task	: Doing the Pre-Lab Task, Executing the Experiments, Taking- and Analysing of Data, writing the reports.
Media	: LCD projector, Experiment modules.

## 5. Evaluation

Absence maximum	: 25%
Prelab	: 10 points
Laboratory Report	: 30 points
Final Examination	: 60 points
<b>Total</b>	<b>: 100 points</b>

## 6. Contents/ Topics of Lecturing:

Week	Content/ Topics of Lecturing	Text Book Chapter	Remark
1-2	<b>Physics 1 Lecturing in the Class</b>		
3	<b>Lab Procedure and Safety Policy:</b> <ul style="list-style-type: none"> <li>• Health and Safety Mission Statement</li> <li>• University Health and Safety Policy</li> <li>▪ Emergency Procedures: Fire, Accidents, and Security</li> <li>▪ General Rules: Occupation of Buildings, Laboratory Discipline</li> <li>▪ Out of Hours Access: General Rules, Laboratory Access</li> </ul>	Handout	
4	<b>MEC-01: Measuring Length</b> <ul style="list-style-type: none"> <li>▪ Measuring with Vernier Calipers,</li> <li>▪ Measuring with Micrometer-Screw, and</li> <li>▪ Measuring with Spherometer</li> </ul>	Handout MEC-01	
5	<b>MEC-02: Static Effects of Forces</b> <ul style="list-style-type: none"> <li>▪ Expansion of a helical spring,</li> <li>▪ Bending of a leaf spring</li> </ul>	Handout MEC-02	
6-7	<b>MEC-03: One Dimensional motion on Fletcher's trolley</b> <ul style="list-style-type: none"> <li>▪ Path-time diagram of straight motion - Recording and evaluating with CASSY and VideoCom</li> <li>▪ Newton's third law and laws of collision - Recording and evaluating with VideoCom and CASSY</li> </ul>	Handout MEC-03	
8	<b>MIDTERM SEMESTER BREAK</b>		
9-10	<b>MEC-05: Rotational Motions</b> <ul style="list-style-type: none"> <li>▪ Path-time diagrams of rotational motions - Recording and evaluating with CASSY</li> <li>▪ Conservation of angular momentum</li> <li>▪ Conservation of angular momentum in elastic rotational collision</li> <li>▪ Conservation of angular momentum in inelastic rotational collision</li> </ul>	Handout MEC-05	

11-12	<b>MEC-06: Oscillation</b> <ul style="list-style-type: none"> <li>▪ Free rotational oscillations - Recording with CASSY</li> <li>▪ Forced harmonic and chaotic rotational oscillations - Recording with CASSY</li> </ul>	Handout MEC-06	
13	<b>MEC-07: Wave Mechanics</b> <ul style="list-style-type: none"> <li>▪ Standing transversal waves on a thread</li> <li>▪ Standing longitudinal waves on a helical spring</li> </ul>	Handout MEC-07	
14	Review and Discussion		
15	Review and Discussion		
16	<b>Final Examination</b>		

## 7. Book Reference:

- a) "Principles of Physics 10th Edition", **Authors:** Halliday, Resnick, and Walker, **Publisher:** John Wiley & Son Inc.; **ISBN:** 978-1-118-23072-5
- b) "University Physics Experiments", Author: Becker / Jodl, Publisher Leybold Didactic GmbH - Germany, 1992
- c) "Physics for Scientists and Engineers 9th Edition", Author: Serway Jewett, Publisher: Thomson Brooks/Cole; ISBN: 978-1133947271
- d) "General Physics", Author: D.C. Giancoli, **Publisher:** Prentice Hall Inc; ISBN: 978-0133509847