

TEACHER'S GUIDE SHEET

MODULE	FOUNDATIONS OF BIOMECHANICS APPLIED TO THE LOCOMOTOR SYSTEM
DIDACTIC UNIT	<p>D: TECHNIQUES FOR THE INSTRUMENTAL ANALYSIS OF MOVEMENTS AND FORCES</p> <p>D.1: How can movements be measured and which parameters can be analyzed? What are its main applications?</p>
TITLE OF ACTIVITY/CLASS	<ul style="list-style-type: none"> Measuring Movement
OBJECTIVES	<ul style="list-style-type: none"> Find out which are the main techniques for instrumental analysis of movement, their main characteristics and their fields of application. Work on the instrumental study of movement in activities and/or gestures. Work on the proposal of a movement study, its scope, objectives and most appropriate instrumental technique.
LENGTH	150' OF CLASS MATERIAL IN TOTAL, including the 2 Workshops proposed.
PREVIOUS KNOWLEDGE REQUIRED	<p>Not needed in case of Workshop 1.</p> <p>In order to prepare Workshop 2, the student should revise in advance the pdf document associated to this didactic unit (D.1): How can movements be measured and which parameters can be analyzed? What are its main applications? (Autonomous work section).</p>
TECHNICAL NEEDS	<p>PC with software for the reproduction of a power point presentation. Projector and screen to show contents appropriately to all the students during class.</p> <p>For performing Workshop 1: Students need a personal computer to connect to the Internet and access information searches. They will also use the worksheet printed out for students to fill in.</p>



	<p>For performing Workshop 2: Students need a personal computer to work on a power point presentation and with Internet connection in case they need to look for any extra resource.</p>
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DESCRIPTION OF THE CLASS/ACTIVITY

The material proposed for the preparation of the class for the students can be divided into two parts mainly to facilitate its teaching:

1st part. Presentation block and introductory work.

In this part a small presentation on instrumental techniques of movement analysis will be shown by means of the slides provided; Remember that the slides are just a proposal and you can modify, enlarge or reduce them according to your objectives and/or needs.

Workshop 1 aims to introduce students to the knowledge of these techniques and their uses through a literature search. Subsequently, students will share the info collected of an activity/gesture and instrumental technique selected.

Workshop 1 is here presented, which is also synthesized in the ppt.

1. Students are grouped in pairs for this work. A name must be assigned to the pair.
2. With the help of the whole class, 10 interesting topics will be selected regarding activities/gestures/joints that can be measured with instrumental techniques. Two pairs are assigned to each topic to work on it; one will make the work sheet looking for information where that gesture/activity/... is studied using an optical capture system; and the other pair on the same topic but using IMU's (inertial sensors) or another instrumental technique.
3. Each couple answer the questions proposed in the worksheet.
4. Once the sheets are finished, the two pairs are proposed to answer alternately the questions posed by the worksheet in front of the teacher and the rest of students.
5. The teacher will value the work done by each pair and invite the rest of the students to talk about the differences of each instrumental technique for.

2nd part. Theoretical knowledge and study approach.

Before the work done in class it is convenient that the student acquires more knowledge about the instrumental techniques. In this case, it is proposed that they prepare this class by reading the theoretical contents provided in the autonomous work part of unit D.1

This second part is complemented with **Workshop 2**. This **Workshop** has the following workflow:

1. Students are grouped in pairs for this work. A name must be assigned to the pair.

2. Each pair must prepare a presentation containing at least the following points:
 - a. What do you want to measure and why?
 - b. What would be the main objectives of your study related to movement analysis?
 - c. What is the instrumental technique you would choose?
 - d. What do you think would be the best variables that could help you in this study?

Optionally, they can look for information on the internet in case they need it to complete the presentation (only as a supporting source, not copying the information of any given scientific paper).

3. Once the presentation is completed, each pair presents the result of their work to the rest of the students. The teacher encourages students to come up with alternatives to the instruments selected by each pair.

TASKS TO BE DEVELOPED BY THE STUDENT OUTSIDE OF CLASS (if required)

In order to fully understand the concepts explained during class, the student should revise in advance the pdf document associated to this didactic unit D.1: How can movements be measured and which parameters can be analyzed? What are its main applications? (autonomous work) before Workshop 2.

EVALUATION METHODOLOGY

OPTIONAL (in case the teacher decides to evaluate the activity)

The teacher will evaluate the answers of the worksheet and the presentations of each couple, according to their criteria and acceptance among the rest of the students in the class.

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