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| **Module Code** | STU12502 |
| **Module Name** | Introduction to Statistics II |
| **ECTS Weighting[1]** | 5 ECTS |
| **Semester taught** | Semester 2 |
| **Module Coordinator/s** | Athanasios G. Georgiadis |

**Module Learning Outcomes**

On successful completion of this module, students will be able to:

LO1.   Describe, analyse and present data viastatistical machinery;
LO2.   Estimate population parameters using maximum likelihood estimators;
LO3.   Deal with the Central Limit Theorem;
LO4.   Extract confidence intervals for population parameters;
LO5.   Study hypothesis tests and decide about values of several population parameters;
LO6.   Deal with regression models and do statistical inference on their parameters;
LO7.   Build ANOVA tables and study relations between groups.

**Module Content**

To introduce Students to Statistics. The main notions of Statistics that are fundamental for a Mathematician, will be studied.

•        Descriptive Statistics;

•        Statistical estimation;

   •   The Central Limit Theorem;
   •   Confidence intervals;
   •   Statistical inference: Hypothesis testing;
   •   Regression;
   •   ANOVA;

Basic Statistical notions as an outcome of Probability Theory, will be in the disposal of Math Students.

**Teaching and Learning Methods**

Two lectures and one tutorial per week

**Assessment Details[2]**

The final mark is the weighted average of the following table.

| Assessment Component | Brief Description | Learning Outcomes Addressed | % of total | Week set | Week due |
|---|---|---|---|---|---|
| Examination | 24-hour examination | LO1, …, LO7 | 50% | n/a | n/a |
| Assignment 1 | assessments | LO1,LO2,LO3 | 25% | 5 | 6 |
| Assignment 2 | assessments | LO4,LO5 | 25% | 8 | 9 |

[1]TEP Glossary
[2]TEP Guidelines on Workload and Assessment

| **Reassessment Details** | Examination (2 hours, 100%) |
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| **Contact Hours and Indicative Student Workload** | Contact Hours (scheduled hours per student over full module), broken down by: | **33 hours** |
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| | lecture | 22hours |
| | | |
| | tutorial | 11 hours |
| | other | 0hours |
| | **Independent study (outside scheduled contact hours), broken down by:** | **72 hours** |
| | preparation for classes and review of material (including preparation for examination, if applicable) | 41hours |
| | completion of assessments (including examination, if applicable) | 42hours |
| | **Total Hours** | **116 hours** |

| **Recommended Reading List** | Full manuscripts and videos as well as corresponding exercises, will be provided by the instructor to Students. Some auxiliary literaturefor the mainstream Statistics follows:

Sheldon M. Ross-Introduction to Probability and Statistics for Engineers and Scientists-Academic Press (2004).

Hayter A.J. - Probability and Statistics for Engineers and Scientists-Doxbury (2012).

Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, Keying E. Ye - Probability and Statistics for Engineers and Scientists (9th Edition)  -Prentice Hall (2011). |
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| **Module Pre-requisites** | **Prerequisite modules:**STU12501.

**Other/alternative non-module prerequisites:**knowledge of elementary probability, especially the normal distribution, expectation and variance. |
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| **Module Co-requisites** | |
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| **Module Website** | Available in Blackboard. |
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| **Last Update** | 25/07/2020 by Athanasios G. Georgiadis |
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