Module Code	STU44005
Module Name	Decision Analysis
ECTS Weighting[1]	5 ECTS
Semester taught	Semester 1
Module Coordinator/s	Athanasios G. Georgiadis
Module Learning Outcomes	On successful completion of this module, students will be able to: LO1. Model problems and extract decisions in operations research, using deterministic dynamic programming; LO2. Decide under stochastic procedures about celebrated problems in operations research; LO3. Employee Markov chains for obtaining decisionsin several problems that depend on time evolutionsgoverned by probabilities.
Module Content	To introduce Students to the field of Operations Research. The Students will model and solve problems popping up from Operations Research. The powerful tools of Dynamic Programming (both deterministic and stochastic) as well as Markov chains will be studied in depth. • Deterministic Dynamic Programming: Optimal route problem, Equipment replacement, Resource allocation, Optimal load problem; • Stochastic Dynamic Programming: The preceding problems in a stochastic form; • Markov Chains in Operations Research; The module contains decisive knowledge for Students of MSISS.At the same time, it consists a precise field ofapplication of the mathematical knowledges of Math Students.
Teaching and Learning Methods	Two lectures and one tutorial per week.

[1] TEP Glossary

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, LO2, LO3	40%	n/a	n/a
Assignment 1	assessments	LO1	30%	5	6
Assignment 2	assessments	LO2	30%	8	9

Reassessment Details

Examination (2 hours, 100%)

Contact Hours and Indicative Student Workload

Contact Hours (scheduled hours per student over full module), broken down by:	**33 hours**
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 literature that deals for the mainstream Operations Research follows.

Dimitri P. Bertsekas, Dynamic Programming and Optimal Control, Vol. I, 4TH EDITION, 2017.

Dimitri P. Bertsekas, Dynamic Programming and Optimal Control, Vol. II, 4TH EDITION: APPROXIMATE DYNAMIC PROGRAMMING 2012.

Wintson, Operations Research: Applications and Algorithms, 2003.

Module Pre-requisites

Prerequisite modules: The module is designed to be self-containe. Philosophical outcomes from STU22006 are welcome.

Other/alternative non-module prerequisites:knowledge of elementary probability.

Module Co-requisites

Module Website

Available in Blackboard.

Last Update

25/07/2020 by Athanasios G. Georgiadis.

[2] TEP Guidelines on Workload and Assessment