University POLITEHNICA of Bucharest

Faculty of Industrial Engineering & Robotics

Study programme: Industrial Engineering

Form of study: Bachelor

COURSE SPECIFICATION

Course title	Modelling and Simulation	Semester	4
Course code	UPB.06.D.04.A.007	ECTS	3

Course structure	Lecture	Seminar	Laboratory	Project	Total hours
No. of hours/ week	2	-	1	--	-
No. of hours/ semester	28	-	14	-	-

Lecturer	Lecture	Seminar	Laboratory	Project
Name, academic degree	Constantinescu Dan Mihai, professor, Ph.D. engineer	-	Apostol Dragos Alexandru, lecturer, Ph.D. engineer	-
Contact (E-mail, location)	dan.constantinescu@upb.ro	-	dragos.apostol@upb.ro	-

Course description (max: 200 words) Knowledge of the theoretical basis of the modelling and simulation concepts by surveying its paradigms and methodologies. Topics discussed in the course include systems analysis and classification, understanding the completion of abstract and simulation models, of continuous, discrete, and combined models. It also covers pseudo-random number generation and the use of Monte Carlo method.

Seminar description (max: 200 words) -

Laboratory description (max. 200 words) Data interpretation, Probability and Statistics, Modeling and Visualization are also introduced with particular attention to their importance as related to Modelling and Simulation. Topics such as humans in simulations, verification and validation, distributed simulations, and interoperability are among the methodologies. The Monte Carlo, continuous, and discrete event simulations are introduced as a foundation.

Project decsription (max. 200 words) -

Assessment methods	Percentage of the final grade	Minimal requirements for award of credits
Written exam	40	20
Report/ Project	-	-
Homework	-	-

Laboratory	60	30

References
1. Hector Guerrero, *Excel Data Analysis: Modeling and Simulation*, ISBN-10: 3642108342 | ISBN-13: 978-3642108341, 2010.
2. *Modelling and Simulation*, Edited by Giuseppe Petrone and Giuliano Cammarata, ISBN 978-3-902613-25-7, 2008.
3. *Principles of Modeling and Simulation: A Multidisciplinary Approach*, Edited by John A. Sokolowski and Catherine M. Banks, ISBN-10: 0470289430 | ISBN-13: 978-0470289433, 2009.
4. Robert L. Woods, Kent L. Lawrence, *Modeling and Simulation of Dynamic Systems*, ISBN-10: 0133373797 | ISBN-13: 978-0133373790, 1997.
Courses taugh at Massachusets Institute of Technology and University of Detroit Mercy.

Prerequisites	Co-requisites (courses to be taken in parallel as a condition for enrolment)
Algebra, Mathematical Analysis, Computer Programming, Tehnology, Materials Science, Mechanics of Materials, Probability and Statistics	Materials Technology, Machine Elements

Additional relevant information: Students may take pictures or audio-video recordings in the rooms where the teaching is done only with the permission of the teacher and under the conditions set by him/her. At the entrance to the classroom, students are asked to switch mobile phones to silent mode and not to use them during classes.

All files and applications received by students directly, by e-mail or by post on the e-learning Moodle platform are subject to national and international copyright laws; these may be used by students only for didactic purposes; any other use or posting on open access sites, without the consent of the copyright holder may be punished in accordance with the Romanian Law on Copyright and Related Rights No 8/1996 and in accordance with the Berne Convention.

Date: 12.05.2022