

University POLITEHNICA of Bucharest

Faculty of Industrial Engineering & Robotics

Study programme: Industrial Engineering

Form of study: Bachelor

### COURSE SPECIFICATION

<b>Course title</b>	<b>Robotics</b>	<b>Semester</b>	<b>6</b>
<b>Course code</b>	<b>UPB.06.S.06.O.003</b>	<b>ECTS</b>	<b>4</b>

<b>Course structure</b>	<b>Lecture</b>	<b>Seminar</b>	<b>Laboratory</b>	<b>Project</b>	<b>Total hours</b>
<b>No. of hours/ week</b>	<b>2</b>		<b>2</b>		<b>4</b>
<b>No. of hours/ semester</b>	<b>28</b>		<b>28</b>		<b>56</b>

<b>Lecturer</b>	<b>Lecture</b>	<b>Seminar</b>	<b>Laboratory</b>	<b>Project</b>
<b>Name, academic degree</b>	<b>Prof. dr. eng. Diana POPESCU</b>		<b>Prof. dr. eng. Diana POPESCU</b>	
<b>Contact (E-mail, location)</b>	<b>diana.popescu@upb.ro RSP Dept., room CK 110</b>		<b>diana.popescu@upb.ro RSP Dept., room CK 110</b>	

#### **Course description (max: 200 words)**

Understanding fundamentals of Robotics and backgrounds of industrial robots and their specific applications. Specific approach on industrial robot (IR) & peripheral equipment's (PE) design and operation, industrial robot specific implementing into manufacturing systems as well as robotic manufacturing systems design and operation. Background for diploma works in Industrial Engineering specialization.

#### **Seminar description (max: 200 words)**

#### **Laboratory description (max. 200 words)**

Assisted and applicative study of constructive and functional characteristic of IR / PE; understanding the IR's operation specificity; analysis of end-effectors and automated tool changing system design and necessary adaptors for different real scale applications; teach-in programming of IR; for different IR types and robotized manufacturing applications

#### **Project description (max. 200 words)**

<b>Assessment methods</b>	<b>Percentage of the final grade</b>	<b>Minimal requirements for award of credits</b>
<b>Written exam</b>	40%	50% of total quote for exam (complete presentation for at

		least two subjects, or minimum 50% presentation for all three subjects of written exam)
<b>Report/ Project</b>	-	
<b>Homework (1+2)</b>	20%	100% upload of all laboratory works on Moodle, final homework presentation and sustaining, 50% of grade for each homework evaluation
<b>Laboratory (3)</b>	25%	100% presence on laboratory activities, upload of all laboratory works on Moodle, presence on final laboratory evaluation, 50% of total grade for final laboratory evaluation
<b>Written test in week 8/9</b>	15%	Presence on written test, 50% of total allocated grade

<b>References</b>
<p>1. "Robotic Visions to 2020 and beyond - The Strategic Research Agenda for Robotics in Europe, 07 / 2009", EUROP - European Robotics Technology Platform, Publisher EUROP, Diamant Building Bd. A Reyers 80, 1030, Brussels, Belgium, 07 / 2009</p> <p>2. Nicolescu, A., „Roboti Industriali – Vol.1 Sub sisteme si ansambluri componente. Structura axelor comandate numeric ale RI”, 321 pag., 233 fig. si tabele, ISBN 973 – 30 – 1244 – 0, Editura Didactica si Pedagogica RA, 2005, Bucuresti</p> <p>3. Nicolescu, A., Stanciu, M.D., Popescu D.- „Conceptia si exploatarea robotilor industriali - Vol.1 Tendinte actuale in conceptia si exploatarea RI. Precizia de lucru si precizia volumetrica. Componente organologice specifice. Tehnici si metode de studiu al comportarii elastice si performantelor robotilor industriali” ISBN 973-718-007-0, Ed. Printech, 2004, Bucuresti</p> <p>4. Nicolescu A., Marinescu D., Ivan M., Avram C., - Conceptia si exploatarea sistemelor de productie robotizate – Vol. I Sistem robotic modular pentru cultivare controlată și procesare integrată a ciupercilor alimentare și terapeutice, 300 pag. Ed. Politehnica Press, 2011, ISBN 978 – 606 – 515 – 339 – 4 (general), ISBN 978 – 606 – 515 – 340 – 0 (vol I)</p> <p>5. Nicolescu A., Dobrescu T., Ivan M., Avram C., Brad S., Doroftei I., Grigorescu S. – „Roboti industriali, tehnologii si sisteme de productie robotizate”, 190 pag., Ed Academiei Oamenilor de Stiinta din Romania, 2011, ISBN 978 – 606 – 8371 – 48 – 1</p>

<b>Prerequisites</b>	<b>Co-requisites (courses to be taken in parallel as a condition for enrolment)</b>
Technical Drawing, Tolerances Design Mechanics of Materials 1, 2 Computer Aided Design 1 (AutoCAD) Computer Aided Design 2 (CATIA V5)	<b>None</b>

<p>Machine elements <b>Mechanical Systems Design</b> <b>Manufacturing Processes 1</b></p>	
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**Additional relevant information:**

**Date: 16.05.2022**

**Professor PhD Eng., Diana POPESCU**