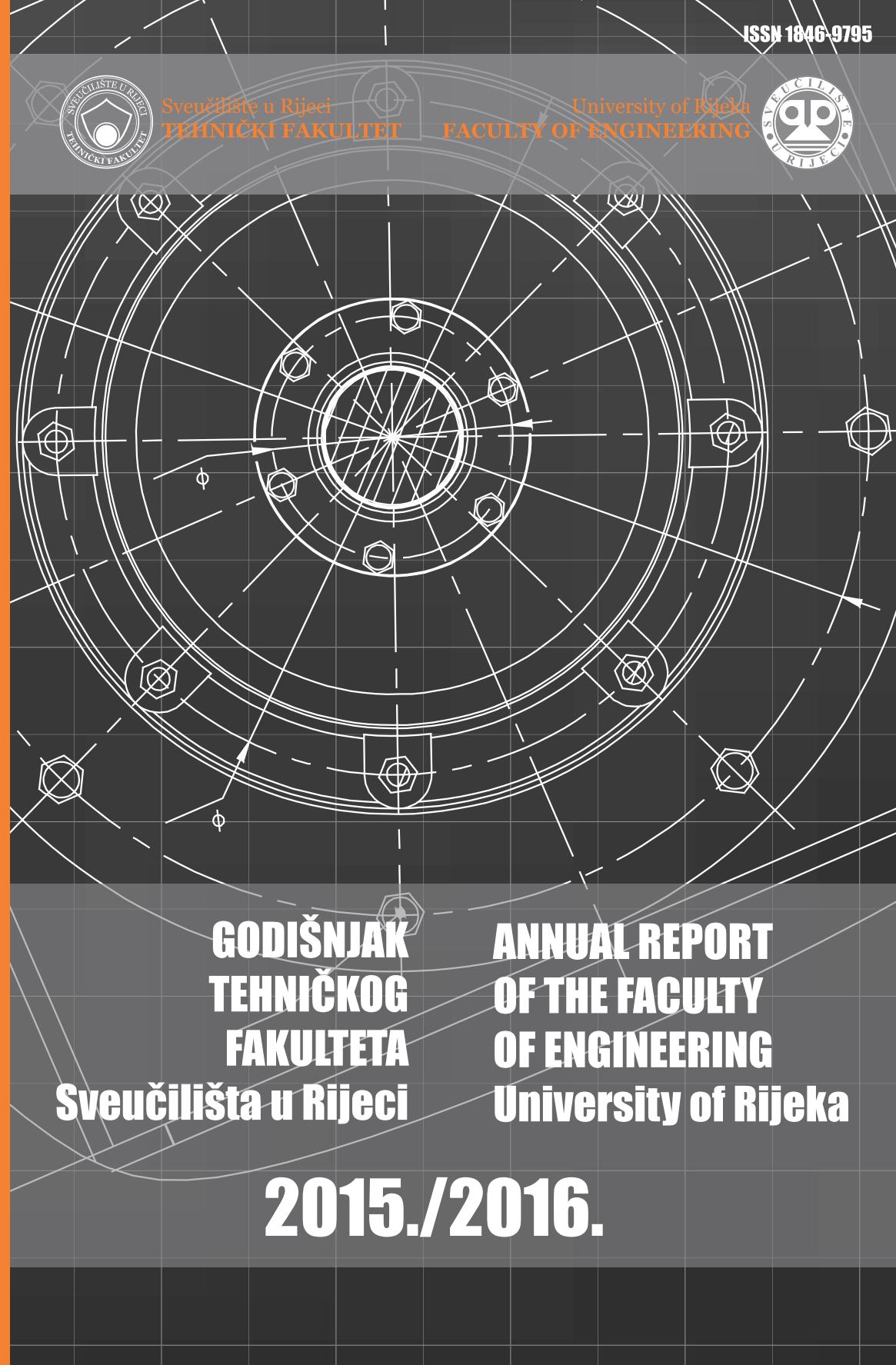


GODIŠNJAK TEHNIČKOG FAKULTETA Sveučilišta u Rijeci • ANNUAL REPORT OF THE FACULTY OF ENGINEERING University of Rijeka 2015./2016.



Sveučilište u Rijeci  
TEHNIČKI FAKULTET

University of Rijeka  
FACULTY OF ENGINEERING

**GODIŠNJAK  
TEHNIČKOG  
FAKULTETA  
Sveučilišta u Rijeci**

**2015./2016.**

GODIŠNjak  
**TEHNIČKOG FAKULTETA**  
**ANNUAL REPORT**  
**OF THE FACULTY OF ENGINEERING**

Sveučilište u Rijeci  
University of Rijeka

2015./2016.  
2015/2016



*Sveučilište u Rijeci  
Tehnički fakultet*

*University of Rijeka  
Faculty of Engineering*

**GODIŠNJAK TEHNIČKOG FAKULTETA SVEUČILIŠTA U RIJECI 2015./2016.**  
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# predgovor dekana

## dean's preface



Dragi prijatelji Tehničkoga fakulteta, dragi čitatelji,

u rukama držite najnovije izdanje našeg Godišnjaka posvećeno, ovaj put, pedeset šestoj obljetnici Fakulteta. U njemu smo saželi aktivnosti naših djelatnika i studenata, kao i postignuća ostvarena tijekom akad. god. 2015./16. Zahvaljujući rezultatima sustavnog provođenja strategije temeljene na izvrsnosti u nastavnoj, znanstvenoj i stručnoj djelatnosti, Fakultet se pozicionirao kao visokoorganizirana i prepoznatljiva sastavnica Sveučilišta u Rijeci te kao jedna od vodećih institucija u Hrvatskoj koja odgaja i obrazuje stručnjake iz područja strojarstva, brodogradnje, elektrotehnike i računarstva. Zadatak nam je, i obveza, tu razinu prepozнатljivosti zadržati u periodu koji je pred nama, a što, zasigurno, neće biti nimalo lako jer će od nas tražiti spremnost na brze promjene i prilagodbe.

Da bismo taj cilj i ostvarili, u svrhu podizanja razine kvalitete nastave, naročito one praktične, četvrtu godinu zaredom uložili više od milijun kuna vlastitih sredstava u nabavku nastavno-laboratorijske opreme. Nadam se da će nam finansijske prilike omogućiti da s istom praksom nastavimo i nadalje. Priliku za osnaživanjem naše znanstvene infrastrukture vidimo i kroz projekt Centar tehničkih znanosti Sjevernoga Jadrana, a prijavu kojeg za financiranje iz europskih sredstava priprema radna skupina predvođena prof. dr. sc. Zlatanom Carom.

Zadovoljstvo mi je ponovo u predgovoru Godišnjaka istaći da je naš časopis Engeenering Review, kojeg izdajemo zajedno s Građevinskim fakultetom, uspio zadržati poziciju u gornjem domu svjetskih časopisa u svojoj kategoriji na listi bibliometrijske baze SCImago, a svoju je kvalitetu konačno potvrdio i ulaskom u

Dear Friends of the Faculty of Engineering, Dear Readers,

You are holding the latest edition of our Yearbook, which is dedicated this time to the 56th anniversary of the Faculty. We have summarised in it the activities of our staff and students as well as the achievements realised during the 2015/2016 academic year. Thanks to the results of the systematic implementation of the Strategy based on excellence in teaching, research and professional activities, the Faculty has established itself as a highly organised and recognisable member of the University of Rijeka and as one of the leading institutions in Croatia, educating professionals in the field of mechanical engineering, naval architecture, electrical engineering and computer engineering. It is our task, as well as our obligation, to maintain this level of visibility in the period ahead of us, which is no doubt an easy task because it will request from us readiness for quick changes and adjustments.

To accomplish this goal and above all raise the quality of teaching, especially of its practical part, for the fourth consecutive year we have invested more than one million kuna of our own funds in purchasing appropriate teaching and laboratory equipment. I hope that our financial situation will allow us to continue with the same practice. We also see the opportunity for strengthening our scientific infrastructure through the Engineering Sciences Centre of the Northern Adriatic project, the application of which for European funds is being prepared by the working group led by Prof. D. Sc. Zlatan Car.

It is a pleasure again to emphasize that our journal Engineering Review, which we publish in association with the Faculty of Civil Engineering, has managed to keep its position as one of the

najcjenjeniju svjetsku bazu Web of Science. Stoga zahvalu i čestitke upućujem Uredništvu ER-a predvođenom prof. dr. sc. Josipom Brnićem kao glavnim urednikom, a kojeg još čine i izv. prof. dr. sc. Marina Franulović, izv. prof. dr. sc. Aleksandra Deluka-Tibljaš (GF), prof. dr. sc. Kristian Lenić, doc. dr. sc. Tihana Galinac-Grbac i doc. dr. sc. Dubravko Franković.

Da sve što radimo nije ostalo i nezapaženo potvrđuju i ovogodišnje nagrade i priznanja našim istraživačima. Tako je prof. dr. sc. Josipu Brniću, zbog duge i plodonosne znanstvene karijere, uručena povelja o proglašenju počasnim građaninom Dobrinja, dr. sc. Ervin Kamenar dobio je Nagradu Zaklade Sveučilišta u Rijeci za tehničke i prirodne znanosti u kategoriji znanstvenih novaka i asistenata, dok je student Antonio Mileta dobio Rektorovu nagradu za izvrsnost u studiranju. Čestitam!

Radnoj skupini za izradu Godišnjaka zahvaljujem na trudu uloženom u pripremu i uređenje cijelokupne građe. Radnu je skupinu ovaj put predvodio dr. sc. Sanjin Kršćanski kao glavni urednik, a pomagali su mu doc. dr. sc. Sven Marićić kao pomoćnik glavnog urednika, dr. sc. Loredana Simčić, dr. sc. Neven Munjas i studentica Wendy Herceg.

Na kraju, svim djelatnicima i studentima Tehničkog fakulteta čestitam pedeset šestu obljetnicu!

U Rijeci, 30. rujna 2016.

Dekan  
Prof. dr. sc. Goran Turkalj



top world journals in its category in the SCImago bibliometric database. Moreover, its quality has been additionally confirmed by its inclusion in the prestigious Web of Science database. I extend my thanks and congratulations for these achievements to its Editorial Board led by Prof. D. Sc. Josip Brnić as Editor in Chief, and its members: Assoc. Prof. D. Sc. Marina Franulović, Assoc. Prof. D. Sc. Aleksandra Deluka-Tibljaš (Faculty of Civil Engineering), Prof. D. Sc. Kristian Lenić, Assist. Prof. D. Sc. Tihana Galinac-Grbac and Assist. Prof. D. Sc. Dubravko Franković.

That these activities of our staff do not pass unnoticed is confirmed by the fact that this year too our researchers were winners of distinguished awards and recognitions. So Prof. D. Sc. Josip Brnić, due to a long and fruitful career as scientist, was awarded the Honorary Citizen of Dobrinj Charter. D. Sc. Ervin Kamenar won the Award of the Foundation of the University of Rijeka in the fields of engineering and natural sciences in the category of research fellows and assistants, while student Antonio Mileta received the Rector's Award for excellence in the study. My congratulations!

For the effort invested in preparing the material for this issue of the Yearbook, I express my gratitude to the working group, led this year by D. Sc. Sanjin Kršćanski as Editor in Chief, who was assisted by Assist. Prof. D. Sc. Sven Marićić (assistant to the editor in chief), D. Sc. Loredana Simčić, D. Sc. Neven Munjas and student Wendy Herceg.

Finally, I congratulate all the Faculty staff and students on our Faculty's fifty-sixth anniversary!

Rijeka, 30 September 2016

Dean  
Prof. D. Sc. Goran Turkalj

# 1 opće informacije general information

Tehnički fakultet Sveučilišta u Rijeci stožerna je visokoškolska i znanstvenoistraživačka institucija na području tehničkih znanosti ne samo na Sveučilištu u Rijeci nego i u regiji u kojoj djeluje, konkurentna na europskom i svjetskom tržištu znanja. Fakultet objedinjuje djelatnost 11 zavoda, i to:

- Zavoda za automatiku i elektroniku  
Department of Automation and Electronics
- Zavoda za brodogradnju i inženjerstvo morske tehnologije  
Department of Naval Architecture and Ocean Engineering
- Zavoda za elektroenergetiku  
Department of Electrical Power Engineering
- Zavoda za industrijsko inženjerstvo i management  
Department of Industrial Engineering and Management
- Zavoda za konstruiranje u strojarstvu  
Department of Mechanical Engineering Design
- Zavoda za matematiku, fiziku, strane jezike i kinezijologiju  
Department of Mathematics, Physics, Foreign Languages and Kinesiology
- Zavoda za materijale  
Department of Materials Science and Engineering
- Zavoda za mehaniku fluida i računarsko inženjerstvo  
Department of Fluid Mechanics and Computational Engineering
- Zavoda za računarstvo  
Department of Computer Engineering
- Zavoda za tehničku mehaniku  
Department of Engineering Mechanics
- Zavoda za termodinamiku i energetiku  
Department of Thermodynamics and Energy Engineering

U sklopu zavoda djeluje 38 katedri i 50 laboratorija, a na Fakultetu djeluju i Računalni centar, Knjižnica, Financijska služba, Služba nabave i komercijale, Služba općih i kadrovskih poslova, Služba studentske evidencije i Tehnička služba. Od 167 zaposlenika, 72 ih je u znanstveno-nastavnim, 8 u nastavnim i 29 u suradničkim zvanjima, 13 je znanstvenih novaka, dva su zaposlenika na projektima Hrvatske zaklade za znanost, a 39 je djelatnika u administrativnim i stručnim službama. Četvero je zaposlenika izvan sustava MZOŠ. Na Fakultetu radi i veći broj vanjskih suradnika. Fakultet izvodi sveučilišne preddiplomske i sveučilišne diplomske studijske programe

The Faculty of Engineering of the University of Rijeka is a leading higher education, scientific and research institution in the field of engineering sciences not only at the University of Rijeka, but also in the region where it is situated. It is competitive on the European and the world knowledge market. The Faculty encompasses 11 departments, namely:



The departments include 38 sections and 50 laboratories, and the Faculty also has a Computing Centre, a Library as well as an Accounting Division, Procurement Office, the General and Personnel Office, the Student Affairs Office and the Technical Service. Of the total number of 167 employees, 72 are in teaching-research, 8 in teaching and 29 in associate positions, 13 junior researchers, two members of staff work on projects funded by the Croatian Science Foundation, and 39 work in the administrative and professional services. Four employees are outside of the system of the Ministry of Science, Education and Sports.

na području strojarstva, brodogradnje, elektrotehnike i računarstva te stručne preddiplomske studijske programe na području strojarstva, brodogradnje i elektrotehnike, kao i trogodišnji treći ciklus obrazovanja koji omogućava stjecanje doktorata znanosti na području tehničkih znanosti, i to na polju strojarstva, brodogradnje, elektrotehnike, temeljnih tehničkih znanosti te interdisciplinarnih tehničkih znanosti.

Do sada je na Tehničkom fakultetu u Rijeci diplome stekao 131 doktor znanosti, 95 magistara znanosti, 2899 diplomiranih inženjera (od čega 2335 strojarstva, 311 brodogradnje i 253 elektrotehnike), 1536 inženjera (od čega 717 strojarstva, 108 brodogradnje i 711 elektrotehnike), 842 magistra inženjera (od čega 357 strojarstva, 86 brodogradnje, 344 elektrotehnike i 55 računarstva), 1257 sveučilišnih prvostupnika inženjera (od čega 587 strojarstva, 90 brodogradnje, 403 elektrotehnike i 177 računarstva) te 381 stručnih prvostupnika inženjera (od čega 137 strojarstva, 39 brodogradnje i 205 elektrotehnike). Danas tu studira više od 2000 studenata.

Tehnički fakultet ima dugu tradiciju izdavanja znanstvenih i stručnih radova. Tiskanje Zbornika radova započinje još 1970. godine, a 1988. godine spomenuta edicija mijenja naziv u Zbornik Tehničkog fakulteta Rijeka. Naziv se ponovo mijenja 1995. godine u Engineering Review, a pod tim nazivom časopis se tiska i danas. Osim znanstvenih i stručnih radova, djelatnici Fakulteta objavili su i mnogobrojne knjige i udžbenike.

8

Na Fakultetu je od 24. studenog 2000. godine aktivan Alumni klub Tehničkoga fakulteta Sveučilišta u Rijeci (skraćeno ALUMNI TFR) osnovan s primarnim ciljem izgradnje i jačanja veza i suradnje između bivših studenata i Tehničkoga fakulteta, ali i osobne suradnje između bivših studenata. Predsjednik ALUMNI TFR je prof. dr. sc. Zoran Mrša.

Dobrovoljno darivanje krvi na Fakultetu provodi se još od 1980. godine. U novije doba ta hvaljievrijedna aktivnost provodi se organizirano od 2002. godine. U akademskoj godini 2015./2016. održali smo tri akcije (20.10.2015., 15.1.2016. i 18.5.2016.) pri čemu je sakupljeno preko 150 doza ove dragocjene tekućine. Proteklih godina glavni organizator darivanja krvi je prof. dr. sc. Roberto Žigulić, a pomažu mu i članovi Kluba 25. Krv u podjednakom broju daruju i zaposlenici i studenti.

The Faculty engages a large number of external associates. The Faculty offers undergraduate and graduate university study programmes in mechanical engineering, naval architecture, electrical engineering and computer engineering as well as undergraduate vocational study programmes in mechanical engineering, naval architecture and electrical engineering. It also offers a three-year doctoral study in the area Engineering Sciences, in the fields of Mechanical Engineering, Naval Architecture, Electrical Engineering, Fundamental Engineering Sciences and Interdisciplinary Engineering Sciences.

So far, the Faculty of Engineering in Rijeka has delivered 131 D. Sc. and 95 Master of Science degrees. Of the former 2899 Graduate Engineer Diplomas 2335 were in Mechanical Engineering, 311 in Naval Architecture and 253 in Electrical Engineering; and of 1536 Engineer Diplomas 717 were in Mechanical Engineering, 108 in Naval Architecture and 711 in Electrical Engineering. The Bologna programme has produced 842 Master Engineers (357 Mechanical Engineering, 86 Naval Architecture, 344 Electrical Engineering and 55 Computer Engineering), 1257 University Bachelor Engineers (587 Mechanical Engineering, 90 Naval Architecture, 403 Electrical Engineering and 177 Computer Engineering) as well as 381 Vocational Bachelor Engineers (137 Mechanical Engineering, 39 Naval Architecture and 205 Electrical Engineering). At present more than 2000 students study at the Faculty.

The Faculty of Engineering has a long tradition of publishing scientific and technical papers. Proceedings were first published as far back as in 1970, and as of 1988 under the name Proceedings of the Faculty of Engineering in Rijeka. In 1995, this was renamed into Engineering Review, which is still in use today. In addition to scientific and technical papers, the faculty staff has published numerous books and textbooks.

The Alumni Club of the Faculty of Engineering in Rijeka (ALUMNI TFR) was founded on 24th November 2000 with the primary aim of establishing and strengthening ties and cooperation not only between alumni and the Faculty but also among the alumni themselves. The chair of the ALUMNI TFR is Prof. D. Sc. Zoran Mrša.



Na TFR od 1990. godine djeluje i podružnica Nezavisnog sindikata znanosti i visokog obrazovanja. Osim zaštite prava svojih članova, sindikalna podružnica na Fakultetu obavlja i zadatke iz djelokruga rada Zaposleničkoga vijeća koje na fakultetu nije konstituirano. Sindikalni povjerenici Podružnice su prof. dr. sc. Roberto Žigulić iz redova nastavnoga osoblja i Žarko Burić iz redova nenastavnoga osoblja.

Voluntary blood donation at the Faculty has been carried out since 1980. So in the last year, three such events were organized (on 20th October 2015, 15th January 2016 and 16th May 2016), where more than 150 doses of this precious liquid were collected. In recent years, the main organizer of the blood donation has been Prof. D. Sc. Roberto Žigulić, assisted by members of Club 25, the blood being donated by equal number of staff and students. The Faculty Donor's Club organized a gathering on the latest Faculty Day in which a large number of students and staff took part. Awards of merit were handed to jubilarians and older Club donors and activities were remembered.

Since 1990, a subsidiary of the Independent Union of Science and Higher Education Employees of Croatia has been active at the Faculty of Engineering. Apart from protecting the rights of its members, the union branch carries out tasks within the scope of Workers's Council, which has not been organized at the Faculty. The Union representatives of the Subsidiary are Prof. D. Sc. Roberto Žigulić, representing the teaching staff, and Žarko Burić the non-teaching staff.





*Susret sadašnjeg i bivših dekana pred Božićni domjenak*



*/ Meeting of the current and former deans before Christmas reception*

<b>GLAVNI TANIK</b>	<b>VSS</b>	<b>DEKANAT</b>	<b>1</b>	<b>PROFEKANI</b>	<b>DR</b>	<b>POMOĆNI DEKANA</b>	<b>1</b>	<b>VSS</b>
<b>DEKAN</b>	<b>1</b>			<b>Prof. Anica TRP</b>	<b>3</b>			
<b>Tomo VENČIĆ</b>				<b>Prof. Jasna PRPIĆ-COŠIĆ</b>		<b>IZV. PROF. LADO KRAJČEVIĆ</b>		
				<b>Prof. Duško PAVLETIĆ</b>		<b>DSC. Neven BULIC</b>		
<b>ZAVOD ZA AUTOMATIČNU ELEKTRONIKU</b>	<b>1</b>	<b>ZAVOD ZA INŽINIERSKU TEHNOLOGIJU</b>	<b>1</b>	<b>ZAVOD ZA KONSTRUKCIJE I STROJARSTVO</b>	<b>1</b>	<b>ZAVOD ZA RAČUNARSTVO</b>	<b>1</b>	<b>ZAVOD ZA TERMOINZUMSKU I ENERGETIJKU PREDSTOJNIK</b>
<b>PREDSTOJNIK</b>	<b>1</b>	<b>PREDSTOJNIK</b>	<b>1</b>	<b>PREDSTOJNIK</b>	<b>1</b>	<b>PREDSTOJNIK</b>	<b>1</b>	<b>PREDSTOJNIK</b>
<b>Izv. prof. Šaša VLAHNIĆ</b>		<b>Prof. Milan IKAĆ</b>		<b>Prof. Goran TURKALJ</b>		<b>Prof. Josip BRNČ</b>		<b>Prof. Vladimir MEDICA</b>
<b>ZAVOD ZA BRODGRADNJU INŽ. MORSKE TEHNOLOGIJE</b>	<b>1</b>	<b>ZAVOD ZA ELEKTRIČNE SISTEME I MANAGEMENT</b>	<b>1</b>	<b>ZAVOD ZA MATEMATIKU, FIZIKU, STRUZ. I KINEZIOLOGIJU</b>	<b>1</b>	<b>ZAVOD ZA MATERIJALE</b>	<b>1</b>	<b>ZAVOD ZA MEHANIČKI FLUIDA I RAČUNARSTVO</b>
<b>PREDSTOJNIK</b>	<b>1</b>	<b>PREDSTOJNIK</b>	<b>1</b>	<b>PREDSTOJNIK</b>	<b>1</b>	<b>PREDSTOJNIK</b>	<b>1</b>	<b>PREDSTOJNIK</b>
<b>Doč. Dubravko FRANKOVIC</b>		<b>Prof. Rajko ĐEMALJA</b>		<b>Prof. Neven LOVRIN</b>		<b>Prof. Božo SIMOLAN</b>		<b>Prof. Željko JENČEVIĆ</b>
<b>Katedra za mjerne sisteme</b>	<b>1</b>	<b>Katedra za otpori i propulziju broda</b>	<b>1</b>	<b>Katedra za električne strojeve i pogone</b>	<b>1</b>	<b>Katedra za konstrukcije i izradu hidrauličke strojevice</b>	<b>1</b>	<b>Katedra za mehaničku fluida hidrauličke strojeve</b>
<b>VODITELJ</b>	<b>1</b>	<b>VODITELJ</b>	<b>1</b>	<b>VODITELJ</b>	<b>1</b>	<b>VODITELJ</b>	<b>1</b>	<b>VODITELJ</b>
<b>Prof. Nino STOJKOVIC</b>		<b>Prof. Rajko ĐEMALJA</b>		<b>Prof. Livo SUŠNJIĆ</b>		<b>Prof. Gordana MARUŠIĆ</b>		<b>Prof. Goran TURKALJ</b>
<b>Katedra za signale i sisteme</b>	<b>1</b>	<b>Katedra za projektiranje plovnih objekata</b>	<b>1</b>	<b>Katedra za elektrotehniku</b>	<b>1</b>	<b>Katedra za strane jezike</b>	<b>1</b>	<b>Katedra za dinamiku strojeva</b>
<b>VODITELJ</b>	<b>1</b>	<b>VODITELJ</b>	<b>1</b>	<b>VODITELJ</b>	<b>1</b>	<b>VODITELJ</b>	<b>1</b>	<b>VODITELJ</b>
<b>Prof. Vinko SUČIĆ</b>		<b>Prof. Bruno ČALIĆ</b>		<b>Prof. Vedran KRNIĆ</b>		<b>Prof. Božidar KRIŽAN</b>		<b>Prof. Ante TRP</b>
<b>Katedra za elektrogradijnju</b>	<b>1</b>	<b>Katedra za organizaciju i operativski management</b>	<b>1</b>	<b>Katedra za konstrukcije i precizno inhenjerstvo</b>	<b>1</b>	<b>Katedra za strukture i svojstva materijala</b>	<b>1</b>	<b>Katedra za mehaničku hidraulinu konstrukciju</b>
<b>VODITELJ</b>	<b>1</b>	<b>VODITELJ</b>	<b>1</b>	<b>VODITELJ</b>	<b>1</b>	<b>VODITELJ</b>	<b>1</b>	<b>VODITELJ</b>
<b>Prof. Zoran CAR</b>		<b>Prof. Nikša FAFAĐEL</b>		<b>Prof. Julian DOBRINIĆ</b>		<b>Prof. Loreta POMENIĆ</b>		<b>Prof. Goran TURKALJ</b>
<b>Katedra za tehnologiju i organizaciju brodogradnje</b>	<b>1</b>	<b>Katedra za elektroinstalgetičke sisteme</b>	<b>1</b>	<b>Katedra za proizvodnu opremu i robotiku</b>	<b>1</b>	<b>Katedra za strane jezike</b>	<b>1</b>	<b>Katedra za dinamiku strojeva</b>
<b>VODITELJ</b>	<b>1</b>	<b>VODITELJ</b>	<b>1</b>	<b>VODITELJ</b>	<b>1</b>	<b>VODITELJ</b>	<b>1</b>	<b>VODITELJ</b>
<b>Prof. Jasna PRPIĆ-COŠIĆ</b>		<b>Prof. Mirko ĐADIĆ, v. pred.</b>		<b>Prof. Boris OBSIGER</b>		<b>Prof. Ivo IPŠČ</b>		<b>Prof. Marko ČANAJIĆ</b>
<b>Katedra za elektroniku, robotiku i informacione tehnologije</b>	<b>1</b>	<b>Katedra za organizaciju i upravljanje poslojenja i elektroinstalgetičke sisteme</b>	<b>1</b>	<b>Katedra za organizaciju i upravljanje poslojenja i elektroinstalgetičke sisteme</b>	<b>1</b>	<b>Katedra za mehaničku konstrukciju</b>	<b>1</b>	<b>Katedra za mehaničku konstrukciju</b>
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<b>Prof. Željko CAR</b>		<b>Prof. Neven LOVRIN</b>		<b>Prof. Goran CUKOR</b>		<b>Prof. Mirko ĐADIĆ, v. pred.</b>		<b>Prof. Tomislav MRKOVIĆ</b>
<b>Katedra za dinamiku plovnih objekata</b>	<b>1</b>	<b>Katedra za prijenosne snage i transportna rešetra</b>	<b>1</b>	<b>Katedra za kinetiku</b>	<b>1</b>	<b>Katedra za procesno energetsko stvaralaštvo</b>	<b>1</b>	<b>Katedra za mehaničku konstrukciju</b>
<b>VODITELJ</b>	<b>1</b>	<b>VODITELJ</b>	<b>1</b>	<b>VODITELJ</b>	<b>1</b>	<b>VODITELJ</b>	<b>1</b>	<b>VODITELJ</b>
<b>Prof. Jasna PRPIĆ-COŠIĆ</b>		<b>Prof. Albert ZAMARIN</b>		<b>Prof. Goran CUKOR</b>		<b>Prof. Vladimir MEDICA</b>		<b>Prof. Tomislav MRKOVIĆ</b>

Organizacijska struktura Fakulteta - zavodi i katedre

## Organisational Structure of the Faculty - Departments and Chairs

<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 50%;">DEAN'S OFFICE</td><td style="width: 50%; text-align: right;">I VSV</td></tr> <tr><td>SECRETARY GENERAL</td><td style="text-align: right;">DR 1</td></tr> <tr><td>VICE-DEANS</td><td style="text-align: right;">DR 3</td></tr> <tr><td colspan="2">Prof. Antica TRP Assoc. Prof. Ivana PRPIĆ-OSRIĆ Prof. Vinko SUČIĆ Assoc. Prof. Božidar ŠALIĆ</td></tr> </table>	DEAN'S OFFICE	I VSV	SECRETARY GENERAL	DR 1	VICE-DEANS	DR 3	Prof. Antica TRP Assoc. Prof. Ivana PRPIĆ-OSRIĆ Prof. Vinko SUČIĆ Assoc. Prof. Božidar ŠALIĆ		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 50%;">DEAN'S ASSISTANT</td><td style="width: 50%; text-align: right;">DR 1</td></tr> <tr><td>ASSISTANT DEAN</td><td style="text-align: right;">DR 3</td></tr> <tr><td colspan="2">Prof. Jasna PRPIĆ-OSRIĆ Prof. Duško PAVLETIĆ</td></tr> </table>	DEAN'S ASSISTANT	DR 1	ASSISTANT DEAN	DR 3	Prof. Jasna PRPIĆ-OSRIĆ Prof. Duško PAVLETIĆ		<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 50%;">DEPARTMENT OF THERMODYNAMICS AND ENERGY ENGINEERING</td><td style="width: 50%; text-align: right;">DR 1</td></tr> <tr><td>DEPARTMENT HEAD</td><td style="text-align: right;">1</td></tr> <tr><td colspan="2">Prof. Vladimir MEDICA</td></tr> </table>	DEPARTMENT OF THERMODYNAMICS AND ENERGY ENGINEERING	DR 1	DEPARTMENT HEAD	1	Prof. Vladimir MEDICA	
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Prof. Zoran ČAR																						
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Chair of Vessel Construction	DR 1																					
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Prof. Jasna PRPIĆ-OSRIĆ																						
Chair of Process Planning	DR 1																					
HEAD	1																					
Prof. Miljenko PERINCIĆ																						
Chair of Marine Engineering	DR 1																					
HEAD	1																					
Prof. Tomislav MRKOVIĆ																						

TEHNIČKI FAKULTET	I
RUEVA	DR
DEKAN	1
Prof. Goran TURKAU	

URED DEKANA	I
VODITELJ UREDA	VSS
VODITELJ	1
Sanja PRPIĆ	

KNUŽNICA	I
VODITELJ	VSS
VODITELJ	1
Marta ČONČAREVIĆ	

RAČUNALNI CENTAR	I
VODITELJ	VSS
VODITELJ	1
Tatjana ŠKORJANC	

KNUŽNICA	I
VODITELJ	VSS
VODITELJ	1
Ana MIKICOVĆ-PAVLOVIĆ	

PRODIKANI	DR
PRODIKANI	3
Prof. Amica TRP	
Prof. Jasna PRPIĆ-ORŠIĆ	
Prof. Duško PAVLETIĆ	
Tomo Vrgić	

POMOĆNI DEKANA	VSS
VODITELJ	3
Prof. Viktor SUŠIĆ	
Izv. prof. Lada RMANČIĆ-VUKIĆ	
Doc. Neven BULIĆ	
Prof. Goran TURKAU	

TEHNIČKI SURADNIK	I
VODITELJ	VSS
VODITELJ	1
Prof. Boris ŠEGOTA	

SLUŽBA STUDENTSKE EVIDENCIJE	I
VODITELJ	VSS
VODITELJ	1
Nevo PONŠ	

SLUŽBA STUDENTSKE EVIDENCIJE	I
VODITELJ	VSS
VODITELJ	1
Žarko BURIĆ	

ODSEK KINOGOUDSTVA	I
VODITELJ	VSS
VODITELJ	1
Robert MOHORIĆ	

ODSEK KINOGOUDSTVA	I
VODITELJ	VSS
VODITELJ	2
Miljen OSTROGOVIĆ	

ODSEK FINANSIJSKE OPERATIVE	II
VODITELJ	VSS
VODITELJ	2
Ana ŠUTALO Iva SPAJIC	

RAČUNALNI CENTAR	III
VODITELJ	VSS
VODITELJ	1
Siniša VUKOTIĆ	

ODSEK STUDENTSKOG REFERADA	III
VODITELJ	VSS
VODITELJ	1
Antonela ČALETA	

ODSEK STUDENTSKOG REFERADA	III
VODITELJ	VSS
VODITELJ	1
Lidija PETRIĆ	

ODSEK STUDENTSKOG REFERADA	III
VODITELJ	VSS
VODITELJ	1
Josip JURASČ	

ODSEK STUDENTSKOG REFERADA	III
VODITELJ	VSS
VODITELJ	1
Tanja VELEUČIĆ	

ODSEK STUDENTSKOG REFERADA	III
VODITELJ	VSS
VODITELJ	1
Marijana BURIĆ-PEŽOŽIĆ	

ODSEK STUDENTSKOG REFERADA	III
VODITELJ	VSS
VODITELJ	1
Dragica JURIN Lovrečka MALINIĆ	

ODSEK STUDENTSKOG REFERADA	III
VODITELJ	VSS
VODITELJ	1
Svetlana ČUPRĐA Željka DUJIC	

ODSEK STUDENTSKOG REFERADA	III
VODITELJ	VSS
VODITELJ	1
Marijana BURIĆ-PEŽOŽIĆ	

ODSEK STUDENTSKOG REFERADA	III
VODITELJ	VSS
VODITELJ	1
Ljiljana ĐORĐEVIĆ	

ODSEK STUDENTSKOG REFERADA	III
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VODITELJ	1
Marija ĐORĐEVIĆ	

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Marija ĐORĐEVIĆ	

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ODSEK STUDENTSKOG REFERADA	III
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VODITELJ	VSS
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Marija ĐORĐEVIĆ	

ODSEK STUDENTSKOG REFERADA	III
VODITELJ	VSS
VODITELJ	1
Marija ĐORĐEVIĆ	

FACULTY OF ENGINEERING	I
DEAN	DR 1
SECRETARY GENERAL	MS 1
DEAN'S OFFICE	I
OFFICE HEAD	MS 1
Sanja PRVIĆ	Tomo VERGČ
Prof. Goran TURKAU	

VICE-DEANS	I	DR	I
	3		VSS
DEANS ASSISTANT	3	Prof. Vlkor SUČIĆ	1
			Assoc. Prof. Lado KRANIČEVIĆ Asst. Prof. Nenad RULIĆ

ACCOUNTING DIVISION	—	MS
HEAD	—	1
Tatjana ŠKORJANC	Ana MIRROVIĆ-PAVLOVIĆ	

GENERAL AND PERSONNEL OFFICE	1 MS	STUDENT'S REGISTRAR AND AFFAIRS OFFICE	1 MS
HEAD	1	HEAD	1
Lenka ŠTAUDOHAR			Žarko BURĆ

<b>TECHNICAL AND MAINTENANCE SERVICES</b>  <b>HEAD</b>	<b>I</b>  <b>MS</b>  <b>1</b>	<b>Nevio PONIŠ</b>
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<b>ACCOUNTING SECTION</b>	<b>I</b>	<b>MS</b>
<b>HEAD</b>	<b>2</b>	
<b>DATA CENTER</b>	<b>2</b>	
<b>DOMAGOJ CRUENKO</b>		
<b>DARIO MARSANIC</b>		
<b>Mirjana Mihaljević-Vukelić</b>		
<b>Karolina Kastelan</b>		

STUDENTS' REGISTRAR AND AFFAIRS OFFICE	—
ASSOCIATE	1
HEAD	1
VSS	—
PERSONNEL SECTION	—
Snežana MIKULIČ	Danko VIDUČ

LABORATORY	III CSE
LABORANT	2

Bernardo BADURINA

FINANCIAL ACTIVITIES SECTION		II HE
HEAD		2
Ana ŠUTALO	Iva ŠPAJIC	
Siniša VUKOTIĆ		
III CSE	II ASSOCIATE	1
INPUT CENTER		

PERSONNEL SECTION	III CSE	STUDENT'S REGISTRAR SECTION I HEAD	III CSE 1
ADMIN. SECRETARIES	6	Dragica JURIN Lovorka MAULIC	Tanja VELIĆ

Maintenance Workshops	III
HEAD	CSE
	1

Josip JURASIĆ

STUDENTS' REGISTRAR	III
SECTION II	CSE
HEAD	1

Antonela ČALETA

OCCUPATIONAL SAFETY	III SSS
ASSOCIATE	1

Goran BAKOTIĆ

Organizational Structure of the Faculty - Professional and Administrative Staff

# 2 fakultet u akademskoj godini 2015./2016. the faculty in the academic year 2015/2016

## 2.1 opće informacije general information

Na Tehničkom fakultetu, tijekom akademske 2015./2016. godine, u različitim fazama studija aktivno je studiralo 2167 studenata, a studij je u tom razdoblju uspješno završilo 132 magistra inženjera, 195 sveučilišnih prvostupnika i 44 stručna prvostupnika. U istoj je akademskoj godini na našem Fakultetu troje kandidata obranilo doktorske disertacije.

Kao i prethodnih godina, u akademskoj godini 2015./2016. nastavljeno je ulaganje u nabavu nastavne i laboratorijske opreme. Fakultet je u tu svrhu izdvojio dva i pol milijuna kuna.

U travnju 2016. godine Fakultetsko vijeće je prihvatiло izmjenu studijskog programa diplomskog sveučilišnog studija Elektrotehnika te je cijelokupna dokumentacija zatim upućena na daljnji postupak na Sveučilište. Senat Sveučilišta je u svibnju 2016. godine donio odluku o izmjena-ma i dopunama studijskog programa. Usvojene izmjene i dopune povećavaju izbornost, fleksibilnost i atraktivnost u 3. i 4. semestru studija. Smanjen je broj obaveznih kolegija izborne skupine, a uvedena su tri izborna predmeta koji se nude iz veće grupe izbornih predmeta. Neki od kolegija uvode sasvim nove sadržaje, dok se drugi predmeti već nude na ostalim diplomskim studijima Tehničkog fakulteta.

Tijekom akademske godine 2015./2016. na Tehničkom fakultetu se odvijao znanstvenoistraživački rad u okviru 41 znanstvenog projekta, od čega 5 znanstvenih projekata Hrvatske zaklade za znanost, 7 EU projekata, 20 projekata finansiranih od strane Sveučilišta u Rijeci, 4 bilateralna projekta i 5 istraživačkih projekata s gospodarstvom.

Nastavilo se s ostvarivanjem mobilnosti studenata i profesora u sklopu programa Erasmus, dijela LLP Programa za cjeloživotno učenje usmjerenog na visokoškolsko obrazovanje. U programu mogu sudjelovati studenti u svrhu studijskog boravka i obavljanja stručne prakse, kao i nastavno i nenastavno osoblje Sveučilišta u svrhu održavanja nastave, odnosno stručnog usavršavanja.

In the 2015/2016 academic year 2167 students actively studied at the Faculty of Engineering, of whom 132 earned their master's degree, 195 the university bachelor's degree and 44 the vocational bachelor's degree. Three candidates defended their doctoral thesis at our Faculty last academic year.

In the 2015/2016 academic year, the Faculty allocated approximately 2,5 million kuna from its own funds for the purchase of teaching and laboratory equipment.

In April 2016, the Faculty Council accepted amendments to the study programme of graduate university study of Electrical Engineering, and the whole documentation was sent to the University for further processing. In May 2016, the Senate of the University adopted the amendments to the study programme. The adopted amendments to the graduate university study of Electrical Engineering increase electivity, flexibility and attractiveness in the 3rd and 4th semester. The number of mandatory courses from elective group is reduced, and three additional optional courses are offered from a larger group of elective courses. Some of the courses introduce a completely new content, while other courses are already offered in other graduate programs of the Faculty of Engineering.

During the 2015/2016 academic year, scientific-research work was carried out within the framework of 41 scientific projects, of which five were projects of the Croatian Science Foundation, seven were EU projects, 20 projects were funded by the University of Rijeka, four were bilateral projects and five research projects with the industry.

The mobility of students and professors within the framework of the Erasmus programme, part of the LLP Programme for lifelong learning focused on higher education, was further promoted and realized. Students can participate in the programme for the purpose of study sojourn and professional practice, and the university teaching and the non-teaching staff for the purpose of teaching and their professional development.



Tehnički fakultet trenutno ima 22 bilateralna ugovora sa Sveučilištima iz Austrije, Cipra, Češke, Finske, Francuske, Italije, Litve, Mađarske, Poljske, Portugala, Rumunjske, Slovenije, Srbije i Švedske.

U akademskoj godini 2015./2016. naši studenti ostvarili su dvije studijske mobilnosti i jednu mobilnost za obavljanje stručne prakse, dok smo istovremeno realizirali četiri dolazne studentske mobilnosti i dvije dolazne studentske mobilnosti za stručnu praksu. Jedan je profesor realizirao mobilnost u svrhu održavanja nastave, a istovremeno smo zbog istog ugostili pet stranih profesora.

Suradnja s gospodarstvom kao i s drugim znanstvenim i obrazovnim ustanovama iznimno je bitan segment djelatnosti Fakulteta. Stoga je i u akademskoj godini 2015./2016. nastavljeno s umrežavanjem i poticanjem zajedničkog rada na znanstvenim i stručnim projektima, a sklopljeno je i više ugovora i sporazuma o znanstvenoistraživačkoj, obrazovnoj i stručnoj suradnji.

Nastavljeno je i s uređenjem radnih prostora Fakulteta; zamijenjena je električna instalacija, uređeni su zidovi i pod u Laboratorijskoj hali Fakulteta, zamijenjene su dotrajale ploče i uređeni su zidovi i podovi u više učionica, kabineta i ureda. U Laboratorijskoj zgradi Fakulteta zamijenjen je i veći dio dotrajalog namještaja u uredima nastavnika. Kontinuirano se uređuje i okoliš Fakulteta čime se omogućava ugodniji i učinkovitiji rad, studiranje i boravak na Fakultetu.

The Faculty of Engineering currently has 22 bilateral agreements with universities from Austria, Cyprus, the Czech Republic, Finland, France, Italy, Hungary, Poland, Portugal, Romania, Slovenia, Serbia and Sweden.

In the 2015/2016 academic year, two of our students used the study mobility programme and one also used it for professional practice, while at the same time we received four incoming students and two mobilities for professional practice. As regards the mobility of the teaching staff, one of our teachers used it to hold classes elsewhere, while we hosted five foreign teachers for the same purpose.

In the 2015/2016 academic year, the Faculty continued its activities on networking and cooperation with educational and scientific institutions as well as with industry, which resulted in several contracts and agreements on scientific-research, educational and professional cooperation.

The Faculty continued to maintain and upkeep its equipment and premises. Restoration work performed to-date included electrical installations, flooring and walls of the laboratory building, new blackboards and flooring and walls of several lecture rooms, cabinets and offices. In the offices of the teaching staff, in the laboratory building, part of the old furnishing was replaced. Continuous work on the yard of the Faculty allows for more comfortable and efficient work, study and stay at the Faculty.



## 2.2 studenti nagrađeni u ak. godini 2015./2016. awarded students in the 2015/2016 academic year

### PREDDIPLOMSKI SVEUČILIŠNI STUDIJ | UNDERGRADUATE UNIVERSITY STUDY

Studij / Study	Godina / Year	Ime i prezime / Name and surname	Prosjek usvojenosti znanja, vještina i kompetencija / Knowledge, skills and competences average		ECTS
			godine / year	studija / study	
Strojarstvo/ Mechanical Engineering	1.	Dean Lakošeljac	94%	94%	60
	2.	Martin Zlatić	87%	86%	120
Elektrotehnika/ Electrical Engineering	1.	Matteo Samsa	90%	90%	60
	2.	Viktor Gruičić	82%	80%	120
Računarstvo/ Computer Engineering	1.	Marko Njirjak	94%	94%	60
	2.	Dino Ilić	91%	90%	120

### SVEUČILIŠNI PRVOSTUPNICI INŽENJERI | UNIVERSITY BACHELOR ENGINEERS



18

Studij/ Study	Ime i prezime/ Name and surname	Prosjek usvojenosti znanja, vještina i kompetencija/ Knowledge, skills and competences average
Strojarstvo/ Mechanical Engineering	Ante Sikirica	91%
Brodogradnja/ Naval Architecture	Darin Majnarić	74%
Elektrotehnika/ Electrical Engineering	Korino Bogović	90%
Računarstvo/ Computer Engineering	Igor Pejić	94%

### DIPLOMSKI SVEUČILIŠNI STUDIJ | GRADUATE UNIVERSITY STUDY

Studij / Study	Godina / Year	Ime i prezime / Name and surname	Prosjek usvojenosti znanja, vještina i kompetencija / Knowledge, skills and competences average		ECTS
			godine / year	studija / study	
Strojarstvo/ Mechanical Engineering	1.	Fran Ledić	98%	98%	60
Brodogradnja/ Naval architecture	1.	Mihovil Tomašić	86%	86%	60
Elektrotehnika/ Electrical Engineering	1.	Nikola Lopac	99%	99%	60
Računarstvo/ Computer Engineering	1.	Franko Hržić	97%	97%	60

**MAGISTRI INŽENJERI | MASTER ENGINEERS**

Studij/ Study	Ime i prezime/ Name and surname	Prosjek usvojenosti znanja, vještina i kompetencija/ Knowledge, skills and competences average
Strojarstvo/ Mechanical Engineering	Stjepan Piličić	95%
Brodogradnja/ Naval Architecture	Lucija Bujan	92%
Elektrotehnika/ Electrical Engineering	Ivan Jurković	92%
Računarstvo/ Computer Engineering	Ana Vranković	87%

**PREDDIPLOMSKI STRUČNI STUDIJ | VOCATIONAL STUDY**

Studij / Study	Godina / Year	Ime i prezime / Name and surname	Prosjek usvojenosti znanja, vještina i kompetencija / Knowledge, skills and competences average		ECTS
			godine / year	studija / study	
Strojarstvo/ Mechanical Engineering	1.	Igor Zoretić	78%	78%	60
	2.	Darko Pavlović	88%	88%	120
Elektrotehnika/ Electrical Engineering	1.	Renato Lukarić	85%	85%	60
	2.	Robert Švaco	78%	76%	120



## 2.3 časopis "engineering review" the journal "engineering review"



Tehnički fakultet Sveučilišta u Rijeci ima dugu tradiciju izdavanja znanstvenih radova. Publiciranje znanstvenih radova djelatnika Tehničkog fakulteta seže u 1970. godinu kada započinje tiskanje Zbornika radova. Godine 1988. spomenuta edicija mijenja naziv u Zbornik Tehničkog fakulteta Rijeka i konačno 1995. godine uspostavlja se naziv Engineering Review, pod kojim se časopis i danas tiska. Sve spomenute edicije bile su na raspolaganju za objavu radova kako nastavnog osoblja samog fakulteta, tako i svima zainteresiranim. Fakultet nastoji zainteresirati znanstvenu javnost za publiciranje znanstvenih radova, a sve radi širenja razmjene znanstvenih postignuća temeljenih na istraživačkom radu. Područja iz kojih se u časopisu mogu objavljivati radovi prvenstveno obuhvačaju strojarstvo, brodogradnju, temeljne tehničke znanosti, elektrotehniku, računalne znanosti i građevinarstvo. U ovom smislu časopis predstavlja jednu od rijetkih baza za publiciranje radova iz vrlo širokog dijapazona tehničkog područja. Razmatraju se i radovi koji su kvalitetni, a nisu izravno iz tehničkog područja, već mogu biti, primjerice, iz prirodnih znanosti, ali imaju određenu poveznicu s područjem tehnike. Do sada je u razvitiak i uređivanje časopisa uloženo puno truda, posebice pod vodstvom glavnog urednika prof. dr. sc. Branimira Barišića, čija je svestrana aktivnost naglo prekinuta njegovom tragičnom i preranom smrću. Za sve uloženo dugujemo mu iskrenu zahvalnost.

Nakon potписанog ugovora o suizdavaštву časopisa Engineering Review između Tehničkog fakulteta Sveučilišta u Rijeci (dekan prof. dr. sc. Goran Turkalj) i Građevinskog fakulteta Sveučilišta u Rijeci (dekanica prof. dr. sc. Aleksandra Deluka Tibljaš), nastavljaju se aktivnosti oko izdavanja.

The Faculty of Engineering of the University of Rijeka has a long tradition of publishing scientific papers. Significantly, the publication of scientific papers by the employees of the Faculty of Engineering dates back to 1970, when the first issue of Proceedings was published. In 1988, this edition was renamed the Proceedings of the Rijeka Faculty of Engineering and finally in 1995, the journal was renamed again into Engineering Review, its present title.

All these editions have readily published papers written not only by the teaching staff of the Faculty but also by all other interested authors. The Faculty makes every effort to arouse interest of the scientific community in the publication of scientific papers, all with the aim of disseminating and sharing scientific achievements based on research work. Papers eligible for publication in the journal are primarily those from the field of mechanical engineering, naval architecture, fundamental engineering sciences, electrical engineering, computer engineering and civil engineering. In this sense, the journal is one of the few bases that publish papers covering a wide range of engineering areas. However, quality papers not directly from the engineering area are also taken into consideration, for instance, those from the field of natural sciences but linked in a way to the area of engineering. A lot of effort has been invested in developing and editing the journal, particularly, under the leadership of Editor-in Chief, Prof. D. Sc. Branimir Barišić, whose versatile activities were put to an abrupt halt because of his tragic and untimely death. Heartfelt thanks to him for all his contribution.

The Faculty of Engineering of Rijeka University and the Faculty of Civil Engineering of Rijeka



Izdavanje časopisa Engineering Review, od druge polovice 2011. godine, nastavlja se pod vodstvom glavnog urednika prof. dr. sc. Josipa Brnića (Editor-in-Chief) te pomoćnih urednika (Associate Editors): izv. prof. dr. sc. Marine Franulović, prof. dr. sc. Kristiana Leniča, prof. dr. sc. Aleksandre Deluka Tibljaš, doc. dr. sc. Tihane Galinac Grbac i doc. dr. sc. Dubravka Frankovića. Rad je prihvaćen za objavu u časopisu nakon dviju pozitivnih recenzija i obavljene jezične lekturje. Jezičnu lekturu svih radova, nakon njihovih pozitivnih recenzija, vrlo uspješno obavlja Ksenija Mance, prof. Računalna rješenja pružaju izv. prof. dr. sc. Lado Kranjčević i Tatjana Škorjanc, dipl. ing. Broj članova Editorial Boarda kao i broj članova Advisory Editorial Boarda je proširen. Članovi oba uredništva su eminentni domaći i inozemni profesori i stručnjaci. Veliku pomoć u pripremi, uređivanju i tiskanju radova pružaju nastavnici, asistenti i znanstveni novaci Tehničkog fakulteta: doc. dr. sc. Sven Maričić, dr. sc. Željko Vrcan, dr. sc. Neven Munjas, dr. sc. Andrea Andrijašević, Boris Delač, Ivan Volarić te Ivica Androjić i Andrea Načinović Margan s Građevinskog fakulteta u Rijeci.

Časopis Engineering Review indeksiran je u: Aluminum Industry Abstracts, Advanced Polymers Abstracts, Cambridge Scientific Abstract (CSA), Ceramic Abstracts/World Ceramics Abstracts, Compendex, Composites Industry Abstracts, Computer and Information Systems Abstracts, Copper Technical Reference Library, Corrosion Abstracts, Electronics and Communications Abstracts, Engineered Materials Abstracts, High Technology Research Database with Aerospace, Mechanical & Transportation Engineering Abstracts, METADEX, SCImago, SCOPUS, Web of Science (Emerging Sources Citation Index, od 2015. god.)

Zadovoljstvo je istaknuti kako je časopis, temeljem SCIMAGO kategorizacije rangiranja časopisa u 2012. Godini, bio svrstan u Q4 (četvrta kvartila), a u 2014. i u 2015. godini je u Q2. SCIMAGO kategorizacija časopisa temeljena je na bazi SCOPUS. Časopis je uređen za elektroničku obradu svih podataka i elektroničku komunikaciju od prijave radova do recenzentskih postupaka i priopćavanja rezultata podnositeljima (autorima) radova. Časopis ima široku bazu domaćih i inozemnih recenzentata i ona se stalno dopunjava. Svaki rad recenziraju najmanje dva recenzenta od kojih je najmanje jedan inozemni. Za prihvaćanje

University entered into a Contract on co-edition of Engineering Review, signed respectively by Deans Prof. D. Sc. Goran Turkalj and Prof. D. Sc. Aleksandra Deluka Tibljaš, thus ensuring the continuation of its publication.

As of the second half of 2011, Engineering Review has been published under the guidance of Editor-in Chief Prof. D. Sc. Josip Brnić, and Associate Editors: Assoc. Prof. D. Sc. Marina Franulović, Prof. D. Sc. Kristian Lenič, Prof. D. Sc. Aleksandra Deluka Tibljaš, Assist. Prof. D. Sc. Tihana Galinac Grbac and Assist. Prof. D. Sc. Dubravko Franković. A paper is accepted for publication in the journal after two positive reviews, after which language editing of all papers is carried out by Ksenija Mance, B.A. Assistance with computer solutions has been provided by Assoc. Prof. D. Sc. Lado Kranjčević and Tatjana Škorjanc, B.Sc. Furthermore, the member lists of both Editorial Board and Advisory Editorial Board have increased and now include prominent domestic and foreign professors and experts. A great assistance in the preparation and publication of papers is received by teachers, assistants and junior researchers of the Faculty of Engineering: Assist. Prof. D. Sc. Sven Maričić, D. Sc. Željko Vrcan, D. Sc. Neven Munjas, D. Sc. Andrea Andrijašević, Boris Delač, Ivan Volarić, as well as Ivica Androjić and Andrea Načinović Margan from the Faculty of Civil Engineering in Rijeka.

Engineering Review has the following indexing: Aluminum Industry Abstracts, Advanced Polymers Abstracts, Cambridge Scientific Abstract (CSA), Ceramic Abstracts/World Ceramics Abstracts, Compendex, Composites Industry Abstracts, Computer and Information Systems Abstracts, Copper Technical Reference Library, Corrosion Abstracts, Electronics and Communications Abstracts, Engineered Materials Abstracts, High Technology Research Database with Aerospace, Mechanical & Transportation Engineering Abstracts, METADEX, SCImago, SCOPUS, Web of Science (Emerging Sources Citation Index, of 2015).

We are pleased to point out that according to the 2012 SCImago categorization of journals our journal was included in Q4 (fourth quartile), and in 2014 and 2015 in Q2. The SCImago categorization of journals is based on the SCOPUS database. The journal uses electronic processing of all data, so that information on paper application, review procedures and results



rada niti jedna recenzija ne smije biti negativna. Časopis se objavljuje na engleskom jeziku u tri broja godišnje, a radovi su dostupni online (Hrčak, Tehnički fakultet u Rijeci) te u tiskanom obliku. Časopis također može objaviti određeni broj kvalitetnih radova s određenog kongresa, s tim da njihova kvaliteta bude zagarantirana jednom recenzijom kongresa i jednom novom recenzijom. Spomenuti radovi idu u prijavu istom procedurom kao i svi drugi radovi. Na kraju valja spomenuti kako je zainteresiranost za publiciranjem radova u časopisu prilično velika, a ponude za objavljivanjem dolaze iz inozemstva i iz Hrvatske. Ovakvoj zainteresiranosti svakako doprinosi uređeni sustav prijave, recenzija, indeksiranost i komunikacija s autorima.

are electronically communicated to the authors. The journal has a broad base of national and international reviewers, which is constantly being supplemented. Each paper is reviewed by at least two referees, one of whom must be foreign. For the acceptance of the paper, all reviews have to be positive. The journal is published in English, in three issues annually, and the papers are available online (Hrčak, Faculty of Engineering Rijeka) and in printed form. The journal can also include a certain number of quality papers from a congress provided that their quality is guaranteed by one review of the congress and another new review. These papers undergo the same application procedure as all other papers. Finally, it is worth mentioning that lots of authors from Croatia and abroad have shown their interest in publishing their scientific papers in Engineering Review. Communication with authors, an ordered system of application, review and indexing highly contribute to the importance of the journal.



## 2.4 alumni tfr alumni fer



Alumni klub Tehničkoga fakulteta Sveučilišta u Rijeci, skraćeni naziv ALUMNI TFR, udruga je osnovana s primarnim ciljem uspostave te jačanja veza i suradnje između bivših studenata Tehničkoga fakulteta, ali i između bivših studenata međusobno. Udruga je osnovana pod nazivom Akademski klub doktora znanosti, magistara znanosti, diplomiranih inženjera i inženjera Tehničkoga fakulteta Sveučilišta u Rijeci na Osnivačkoj skupštini održanoj u Mramornoj dvorani Pomorskoga i povjesnoga muzeja Hrvatskoga primorja i Rijeke, dana 24.studenoga 2000. godine, u sklopu obilježavanja 40 godina djelovanja Fakulteta.

Svrha ALUMNI TFR je očuvanje tradicije Tehničkoga fakulteta Sveučilišta u Rijeci, promicanje ugleda Fakulteta u Republici Hrvatskoj i inozemstvu, skrb za razvitak i napredak Fakulteta, njegovanje i razvitak etike inženjerskoga poziva, utjecaj na stvaranje javnoga znanstvenog i stručnog mišljenja os vim bitnim pitanjima razvoja struke i znanosti te njihove primjene, utjecaj na razvitak i napredak spoznaje o potrebi očuvanja prirode i čovjekova okoliša, izgradnja i jačanje veza i suradnje između bivših studenata i Fakulteta, poticanje i uspostava veza i suradnje Fakulteta i sličnih obrazovnih, razvojnih i istraživačkih institucija u Republici Hrvatskoj i u svijetu, promicanje ugleda inženjerske struke te uspostava i razvijanje suradnje sa sličnim udrušugama kod nas i u svijetu.

The Alumni Club of the Faculty of Engineering, Rijeka University (ALUMNI FER) is an association established with the primary aim of fostering and strengthening liaisons and cooperation between the former alumni and the Faculty and among the alumni themselves. The association, founded under the name of Academic Fellowship, comprises holders of D. Sc., master's and bachelor's degrees (including former graduate and vocational engineers) of the Faculty of Engineering of the University of Rijeka. It was established at the Inaugural Meeting held in the Marble Hall of the Maritime and History Museum of Croatian Littoral Rijeka on 24 November 2000 to mark the 40th anniversary of the Faculty.

The purpose of the ALUMNI FER is to preserve the tradition of higher education at the Faculty of Engineering of Rijeka University, to promote the reputation of the Faculty in the Republic of Croatia and abroad, to care for its development and progress, to nurture and foster ethics in the engineering profession, to exert influence on the creation of public scientific and professional opinion about all important issues in the development of profession and science, and on the development and advancement of awareness about the need to preserve the nature and the environment. Moreover, the aim is also to strengthen relations and cooperation between the former alumni and the Faculty,



Na dan 30. 09. 2016. godine, ukupni broj registriranih članova ALUMNI TFR je 2150.

U ak. god. 2015./2016., nakon izborne skupštine održane 23.01.2015., predsjednik ALUMNI TFR je prof. dr. sc. Zoran Mrša, dipl. ing., potpredsjednici su prof. dr. sc. Roko Dejhalla, dipl. ing. i Danko Venturini, dipl. ing., a tajnik je dr. sc. Vedran Kirinčić, dipl. ing. U predsjedništvu su: prof. dr. sc. Zmagoslav Prelec, dipl. ing., prof. dr. sc. Roko Dejhalla, dipl. ing., prof. dr. sc. Goran Turkalj, dipl. ing. i dekan Tehničkoga fakulteta, prof. dr. sc. Bernard Franković, dipl. ing., dr. sc. Aleksandar Regent, dipl. ing., prof. dr. sc. Božidar Križan, dipl. ing., Zlatko Komadina, dipl. ing., dr. sc. Serđo Klapčić, dipl. ing., Davor Lukeš, dipl. ing., Ante Maras, dipl. ing., dr. sc. Vedran Kirinčić, dipl. ing., Mladen Merlak, dipl. ing., prof. dr. sc. Zoran Mrša, dipl. ing., prof. dr. sc. Jasna Prpić-Oršić, dipl. ing. i Danko Venturini, dipl. ing. Likvidatorom je imenovan prof. dr. sc. Vladimir Medica, dipl. ing. Nadzorni odbor čine: mr. sc. Slavko Štambuk, dipl. ing., prof. dr. sc. Duško Pavletić, dipl. ing. i Davor Mihovilić, dipl. ing.

U organizaciji ALUMNI TFR, tijekom ak. god. 2015./2016., realizirane su sljedeće aktivnosti:

to encourage the establishment of links and cooperation between the Faculty and similar educational, developmental and research institutions in Croatia and worldwide, to promote the reputation of the engineering profession and establish and develop cooperation with similar organisations at home and abroad.

On 30 September 2016, the ALUMNI FER counted 2150 registered members. The ALUMNI FER board elected at the electoral assembly held on 23 January 2015 comprised: Prof. D.Sc. Zoran Mrša, M.Eng., chairman, vice chairmans Prof. D. Sc.Roko Dejhalla, M.Eng., and Danko Venturini, M.Eng., and secretary D. Sc. Vedran Kirinčić, M.Eng. The current members include: Prof. D. Sc. Zmagoslav Prelec, M.Eng., Prof. D. Sc. Roko Dejhalla, M.Eng., Prof. D. Sc. Goran Turkalj, M.Eng. and Dean of the Faculty of Engineering, Prof. D. Sc. Bernard Franković, M.Eng., D. Sc. Aleksandar Regent, M.Eng., Prof. D. Sc. Božidar Križan, M.Eng., Zlatko Komadina, M.Eng., D. Sc. Serđo Klapčić, M.Eng., Davor Lukeš, M.Eng., Ante Maras, M.Eng., D. Sc. Vedran Kirinčić, M.Eng., Mladen Merlak, M.Eng., Prof. D. Sc.Zoran Mrša, M.Eng., Prof. D. Sc. Jasna Prpić-Oršić, M.Eng., and Danko Venturini, M.Eng. and Prof. D. Sc. Vladimir Medica, M.Eng. as liquidator. The current members of the Supervisory Board are: M.Sc. Slavko Štambuk, M.Eng., Prof. D. Sc. Duško Pavletić, M.Eng. and Davor Mihovilić, M.Eng.

During the 2015/2016 academic year, the following activities were realized by the ALUMNI FER:

- **22. listopada 2015. organiziran je susret 1. generacije studenata TFR**  
22 October 2015, a meeting of the 1st student generation of the Faculty of Engineering
- **29. listopada 2015. organiziran je susret Alumni klubova Regije Alpe-Adria u Mariboru na Strojarskom fakultetu**  
29 October 2015, a meeting of the Alumni Clubs of Alpe-Adria Region, organised at the Faculty of Mechanical Engineering in Maribor
- **12. studenoga 2015. organiziran je susret 6. generacije studenata TFR**  
12 November 2015, a meeting of the 6th student generation of the Faculty of Engineering
- **27. studenoga 2015. organiziran je susret 11. generacije studenata TFR**  
27 November 2015, a meeting of the 11th student generation of the Faculty of Engineering
- **04. prosinca 2015. organiziran je susret 16. generacije studenata TFR**  
4 December 2015, a meeting of the 16th student generation of the Faculty of Engineering
- **19. siječnja 2016. organizirano je predavanje, koje je održao Vedran Kirinčić, docent na Tehničkom fakultetu Rijeka, tajnik Alumni kluba TFR, pod nazivom „Elektroenergetske mreže budućnosti“**  
19 January 2016, Vedran Kirinčić, Associate Professor at the Faculty of Engineering, and secretary of the Alumni FER gave a lecture on "Electrical energy nets of the future"



- **04. veljače 2016.** organiziran je susret 21. generacije studenata TFR  
4 February 2016, a meeting of the 21st student generation of the Faculty of Engineering
- **16. veljače 2016.** potpisani su ugovori o donacijama po 3000 kuna kojima je ALUMNI TFR donirao studentske projekte na Fakultetu i to: Formula Student, Adria Hydrocontest Team i Riteh Waterbike Team  
16 February 2016, donation contracts were signed (of 3,000 kn each), whereby the ALUMNI FER subsidised the Faculty student projects, i.e. "RiTeh - Formula Student", "Adria Hydrocontest Team" and "RiTeh - Waterbike Team".
- **11. ožujka 2016.** organiziran je susret 26. generacije studenata TFR  
11 March 2016, a meeting of the 26th student generation of the Faculty of Engineering
- **05. svibnja 2016.** organizirano je predavanje Branimira Ružočića, dipl. ing., iz poduzeća Tema d.o.o., pod nazivom „Success story“  
5 May 2016, Branimir Ružočić, M.Eng., from Tema d.o.o., gave a lecture titled "Success Story".
- **07. svibnja 2016.** održan je Bal inženjera u Kristalnoj dvorani hotela Remissens u Opatiji  
7 May 2016, the Engineers' Ball was organised in the Cristal Hall of the Remissens Hotel in Opatija
- **19. svibnja 2016.** organizirano je predavanje Siniše Reljića, dipl. ing., direktora poduzeća Navis consulting d.o.o., pod nazivom „Success story“  
19 May 2016, Siniša Reljić, M.Eng., CEO of Navis Consulting d.o.o., gave a lecture titled "Success Story"
- **31. svibnja 2016.** organizirano je predavanje Borisa Popovića, dipl. ing., direktora poduzeća Alarm automatika, pod nazivom „Success story“  
31 May 2016, Boris Popović, M.Eng., CEO of Alarm Automatika, gave a lecture titled "Success Story"
- **13. lipnja 2016.** organiziran je dvodnevni seminar naziva „Producenje trajnosti dijelova ventilatorskih mlinova“ u Valbandonu  
13 June 2016, a two-day seminar "Extending ventilation mills durability" was organised in Valbandon
- **14. lipnja 2016.** organizirano je predavanje Arisa Večerine, dipl. ing., pod naslovom „Plutajući LNG terminali“  
14 June 2016, Aris Večerina, M.Eng., gave a lecture on "Floating LNG terminals"



## 2.5 doktorske disertacije obranjene u akademskoj godini 2015./2016. doctoral dissertations defended in academic year 2015/2016



26

**IME I PREZIME | NAME AND SURNAME:**  
Igor Kegaj

**POLJE | SCIENTIFIC FIELD:**  
Interdisciplinarnе tehničke znanosti / Interdisciplinary Engineering Sciences

**NAZIV RADA | TITLE:**  
**Procjena utjecaja lučkih procesa na okoliš formiranjem okolišnog indeksa**  
The evaluation of the influence of harbour processes on the environment by forming an environmental index

**MENTOR(I) | SUPERVISOR(S):**  
doc. dr. sc. / Assist. Prof. D. Sc. Luka Traven  
prof. dr. sc. / Prof. D. Sc. Julijan Dobrinić

**DATUM OBRANE | DATE OF DEFENCE:**  
15. 2. 2016.

Sažetak:

Budući da standardi zaštite okoliša u lukama nisu ujednačeni, nisu ujednačene ni mjere za procjenu održivosti lučkih poslovanja, kao ni instrumentarij za procjenjivanje trenutnog stanja utjecaja na okoliš lučkog sustava. Svrha istraživanja provedenog u okviru ove doktorske disertacije jest definiranje okolišnog indeksa kao veličine koja odražava razinu utjecaja lučkih procesa na okoliš. Ciljevi ove doktorske

Summary:

As environmental standards are not harmonized in ports, neither are the measures for evaluating the sustainability of port operations, nor the instruments for the assessment of the current condition of environmental efficiency of a port system. The purpose of the research conducted in the framework of the thesis is to define the environmental index as a value which reflects the level of influence of port processes on the

disertacije bili su sljedeći: (1) integracija relevantnih pokazatelja lučkih aktivnosti te procjena utjecaja procesa na terminalu luke na okoliš formiranjem okolišnog indeksa te (2) validacija okolišnog indeksa izradom studije slučaja na kontejnerskom terminalu Brajdica. Za izradu okolišnog indeksa koristila se metodologija složenih indeksa kojom se pomoću pojedinih statističkih metoda, komplikacijom i agregacijom više pojedinačnih pokazatelja formira složeni indeks. Dobiveni indeks omogućuje vrednovanje ukupnog utjecaja lučkih procesa na okoliš. Validacija okolišnog indeksa primjenom na terminalu Luke Rijeka ukazala je laku primjenjivost indeksa te mogućnost praćenja promjene u ekološkim performansama lučkih područja njegovom primjenom. Ovim modelom izračunati okolišni indeks može služiti za prikaz napretka poslovanja lučkog terminala u kontekstu smanjenja onečišćenja lučkog okoliša. Dobiveni indeks može se primijeniti za procjenu trenutnog utjecaja lučkog sustava na okoliš, ali i za identifikaciju trendova pojedinog lučkog sustava ukazujući na njegovu ekološku održivost. Također, primjenom ove metodologije moguće je testirati pojedine zahvate po pitanju lučkih procesa i odrediti njihov doprinos utjecaju lučkog terminala na okoliš. Osim toga, u radu su razmatrana i potencijalna ograničenja ovakvog pristupa..

environment. The goals of the thesis were the following: (1) to integrate relevant indicators of port activities and evaluate the influence of port terminal processes on the environment through the formation of an environmental index and (2) to validate the environmental index through the elaboration of a case study on the container terminal Brajdica. The environmental index will be construed by means of the compound index method, whereby certain statistical methods, like compilation and aggregation of more individual indicators, are used to form a compound index. By means of the obtained index, it will be possible to evaluate the overall effect of port processes on the environment. The validation of the environmental index through the application of the index on the Port of Rijeka terminal showed that the index can be easily applied, and its application enables us to follow the changes in environmental performance of port areas. The environmental index calculated by means of the suggested model may be used to show the progress in port terminal operation in the context of pollution reduction in port area. Furthermore, the obtained index can be used to evaluate the current effect of a port system on the environment, but also to identify trends of a port system implying its sustainability. Also, the application of this methodology may be used to test certain interventions in the port processes and determine their share in the port terminal influence on the environment. In addition, the paper considers the potential restraints of such approach.

**IME I PREZIME | NAME AND SURNAME:**  
Ervin Kamenar

**POLJE | SCIENTIFIC FIELD:**  
Strojarstvo / Mechanical Engineering

**NAZIV RADA | TITLE:**  
**Mehatronički pristup pozicioniranju ultravisokih preciznosti i točnosti**  
Ultra-high precision positioning via a mechatronics approach

**MENTOR(I) | SUPERVISOR(S):**  
prof. dr. sc. / Prof. D. Sc. Saša Zelenika

**DATUM OBRANE | DATE OF DEFENCE:**  
19. 5. 2016.

Sažetak:

Mehatronički sustavi ultravisokih (nanometarskih) preciznosti i točnosti pozicioniranja su u današnje vrijeme vrlo važni u preciznom inženjerstvu i tehnologiji mikro i nano sustava. U disertaciji se temeljito analiziraju nelinearni stohastički učinci

Summary:

Ultra-high precision mechatronics positioning systems are critical devices in current precision engineering and micro- and nano-systems' technologies, as they allow repeatability and accuracy in the nanometric domain to be



trenja koji vrlo često ograničavaju radna svojstva sustava za precizno pozicioniranje temeljenih na kliznim i valjnim elementima. Analizira se stanje tehnike za pomake pri silama manjim od sile statičkog trenja, kao i u režimu klizanja, te se vrednuju postojeći matematički modeli trenja. U razmatranom slučaju mehatroničkog sustava ultravisokih preciznosti i točnosti pozicioniranja namijenjenog montaži i manipulaciji mikrostruktura, trenje koje se javlja kod linearnih jednoosnih pomaka se, zbog jednostavnosti i sveobuhvatnosti toga pristupa, modelira generaliziranim Maxwell-slip (GMS) modelom trenja. Parametri GMS modela se identificiraju na inovativnim eksperimentalnim postavima, i to posebno za pokretački dio analiziranog sustava koji se sastoji od istosmjernog motora s reduktorom, te posebno za linearni translator. Rezultirajući modeli trenja se zatim integriraju u cjeleviti model sustava implementiran u MATLAB/SIMULINK okruženju. Radi minimizacije utjecaja trenja, modelirani odziv sustava uspoređuje se potom s eksperimentalnim rezultatima dobivenim na sustavu reguliranom pomoću često korištenog proporcionalno-integralno-diferencijalnog (PID) regulatora, kada se sustav regulira po načelu unaprijedne veze, te kada se regulira prilagodljivim upravljačkim algoritmom. Regulator s prilagodljivim vođenjem, implementiran unutar stvarnovremenskog sustava temeljenog na programabilnim logičkim vratima, pokazao se kao najbolje rješenje. Stoga se koristi u uzastopnim eksperimentima pozicioniranja iz točke u točku koji predstavljaju željenu funkcionalnost razmatranog sustava. Postignute su tako nanometarska preciznost i točnost (bolje od 250 nm) i to kako kod kraćih (mikrometarskih), tako i duljih (milimetarskih) pomaka. U završnom se dijelu disertacije eksperimentalno analizira i mogućnost korištenja drugih pokretača, osjetnika i strojnih elemenata kao i različitih upravljačkih pristupa pogodnih za ostvarivanje ultravisokih preciznosti i točnosti pozicioniranja strukturama valjkastih oslonaca i morskog dna. Osnovni model polaganja podmorskih cjevovoda te proširenja modela implementirani su i rješavani u softveru Abaqus za različite primjere polaganja cjevovoda. Formuliran je optimizacijski problem određivanja parametara polaganja, za koji je razvijena hibridna specijalizirana optimizacijska metoda temeljena na metodi optimizacije rojem čestica. Razvijeni optimizacijski postupak je testiran i analiziran na više različitih slučajeva polaganja podmorskih cjevovoda.

achieved. The doctoral thesis deals thoroughly with nonlinear stochastic frictional effects that limit the performances of ultra-high precision devices based on sliding and rolling elements. The state-of-the-art related to the frictional behavior in the pre-sliding and sliding motion regimes is considered and different friction models are validated. Due to its comprehensiveness and simplicity, the generalized Maxwell-slip (GMS) friction model is adopted to characterize frictional disturbances of a translational axis of an actual multi-degrees-of-freedom point-to-point mechatronics positioning system aimed at handling and positioning of microparts. The parameters of the GMS model are identified via innovative experimental set-ups, separately for the actuator-gearhead assembly and for the linear guideways, and included in the overall MATLAB/SIMULINK model of the used device. With the aim of compensating frictional effects, the modeled responses of the system are compared to experimental results when the system is controlled by means of a conventional proportional-integral-derivative (PID) controller, when the PID controller is complemented with an additional feed-forward model-based friction compensator and, finally, when the system is controlled via a self-tuning adaptive regulator. The adaptive regulator, implemented within the real-time field programmable gate array based control system, is proven to be the most efficient and is hence used in the final repetitive point-to-point positioning tests. Nanometric-range precision and accuracy (better than 250 nm), both in the case of short-range (micrometric) and long-range (millimeter) travels, are achieved. Different sensors, actuators and other design components, along with other control typologies, are experimentally validated in ultra-high precision positioning applications as well.



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**POLJE | SCIENTIFIC FIELD:**

Interdisciplinarnе tehničke znanosti / Interdisciplinary Engineering Sciences

**NAZIV RADA | TITLE:**

Simuliranje širenja onečišćenja mora Kvarnerskog zaljeva iz priobalnih ispusta

Simulation of pollution spreading of the Kvarner bay sea from coastal sewage

**MENTOR(I) | SUPERVISOR(S):**

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**DATUM OBRANE | DATE OF DEFENCE:**

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## Sažetak:

Cilj ovog rada je predviđanje sanitarno-kakvoće mora Kvarnerskog zaljeva s posebnim naglaskom na priobalno more grada Rijeke gdje se nalazi komunalni i otpadni (onečišćivač) i plaže za kupanje i rekreativnu, računalna simulacija gibanja mora, advekcije i difuzije spregnute s kemijskim reakcijama fekalnih koliforma i fekalnih streptokoka te otopljenog kisika. Za računalnu simulaciju korišten je softver MIKE3 danskog hidrološkog instituta. Period simulacije obuhvaća 36 sati od početka ispusta oblaka onečišćenja, što je dovoljan period za dostatno razrjeđenje koncentracije bakterija. Za spektar vjetrova iz svih osam smjerova tipičnih za Kvarnerski zaljev, te dva različita intenziteta, umjeren i orkanski, forsirano je gibanje morskih masa s realnim rubnim i početnim uvjetima preuzetim iz meteoroloških izvješća i mjernih postaja, uz istovremeno ispuštanje kanalizacijskih voda. Postignuta je mrežna konvergencija te je zaključeno da treba raditi s dvije mreže: grubom, za područje cijelog zaljeva, i finijom, za sjeverni dio zaljeva oko ispusta Delta i grada Rijeke.

Kod svih vjetrova oblak kritičnog onečišćenja fekalnih koliforma granične koncentracije od 100 bakterija po 100 ml mora kreće se uglavnom u smjeru paralelnom s obalom, i to ili u smjeru istoka ili zapada, ne izlazi na površinu mora, ostaje negdje na dubini od 10 do 20 m ispod površine. To je rezultat strujnog polja gibanja mase Kvarnerskog zaljeva, koje pri buri ima svojstvo da se topli površinski sloj mora istiskuje iz zaljeva kroz Srednja i Vela vrata, dok donji hladni slojevi ulaze u zaljev. Pri tome je prosječna vertikalna komponenta brzine uz obalu oko 1 mms<sup>-1</sup>, dovoljna da nakon 3 sata podigne hladnu vodu uz sjevernu obalu Kvarnerskog

## Summary:

The goal of this work is predicting the sanitary quality of the Kvarner bay sea, with special emphasis on coastal sea of city of Rijeka where sewage disposal site and recreation and swimming area are situated, as well as computer simulation of the sea motion with advection and diffusion coupled by chemical reactions of fecal coliforms, fecal streptococci and dissolved oxygen. Danish Hydrodynamic Institute software MIKE3 is used for computer simulation. The simulation period is 36 hours following the discharge of the pollution plume, which period is sufficient for significant extinction of bacteria. For the wind spectra typical for Rijeka bay, and for two intensities, moderate and high, the forcing of sea flow with real boundary and initial conditions taken from meteorological predictions and measurements and sewage discharge were simulated. Mesh convergence has been obtained, with the conclusion that it is sufficient to work with two mesh sizes: coarse, for the whole bay and fine, for the north part of the bay close to sewage discharge and city of Rijeka.

For all winds, the pollution plume with the concentration more than 100 fecal coliforms and 100 fecal streptococci per 100 ml of water, is conveyed mostly parallel to the coast in direction east or west, it does not rise to surface but stays at 10 to 20 meters below the surface. This is the result of the sea motion of Rijeka bay: bora wind conveys surface water layer out of bay through Srednja and Vela doors while deep cold layers of water enter the bay. Mean vertical velocity component close to coast is about 1 mms<sup>-1</sup> high enough to rise cold water in 3 hours and significantly cools surface coastal sea. For south wind (jugo) the situation is reversed; hot surface



zaljeva za 10 m i značajno rashladi površinski priobalni sloj. Pri jugu je situacija obratna: topli površinski slojevi mora ulaze u zaljev kroz jedna ili oba vrata, a hladni pridnjeni izlaze iz zaljeva, akumulirajući topliju vodu u zaljevu.

Osnovni je zaključak kako je gradski kanalizacijski ispust Delta dobro projektiran i izведен, te su sva sanitarna onečišćenja unutar zakonom i pravilnicima ograničenih vrijednosti. Ispust je dovoljno udaljen od obale da nalazi u dijelove zaljeva gdje su lokalne struje uglavnom u smjeru paralelnom s obalom te se oblak onečišćenja ne približava zonama za kupanje i rekreaciju. Čak i ako se poveća protok ispusta za 50 %, onečišćenja će i dalje biti unutar dozvoljenih granica.

sea layers enter the bay through Srednja or Vela vrata, while cold bottom sea layers exit the bay, accumulating warmer sea water in the bay.

Main conclusion is that the sewage discharge Delta is well designed and constructed and all sanitary pollution are within regulatory given boundaries. The discharge site is far enough from the coast where local streams are mostly parallel to coast and the pollution plume does not come close to swimming and recreational areas. Even if discharge is increased 50% the pollution will be within regulatory given boundaries.





## 2.6 aktivnosti, zbivanja i konferencije activities, events and conferences

### 2.6.1 intech2016



Konferenciju IN-TECH 2016 organizirala je udružica World Association for Innovative Technologies (WAIT) i održana je u Pragu, Češka, od 6. do 8. rujna 2016. godine.

Konferencija promovira razvoj novih tehnologija, te njihovu implementaciju u industriji. Konferencija ne bi bila moguća bez međunarodne suradnje Sveučilišta u Rijeci - Tehničkog fakulteta i Tehničkog Sveučilišta u Pragu - Strojarskog fakulteta (slika 1). To je bila sedma po redu IN-TECH konferencija; prijašnje su bile u Pragu, Bratislavi, Rijeci, Budimpešti, Leiriji i Dubrovniku.

Konferencija je održana u kongresnom centru Top Hotela Prag. Sudionici su na raspolaganju imali dvije konferencijske dvorane za prezentacije i poster sekciju tijekom konferencije. Na IN-TECH 2016 konferenciji bilo je prisutno preko 120 sudionika iz 25 zemalja sa preko 100 znanstvenih i stručnih referata.

Konferenciju je otvorio predsjednik WAIT organizacije koji se u uvodnom govoru zahvalio svim sudionicima, naglasivši važnost međunarodne suradnje zbog povezanosti znanstvenika iz različitih područja čime se povećavaju znanstveni doprinosi. Također je istaknuto promoviranje razvoja mladih znanstvenika i njihove suradnje na međunarodnoj razini, što je jedna od intencija ovoga skupa. U naredna dva dana u sklopu konferencije održano je 95 prezentacija znanstvenih radova. Također, na konferenciji je bilo izloženo preko 20 postera. Konferencija je završila svečanom večerom kada su dodijeljene nagrade najboljim radovima.

Conference In-Tech 2016 was organized by the World Association for Innovative Technologies (WAIT) and was held in Prague, Czech Republic, from September 6th to September 8th, 2016.

The conference promotes the development of new technologies and their implementation in the industry. This conference would not be possible without the international cooperation of the University of Rijeka - Faculty of Engineering and the Czech Technical University in Prague - Faculty of Mechanical Engineering (Fig. 1). It was the 7th IN-TECH conference: the previous ones were held in Prague, Bratislava, Rijeka, Budapest, Leiria and Dubrovnik.

The conference was held at the congress centre Top hotel in Prague.

Participants had had two conference halls for their scientific discussions and poster session. At IN-TECH 2016 over 120 participants from 25 countries were present, with about 100 scientific and technical papers presented.

The conference was opened by the president of the WAIT organization who in his opening speech thanked all the participants and pointed out the importance of international cooperation because of the association of scientists from different areas in order to achieve significant scientific contributions. Also the promotion of the development of young scientists and their cooperation on the international level was highlighted, which is one of the intentions of this conference. In the next two days, about 95 scientific papers were presented. Also at the conference over 20 posters were presented. The conference ended with the award ceremony and a gala dinner.





## 2.6.2 mipro2016

MIPRO – 39. međunarodni skup informacijskih i komunikacijskih tehnologija, elektronike i mikroelektronike održao se u Opatiji, u razdoblju od 30. svibnja do 3. lipnja 2016. godine. Tehnički fakultet Sveučilišta u Rijeci bio je jedan od suorganizatora ovog najvećeg nekomercijalnog skupa u Hrvatskoj i šire. Osnovna je svrha skupa predstaviti glavne trendove u razvoju i primjeni informacijsko-komunikacijskih tehnologija u industriji, edukaciji, znanosti i lokalnoj upravi, uz diskusiju o njima. U sklopu MIPRO skupa, međunarodni programski odbor u kojem aktivno sudjeluju i djelatnici Tehničkog fakulteta, pripremio je bogat program. Održano je deset konferencija, sedam okruglih stolova, radionice, tri foruma i niz drugih događanja.

Ove godine MIPRO je okupio više od 1200 akreditiranih učesnika, objavljeni su zbornici radova s gotovo 400 radova autora iz 30 zemalja, s međunarodnom recenzijom.

MIPRO – The 39th International Convention on information and communication technology, electronics and microelectronics was held in Opatija from May 30 until June 03, 2016. The Faculty of Engineering of Rijeka University was one of the co organizers of this biggest non-commercial ICT convention in Croatia and beyond. The main purpose of this event was to present and discuss the main trends in development and application of information-communication technologies within the industry, education, science and local government. Within the MIPRO convention, an international program committee, in which also the members from the Faculty of Engineering participated, prepared a rich program. There were 10 conferences, 7 round tables, three forums, and a lot of other events. This year, more than 1200 registered participants attended MIPRO. In addition, authors from 30 countries published conference proceedings, a collection of almost 400 papers with international reviews.



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Svečano otvorenje MIPRO 2016.  
/ Opening ceremony of MIPRO 2016

## 2.6.3 nt2f16

NT2F16 - 16. međunarodna konferencija o novim trendovima u području zamora materijala i mehanike loma

Tehnički fakultet Sveučilišta u Rijeci bio je suorganizator 16. međunarodne konferencije o novim trendovima u području zamora materijala i mehanike loma (NT2F16), održane u Dubrovniku od 24. do 27. svibnja 2016. godine, gdje su znanstvenici s Fakulteta aktivno sudjelovali u svim fazama njezine provedbe.

Cilj konferencije NT2F16 bio je okupiti znanstvenike i stručnjake iz cijelog svijeta i potaknuti raspravu o karakterizaciji, analizi, predviđanju i procjeni zamora i loma koji se pojavljuju u materijalu konstrukcija. Zamisao konferencije je postati forum za raspravu o postojećim i budućim trendovima u području eksperimentalne, analitičke i numeričke mehanike loma, zamora materijala, procjene integriteta konstrukcija, analize loma te ostalih tema od interesa ovakve grupe znanstvenika. Posebna pozornost posvećena je višeskalnom pristupu istraživanju ponašanja materija te istraživanju novih, inovativnih materijala.

Sudionici NT2F16 konferencije imali su priliku međusobno se povezivati te razmjenjivati ideje u okviru širokog spektra predstavljenih istraživanja. Upoznali su se sa stanjem tehničke u teoriji i primjeni pri rješavanju problema iz područja mehanike loma i zamora materijala. Nadalje, konferencijom je promovirana suradnja između znanstvenika i stručnjaka sa sveučilišta i industrije koji su u svom radu uključeni u spomenuto područje istraživanja.

NT2F16 - 16th International Conference on New Trends in Fatigue and Fracture

Faculty of Engineering University of Rijeka was coorganizer of the 16th International Conference on New Trends in Fatigue and Fracture (NT2F16), which took place in Dubrovnik from May 24th until 27th, where scientists from the Faculty were actively involved in all stages of its implementation.

The aim of the NT2F16 conference was to bring together scientists and experts from around the world to encourage the discussion of characterization, analysis, prediction and assessment of the fatigue and fracture occurring in the material structure. The idea of the conference was to be a forum for discussion forum for argumentation of the current and future trends in the field of experimental, analytical and numerical fracture mechanics, fatigue, structural integrity assessment, failure analysis, and other topics of interest. Special attention was paid to the multi-scale approaches in material behavior research and applications to new materials.

Participants of the NT2F16 conference had the opportunity to connect with each other and exchange ideas within the wide range of the featured research. They got acquainted with the state of the art in the theory and applications of problem solving in the field of fracture mechanics and fatigue. Furthermore, the conference promoted collaboration between scientists and experts from universities and industry who are involved in its work in these areas of research.







## 2.6.4 Ijetna škola ACROSS projekta summer school - the ACROSS project

Od 27. do 31. svibnja održana je ljetna škola u organizaciji Tehničkog fakulteta u Rijeci u sklopu europskog projekta COST Akcije IC 1304 "Autonomous Control for a Reliable Internet of Services" (ACROSS). Ljetna škola održana je u Opatiji, u Hotelu Admiral, kao kolocirajući događaj tradicionalnog 39. ICT MIPRO skupa.

Na ljetnoj školi sudjelovali su predstavnici iz Belgije, Danske, Finske, Hrvatske, Italije, Litve, Makedonije, Mađarske, Njemačke, Portugala, Srbije, Slovačke, Slovenije. Ljetna škola imala je trinaest predavača s vodećih europskih sveučilišta i vodećih industrija iz područja telekomunikacija: Ericssona i Hrvatskog Telekoma.

Predstavljena su najnovija dostignuća u području autonomnog upravljanja mrežama i uslugama budućnosti uz uvjet ostvarenja zadovoljavajuće pouzdanosti za korisnike. Ljetna škola je namijenjena mladim istraživačima koji su ujedno imali priliku predstaviti svoje istraživačke projekte u sklopu MIPRO konferencije i specijalne sesije Mreže i usluge budućnosti (Future Network and Services) i sesije Telekomunikacije i informacije. Profesori s vodećih europskih sveučilišta i stručnjaci iz vodećih industrija iz domene proizvođača mrežne opreme i softverskih tehnologija predstavili su mladim istraživačima i studentima diplomskih studija računarstva najnovija tehnološka dostignuća koja će značajno unaprijediti živote ljudi u budućnosti.

Organizaciju ljetne škole i specijalne sesije Future Network and Services omogućili su Tehnički fakultet Sveučilišta u Rijeci i znanstveno-istraživački projekti EU COST projekt ACROSS i Hrvatska zaklada za znanost kroz uspostavljeni istraživački projekt "Evolving Software Systems: Analysis and Innovative Approaches for Smart Management" (EVOSOFT).

Within the European project COST Actions IC 1304 "Autonomous Control for a Reliable Internet of Services" (ACROSS), the Faculty of Engineering in Rijeka organized Summer School that was held from 27th to 31st May.

The Summer School was held in Opatija, in the Hotel Admiral, as an event collocating with the traditional 39th MIPRO ICT conference.

The summer school was attended by representatives from Belgium, Denmark, Finland, Croatia, Italy, Lithuania, Macedonia, Hungary, Germany, Portugal, Serbia, Slovakia, and Slovenia. Thirteen teachers from leading European universities and leading industries participated in Summer School with a curriculum in the field of telecommunications: Ericsson and Croatian Telecom.

The latest advancements in the field of autonomous management of networks and services were presented with a view of achieving customer satisfaction and reliability dimension. The summer school was designed and intended for young researchers who had also the opportunity to present their research projects within MIPRO conferences, special sessions of the Network and services of the future (Future Network and Services), as well as Telecommunications and information sessions. Professors from leading European universities and experts from leading industries engaged in the domain of network solutions and software technologies were invited to acquaint young researchers and computer science graduate students with the latest technological advances that would significantly affect our lives.

Summer School and special Future Network and Services sessions were organized by the Faculty of Engineering of Rijeka University and scientific research projects of the EU COST Action IC 1304 – the ACROSS project “Autonomous Control for a Reliable Internet of Services” as well as the Croatian Science Foundation through the established research project "Evolving Software Systems: Analysis and Innovative Approaches for Smart Management" (EVOSOFT).





Izlet na otok Cres u sklopu ljetne škole  
/ Excursion to the island of Cres within summer school



Radni dan ljetne škole  
/ A working day at summer school.

## 2.6.5 6. savjetovanje o morskoj tehnologiji the 6th conference on marine technology

Krajem studenoga 2015. godine održano je, šesto u nizu, Savjetovanje o morskoj tehnologiji – in memoriam akademiku Zlatku Winkleru, koje nosi oznaku W6. Djelatnost u području morske tehnologije nije jednostavno opisati jer je ona slojevita, multidisciplinarna i transdisciplinarna, a sadržajem i metodologijom zahvaća više znanstvenih područja. Uvid u te djelatnosti danas se može stići iščitavajući planove rada Sekcije za morskiju tehnologiju kao i izvešća o provedbi istih objavljenih u Ljetopisima HAZU. Jednako tako, te se djelatnosti mogu prepoznati, primjerice, iz Zaključaka znanstvenog savjetovanja „Hrvatsko pomorsko gospodarstvo – danas i sutra, održanog u razdoblju od 17. do 19. studenog 1993. godine u Opatiji. U dijelu koji se odnosi na morskiju tehnologiju, pod točkom 6. se navodi: Morska tehnologija je znanost koja istražuje i proučava tehnološke sustave mora i primorja i djelatnost njihove izgradnje. Polazi se od činjenice da tehnološke sustave čine tehnička sredstva, odgovarajuća prirodna bogatstva (energija, materijal, prostor), ljudi sa svojim stvaralačkim potencijalima te motivacijski i drugi odgovarajući društveni sadržaji što se međusobno povezuju u interakcijsku cjelinu. Njihov je razvoj moguć samo u uvjetima izgrađene tehnološke infrastrukture koju čine izobrazba, znanstvenoistraživačka djelatnost, informatički sustavi, tehnička regulativa i zakonodavstvo u području tehničkog razvoja.

Znanstvenoistraživačka djelatnost ima dvije namjene: jedna prema izgradnji tehnosfere vlastitog mora pa će rezultati istraživanja služiti za iskorištavanje prirodnih bogatstava i svojstava vlastitog mora, a druga je namjena u korištenju rezultata istraživanja za razvoj gospodarskih djelatnosti proizvodnje tehničkih sredstava za iskorištavanje bogatstava svjetskih mora.

Poticanje razvoja morske tehnologije u nas kao znanstvene discipline i kao skup gospodarskih djelatnosti čini dio razvoja pomorskog gospodarstva u nas i upuće na intenzivnu međunarodnu znanstvenotehnološku suradnju i razmjenu znanstvenih i tehnoloških informacija uvrštavajući Hrvatsku u krug pomorskih zemalja svijeta. Razvoju svih tehnoloških sustava morske tehnologije prethode istraživanja mora kao prirodnog sustava i dijela ljudskog okoliša. U skladu s prije spomenutim Pravilnikom i smjernicama koje su nastajale u narednom razdoblju, Sekcija za morskiju tehnologiju danas radi na svim tim područjima. Djelatnost se odvija

The Conference on Marine Technology - in Memoriam of Academician Zlatko Winkler held in late November 2015 was the sixth in a series and therefore defined as Conference Ref No W6. Activities in the field of marine technology are not easy to describe because they are multi-layered, multi-disciplinary and trans-disciplinary so that their content and methodology involve several scientific areas. An insight into these activities can be acquired by reading both the work plans of the Section for marine technology and reports on the implementation of the very same ones that were published in the Croatian Academy Chronicles. Likewise, these activities can be seen clearly, for instance, in the conclusion section of the scientific conference "Croatian Maritime Economy - Today and Tomorrow" that was held in Opatija, in the period from November 17 to 19, in the year of 1993. In the part referring to marine technology, item 6 states: Marine technology is the science that explores and studies technological systems of the sea and its coast as well as activities during their construction. The starting point is the fact that technological systems are made up of technical resources, adequate natural resources (energy, materials, space), people with their creative potentials but also motivation and other appropriate social activities which are interwoven in an interactive whole. Their development is possible only in conditions of well-developed technological infrastructure consisting of education, scientific research activities, information systems, technical regulations and legislation in the field of technological development.

The scientific research activity has two purposes: the first is to build a global structure of the technosphere of our own sea so that research results will be used for the exploitation of natural resources and the characteristics of our own sea, whereas the second is intended to use the results of research aimed at developing economic activities of the production of technical resources to exploit the resources of the world seas.

Incentives designed to meet our specific needs of marine technology as a scientific discipline and as a set of economic activities form a part of the development of our maritime economy and leads to an intense international scientific and technological cooperation and exchange of scientific and technological information incorporating Croatia into the circle of maritime



individualnim radom pojedinih članova, kao i, prema potrebi, zajedničkim djelovanjem više članova Sekcije.

Jedan od vidova djelatnosti je organiziranje stručnih i znanstvenih konferenciјa. Jedna od njih su i Savjetovanja o morskoj tehnologiji, koja se održavaju od 2005. godine svake dvije godine.

Sva savjetovanja organizirana su pod pokroviteljstvom Hrvatske akademije znanosti i umjetnosti. Za prva četiri savjetovanja organizatori su bili akademijino Znanstveno vijeće za pomorstvo čija je Sekcija za morskiju tehnologiju sastavni dio Tehničkog fakulteta Sveučilišta u Rijeci. Za savjetovanje održano 2013. godine organizator je bio samo Tehnički fakultet, a kod posljednjeg se kao suorganizator priključila Udruga za proučavanje i razvoj pomorstva iz Rijeke.

Održavanje savjetovanja finansijski su do sada pomagali sponzori iz gospodarstva, Sveučilište u Rijeci putem Zaklade, Primorsko-goranska županija putem Odjela za pomorstvo, Grad Rijeka putem Odjela gradske uprave za poduzetništvo, Hrvatska gospodarska komora – Županijska komora Rijeka te Ministarstvo znanosti, obrazovanja i sporta.

Od 2005. godine do danas bienalno je organizirano šest Savjetovanja o morskoj tehnologiji – in memoriam akademiku Zlatku Winkleru, i to 2005., 2007., 2009., 2011., 2013. i 2015. godine, tablica 1:

	<b>God.</b>	<b>Broj sudionika</b>	<b>Br. priopćenja</b>	<b>Knj. sažetaka</b>	<b>Zb. radova / ISBN</b>
I.	2005.	47	21	+	963-6326-47-7
II.	2007.	71	26	+	978-953-6326-40-2
III.	2009.	82	32	+	978-953-6326-17-4
IV.	2011.	55	32	+	ISSN 1848-3976
V.	2013.	62	30	web	ISSN 1848-3976
VI.	2015.	51	21	web	ISSN 0554-6397

*Do sada održana Savjetovanja o morskoj tehnologiji  
/ Symposiums on Marine Technology held so far*

Šesto savjetovanje održano je 20. studenoga 2015. godine, kao i ostala, na Tehničkom fakultetu. Organizački odbor savjetovanja bio je u sastavu: dr. sc. Igor Rožanić (počasni predsjednik), prof. dr. sc. Julijan Dobrinić (predsjednik), prof. dr. sc. Tomislav Mrakovčić (tajnik), te članovi doc. dr. sc. Lidija Runko Luttenberger, doc. dr. sc. Siniša Vilke, prof. dr. sc. Bruno Čalić, prof. dr. sc. Nikša Fafandjel, prof. dr. sc. Bernard Franković, prof. dr. sc. Branko Klarin, dr. sc. Gorenka Sinovčić, prof. dr. Zoran Vukić, dr. sc. Alan Klanac i Marko Perčić, mag. ing. mech.

countries. Marine research, namely, research on the sea as a part of the natural system and environment precedes the development of all technological systems of marine technology. In accordance with the aforementioned Regulations and guidelines established for the upcoming period, Section for marine technology runs concurrently in all these areas. This activity can be regarded as creativity of individual members, but also, where appropriate, as joint activities of several members of the Section. One aspect of these activities is the organization of professional and scientific conferences. Some of them are also the Conferences on Marine Technology that have been held every two years since 2005. So far, conferences have been financially supported by sponsors from Economy, by Rijeka University through Croatian Science Foundation, by Primorje-Gorski Kotar County through the Department of Maritime Affairs, by the City of Rijeka through the City Department of Entrepreneurship, by Croatian Chamber of Economy - County Chamber of Rijeka as well as by the Ministry of Science, Education and Sport.

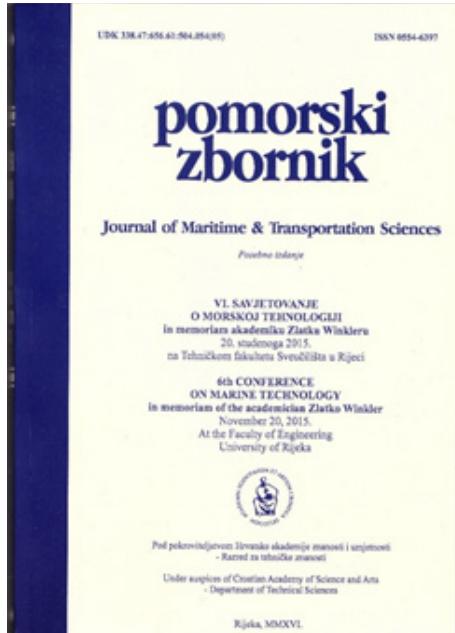
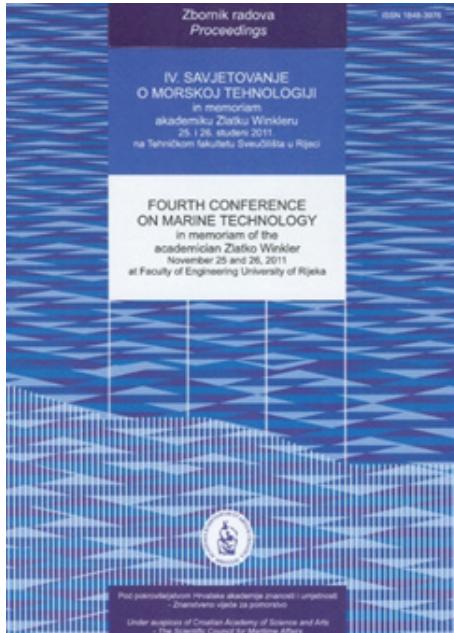
Since 2005 to the present day, six Symposia on Marine Technology - in memoriam of academician Zlatko Winkler have been biennially organised, i.e., in 2005, 2007, 2009, 2011, 2013 and 2015, Table 1:



The sixth symposium (as well as all other symposiums) was held on November 20, in 2015 at the Faculty of Engineering. The Organizing Committee was composed of: Prof. D. Sc. Igor Rožanić (honorary chairman), Prof. D. Sc. Julian Dobrinić (chairman), Prof. D. Sc. Tomislav Mrakovčić (secretary), and members Assist. Prof. D. Sc. Lidija Runko Luttenberger, Assist. Prof. D. Sc. Siniša Vilke, Prof. D. Sc. Bruno Čalić, Prof. D. Sc. Nikša Fafandjel, Prof. D. Sc. Bernard Franković, Prof. D. Sc. Branko Klarin, D. Sc. Gorenka Sinovčić, Prof. Dr. Zoran Vukić, D. Sc. Alan Klanac, and Marko Perčić,

Podneseno je dvadeset i jedno priopćenje iz znanstvenog područja tehničkih znanosti, iz različitih polja i grana, i to: podvodne robotike, energetske nesigurnosti, osnivanje konstrukcije ultravelikih brodova, projektiranja velikih plutajućih aerodroma, pubne opreme, propulzije, stabilitet, inženjerstva okoliša, obnovljivih izvora energije, ribarstva i marmikulture.

MSc. ing. mech. Twenty-one communications were filed from the scientific field of technical sciences, i.e., from various fields and industries including underwater robotics, energy insecurity, development of ultra-large container ship design, large floating aerodrome design, ship bar equipment, propulsion, stability, environmental engineering, renewable energy , fisheries and



Izgled naslovnice Zbornika radova W1-W5 i W6

/ Proceedings Covers of W1-W5 and W6  
aquaculture.

Za prvi pet savjetovanja, zbornik radova je izrađen samostalno, a recenzije su bile napravljene za svaki pojedini Zbornik kao za znanstvenu knjigu. Za posljednje savjetovanje Zbornik je tiskan početkom 2016. godine kao posebno izdanje časopisa Pomorski zbornik, te su za svaki prilog zatražene dvije recenzije. Indeksiran je u TRID bazi podataka navedenoj u Pravilniku za znanstvena napredovanja za područje tehničkih znanosti kao jednoj od baza iz koje se uvršteni članci priznaju kao radovi B kategorije.

Pokroviteljem savjetovanja bila je Hrvatska akademija znanosti i umjetnosti, razred za tehničke znanosti. Javnost rada bila je osigurana objavom kongresnih materijala na web stranicama Tehničkog fakulteta, a promocija je dodatno provedena izradom poštanske omotnice koju je izradilo Filatelističko-numizmatičko društvo Rijeka. Od Hrvatske pošte ishođen

For the first five symposiums, proceedings was designed independently and reviews were written for each Proceedings as for a scientific book. For the latest symposium, Proceedings was printed at the beginning of the year 2016 as a special issue of the journal Maritime Proceedings, and besides, two reviews were requested for every paper. It is indexed in TRID database specified in the Regulations for scientific advancement in the field of engineering sciences as one of the databases whose accepted articles are recognized as Category B papers.

The conference was held under general auspices of the Croatian Academy of Arts and Sciences, Department of Technical Sciences.

The public transparency of the work was ensured by publishing congress materials on the web site of the Faculty of Engineering, while its promotion was enhanced by creating postal envelopes

je poštanski žig koji se rabio samo na dan savjetovanja. Izgled omotnice i žiga dat je na slici 2.

prepared by the Philatelic-Numismatic Society Rijeka. Additionally, the Croatian Post issued the postal stamp that was used only during the symposium day. The envelope and stamp design is shown in Figure 2.



*Prigodna omotnica i žig  
/ Commemorative envelope and stamp*

#### Izvori:

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3. Knjiga sažetaka, II. savjetovanje o morskoj tehnologiji– in memoriam akademiku Zlatku Winkleru, Tehnički fakultet, Rijeka, 2007.
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5. Knjiga sažetaka, III. savjetovanje o morskoj tehnologiji– in memoriam akademiku Zlatku Winkleru, Tehnički fakultet, Rijeka, 2009.
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#### Sources:

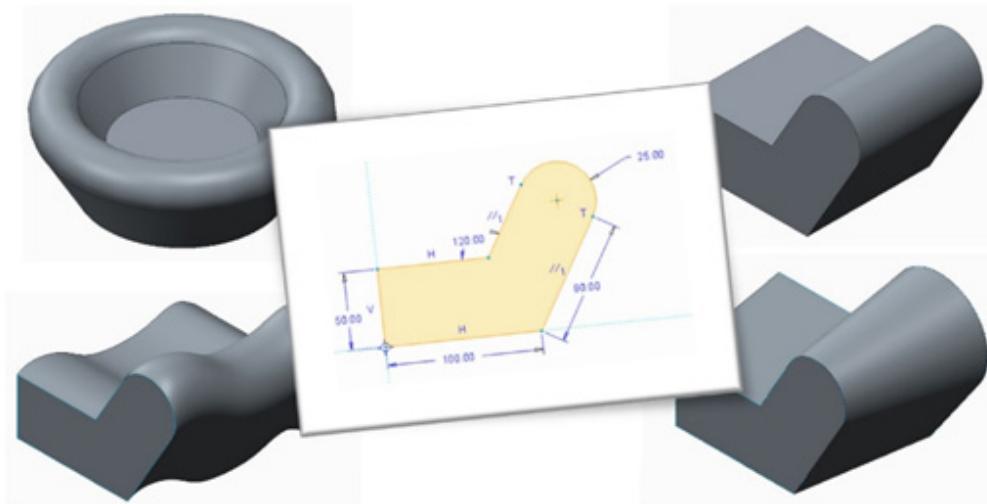
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5. Knjiga sažetaka, III. savjetovanje o morskoj tehnologiji– in memoriam akademiku Zlatku Winkleru, Tehnički fakultet, Rijeka, 2009.
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7. Knjiga sažetaka, IV. savjetovanje o morskoj tehnologiji– in memoriam akademiku Zlatku Winkleru, Tehnički fakultet, Rijeka, 2011..



8. *Zbornik radova IV. Savjetovanja o morskoj tehnologiji – in memoriam akademiku Zlatku Winkleru, Tehnički fakultet, Rijeka, 2012.*
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10. *Zbornik radova VI. Savjetovanja o morskoj tehnologiji – in memoriam akademiku Zlatku Winkleru (Pomorski zbornik - posebno izdanje), Tehnički fakultet i Udruga za proučavanje i razvoj pomorstva, Rijeka, 2016.*
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## 2.6.6 3. Ijetna škola CAD modeliranja the 3rd CAD modelling summer school



Tehnički fakultet Sveučilišta u Rijeci, u suradnji s Prvom sušačkom hrvatskom gimnazijom u Rijeci, organizirao je 3. Ijetnu školu CAD modeliranja, održanu od 27. lipnja do 1. srpnja 2016. godine. Neki od ciljeva bili su stjecanje osnovnih znanja potrebnih za oblikovanje i interpretaciju inženjerske grafike korištenjem tradicionalnih alata i računala te uočavanje važnosti i uloge grafike za vizualizaciju i dokumentiranje. Dodatni poticaj za provedbu Ijetne škole bila je popularizacija znanosti i Tehničkog fakulteta kod učenika srednjih škola, posebno kod polaznika gimnazijalnih programa.

### PROGRAM RADA ŠKOLE

Kroz predavanja i praktični rad polaznici su se upoznali s osnovama tradicionalnih i CAD tehnika pri izradi 2D i 3D geometrijskog modela. Tradicionalne tehnike uključuju skiciranje, a CAD tehnike uključuju programsku opremu za izradu tehničke dokumentacije Autodesk AutoCAD 2015. Polaznicima su također pokazane mogućnosti paketa programske opreme za izradu parametarskih modela PTC CREO 2.0 i 3.0 (prije Pro/ENGINEER). Na kraju rada škole prezentirana im je oprema koja služi za brzu izradu prototipa (3D printer) kao i sama mogućnost primjene formirane baze podataka 3D CAD modela predmeta nastale modeliranjem u sklopu nastave ili korištenjem 3D skenera.

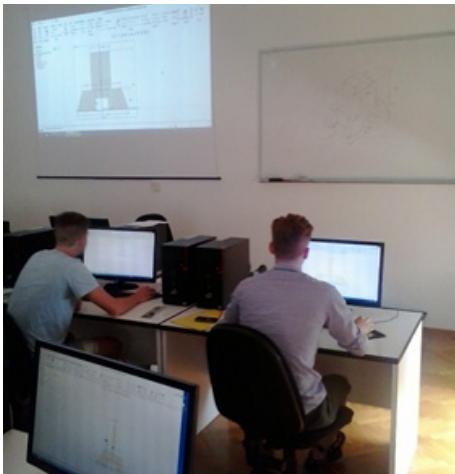
The Faculty of Engineering of Rijeka University organised in collaboration with The First Croatian Grammar School of Sušak in Rijeka the 3rd Summer School in CAD Modelling, which was held from 27 June to 1 July 2016. It was intended to enable the participants to acquire the basic knowledge needed for design and interpretation of the engineering graphics using traditional tools and computers, as well as to appreciate the significance and role of graphics in visualisation and documentation. An additional objective for the organisation of the Summer School was the popularisation of science and promotion of the Faculty of Engineering in high schools, especially grammar schools.

### PROGRAMME OF THE SCHOOL

Through lectures and practical work, the participants were acquainted with the basics of traditional and CAD techniques for creating 2D and 3D geometric models. Traditional techniques include sketching, while CAD techniques include software for creating technical documentation Autodesk AutoCAD 2015. Participants were also presented with the possibilities of the software package for the creation of parametric models PTC CREO 2.0 and 3.0 (formerly Pro/ENGINEER). At the end of the School, they were familiarized with the equipment which is used for fast prototyping (3D printer) and also with the possibility to apply the database of 3D CAD

## POPIS PREDAVAČA

Kao organizatori i predavači u radu škole od 2014. godine sudjelovali su prof. dr. sc. Gordana Marunić, doc. dr. sc. Vladimir Glažar i doc. dr. sc. Goran Gregov, a školu je, do danas, uspješno završilo više od 50 polaznika, uglavnom učenika trećih i četvrtih razreda srednjih škola iz Rijeke i okoline.



model of objects which were modelled within classes or using the 3D scanner.

## LIST OF LECTURERS

As of 2014, Prof. D. Sc. Gordana Marunić, Assist. Prof. D. Sc. Vladimir Glažar and Assist. Prof. D. Sc. Goran Gregov have participated in the activity of the School as organisers and lecturers. Moreover, more than 50 participants have attended the School to date, mainly third- and fourth year high school students from Rijeka and the surrounding area.



## 2.6.7 18. međunarodna regata u mornarskom veslanju the 18th international sailor rowing regatta

Na 18. međunarodnoj regati u mornarskom veslanju, u organizaciji Pomorskog fakulteta u Rijeci, Tehnički fakultet je nastupio s dvije ekipe. Natjecanje je održano 7. lipnja 2016. godine u akvatoriju riječke luke gdje su obje ekipe TFR-a završile na 3. poziciji: prva u kategoriji student, a druga u revijalnom dijelu natjecanja. Ovakav način veslanja je poseban jer se prakticira u čamcima za spašavanje, kojima je, za razliku od takmičarskih čamaca, teže upravljati, a dodatno se naglašava i pomorska tradicija Kvarnera. Time je i Tehnički fakultet dao svoj doprinos Festivalu mora i pomorske tradicije – Fiumare 2016. (1. - 8. lipnja 2016. g.) u sklopu kojega je regata i organizirana.

In the 18th International sailor rowing regatta, organized by the Maritime Faculty of Rijeka, the Faculty of Engineering participated with two crews. The competition was held on June 7, 2016, in the waters of the Rijeka port where both crews of the FE -Rijeka finished third, namely, the former in the category of students and the latter in the senior competition. This type of rowing is special because, firstly, it strongly emphasizes the maritime tradition of Kvarner and secondly, it is practiced in the lifeboats, which, unlike the competing boats, are harder to row (i.e. operate and handle). Thus, it was the Faculty of Engineering which contributed to the Festival of the sea and maritime tradition - Fiumara 2016, and by which it was primarily organized (from 1st to 8th June 2016).



## 2.6.8 jedriličarski kup FSB 2015 sailing cup FSB 2015

Posada Tehničkog fakulteta u sastavu: Vanja Biondić, Dubravko Franković, Vedran Hrvatin, Kristian Lenić, Duško Pavletić i Marko Šestan (kormilar) drugu je godinu za redom osvojila prvo mjesto u monotipskom jedriličarskom natjecanju „Jedriličarski kup FSB 2015“ koje se je od 2. do 4. listopada 2015. godine održalo u akvatoriju otoka Ugljana u organizaciji Sveučilišnog nautičkog kluba Fakulteta strojarstva i brodogradnje Sveučilišta u Zagrebu. Na natjecanju je sudjelovalo ukupno 8 posada s hrvatskih sveučilišta koje su svoje umijeće odmjerili po promjenjivim vremenskim uvjetima u ukupno 8 plovova („štap“). O pobjedniku kupa odlučivalo se u posljednjem 8. plovu, kada je posada Tehničkog fakulteta taktički nadigrala drugoplasiranu posadu i time obranila naslov iz 2014. godine. Plovilo se na jedrilicama Elan 333.

Members of the crew: Vanja Biondić, Dubravko Franković, Vedran Hrvatin, Kristian Lenić, Dusko Pavletić and Marko Šestan (helmsman), for the second year in a row, won the first place in the monotype regatta "Sailing Cup FSB 2015" which lasted from the 2nd to the 4th of October 2015 held in the waters of the island Ugljan. The competition was organized by the University nautical club of the Faculty of Mechanical Engineering and Naval Architecture, University of Zagreb. A total of 8 crews participated in the competition. The crews were formed by academics and students from Croatian universities that have their skills measured in a total of 8 races of the "Windward/Leeward" type with variable weather conditions. The overall winner of the Cup was decided in the last race, when the crew of the Faculty of Engineering tactically defeated the second placed crew and thus defended the 2014 title. The crews sailed on the Elan 333 sailboat.





ANJA

ela

## 2.6.9 hrzz projekti

## hrzz projects

### NAZIV RADA | TITLE:

RAZVOJ EVOLUCIJSKIH POSTUPAKA ZA KARAKTERIZACIJU PONAŠANJA BIOLOŠKIH TKIVA  
DEVELOPMENT OF EVOLUTIONARY PROCEDURES FOR CHARACTERIZATION OF  
BIOLOGICAL TISSUES BEHAVIOR – BIOMAT

#### Glavni istraživač

Izv. prof. dr. sc. Marina Franulović, Tehnički fakultet, Sveučilište u Rijeci, Hrvatska

#### Članovi istraživačkog tima

Izv. prof. dr. sc. Robert Basan, Tehnički fakultet, Sveučilište u Rijeci, Hrvatska  
dr. sc. Kristina Marković, poslijedoktorand, Tehnički fakultet, Sveučilište u Rijeci, Hrvatska  
Tea Marohnić, poslijediplomant, Tehnički fakultet, Sveučilište u Rijeci, Hrvatska  
prof. dr. sc. Ivan Prebil, Fakulteta za strojništvo, Univerza v Ljubljani, Slovenija  
dr. sc. Ana Trajkovski, Fakulteta za strojništvo, Univerza v Ljubljani, Slovenija  
Senad Omerović, poslijediplomant, Fakulteta za strojništvo, Univerza v Ljubljani, Slovenija  
dr. sc. Simon Krašna, Fakulteta za strojništvo, Univerza v Ljubljani, Slovenija



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#### Sažetak projekta

Za proces pravilnog konstruiranja i oblikovanja proizvoda vrlo je značajan optimalan izbor materijala, pri čemu posebnu pažnju treba posvetiti ponašanju materijala u stvarnim uvjetima primjene.

U cilju poboljšanja i unaprijeđivanja značajki proizvoda, u inženjerstvu se sve veća pažnja posvećuje poboljšanju značajki konvencionalnih, a posebice razvoju inovativnih materijala te stvaranju pretpostavki za njihovu tehničku primjenu. Iako je područje istraživanja materijala i dalje u značajnoj mjeri usmjereno na metalne, polimerne materijale, staklo, keramiku, kompozite itd., sve veći interes posvećuje se istraživanju bioloških i njima sličnih materijala zbog izvrasnih svojstava i ponašanja pri različitim uvjetima i opterećenjima. Mnogi biološki sustavi imaju mehaničke karakteristike koje uvelike nadvisuju one koje se mogu ostvariti korištenjem konvencionalnih i sintetičkih materijala pa se u tom smislu vrše intenzivna istraživanja mehaničkih svojstava i ponašanja materijala prisutnih u, primjerice, školjkama, mekušcima, kostima, paukovoj svili, mišićima i slično.

#### Principal investigator

Assoc. Prof. D. Sc. Marina Franulović, Faculty of Engineering, University of Rijeka, Croatia

#### Team members

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D. Sc. Kristina Marković (postdoc), Faculty of Engineering, University of Rijeka, Croatia  
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Prof. D. Sc. Ivan Prebil, Faculty of Mechanical Engineering, University of Ljubljana, Slovenia  
D. Sc. Ana Trajkovski, Faculty of Mechanical Engineering, University of Ljubljana, Slovenia  
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D. Sc. Simon Krašna, Faculty of Mechanical Engineering, University of Ljubljana, Slovenia

#### Project summary

For the proper product design optimal material selection is very significant, whereby special attention should be paid to the behavior of materials under actual conditions of use.

In order to enhance and improve product features, increasing attention is paid to enhancing the properties of conventional and, especially the development of innovative materials and creating conditions for their technical applications. Although the materials research is still to a large extent focused on metallic, polymeric materials, glass, ceramics, composites, etc., increasing interest is devoted to the study of the biological and the like materials with excellent properties and behavior under different conditions and loads. Many biological systems have mechanical characteristics that are greatly above those that can be achieved using conventional and synthetic materials, so mechanical properties and behavior of materials present in, for example, clams, mussels, bone, spider silk, the muscles and the like are intensely studied.

Ponašanje bioloških materijala vrlo je kompleksno, ali se, kao i modeliranje ponašanja konvencionalnih materijala, bazira na poznavanju njihovih osnovnih mehaničkih karakteristika kao što su međuvisnost naprezanja i deformacije materijala. Neke od ovih karakteristika moguće je odrediti eksperimentalnim postupcima poput vlačnog opterećenja uzoraka do njihovog loma. Pored poznavanja matematičkog, odnosno materijalnog modela kojim je moguće dobro opisati spomenute međuvisnosti, osnovni preduvjet za modeliranje ponašanja bioloških materijala svakako je identifikacija njihovih parametara bazirana na fizikalnim zakonitostima koji se na njih primjenjuju.

Zbog složenosti modela bioloških materijala te velikog broja materijalnih parametara koji se u njima pojavljuju, za njihovo određivanje nisu dostačne konvencionalne računske metode. U okviru prethodnih istraživanja, ustanovljeno je da je za identifikaciju parametara bioloških materijala potrebnih za modeliranje i simuliranje njihovog ponašanja preporučljivo primjeniti evolucijske metode, a posebno genetski algoritam.

U okviru projekta, za karakterizaciju i modeliranje ponašanja bioloških materijala koristit će se podaci dobiveni eksperimentalnim testiranjem uzorka vratnih ligamenata ljudske kralježnice. Kao prikladan, odabran je hiperelastični materijalni model koji se može koristiti i za kompresibilne i nekompresibilne materijale. Kako bi se na što efikasniji način dobile što točnije vrijednosti parametara za predloženi nelinearni hiperelastični materijalni model, razvit će se tehnika određivanja parametara ponašanja materijala temeljena na genetskom algoritmu. Radi razvoja što boljeg genetskog algoritma i njegove optimizacije za zadani materijal ili skupinu materijala, odnosno što bržeg ostvarenja traženog rješenja, razvit će se procedura složenog genetskog algoritma te njegovi operatori, uz primjenu adekvatne funkcije cilja optimizacijskog postupka. Sam postupak će se automatizirati primjenom adekvatnih matematičkih i numeričkih postupaka.

Predložena metodologija karakterizacije ponašanja materijala već se dosad pokazala vrlo primjenjivom za identifikaciju parametara materijala različite strukture i mehaničkih karakteristika. Očekuje se da će je, zbog njene fleksibilnosti i robusnosti, osim za modeliranje ponašanja bioloških materijala biti moguće primjeniti za karakterizaciju ponašanja i drugih

The behavior of the biological material is very complex, but, as well as modeling of the conventional material it is based on the knowledge of their mechanical properties, such as the interdependence between the stress and strain of the material. Some of these characteristics may be determined by experimental methods such as tensile loading of samples to their cracking.

In addition to knowledge of mathematical and material model which can be well described by the aforementioned interdependence, a basic prerequisite for modeling the behavior of biological materials, is certainly the identification of their parameters, based on physical laws that apply to them.

Due to the complexity of the model of biological materials and a large number of material parameters that appear in them, conventional calculation methods are not sufficient for their determination. In preliminary studies, it was found that for the identification of parameters of biological materials needed for modeling and simulation of their behavior, it is advisable to apply the evolutionary methods, especially genetic algorithm.

Within the project, for the characterization and modeling of biological materials, the data obtained through experimental testing of samples of cervical ligaments of the human spine will be used. Hyperelastic material model that can be used for both compressible and incompressible materials was selected as appropriate. In order to more efficiently obtain the precise values of the parameters for the proposed nonlinear hyperelastic material model techniques for determining the parameters of material behavior based on genetic algorithm will be developed. In order to develop the best genetic algorithm and to optimize it for the given material or group of materials, and to achieve desired solutions as soon as possible, complex genetic algorithm procedures and its operators, will be developed applying the appropriate objective function for the optimization procedure. The procedure will be automated by using the appropriate mathematical and numerical methods.

The proposed methodology of material characterization, has so far proved to be very applicable for parameters identification of material with differenet microstructure and mechanical properties. It is expected that because of its flexibility and robustness, besides



nekonvencionalnih i inovativnih materijala kompleksnog ponašanja. U tu svrhu predviđeno je prikupljanje i sistematizacija relevantnih rezultata eksperimentalnih ispitivanja naprednih vrsta materijala te informacija o primjenjenim metodologijama i materijalnim modelima. Time će se stvoriti pretpostavke i temelji za daljnje unaprijeđivanje razvijenog rješenja te stvaranje jedinstvene metodologije za karakterizaciju velikog broja inovativnih materijala i olakšavanje njihove primjene u inženjerskoj praksi.

Ovaj prijedlog projekta predstavlja postavljanje inovativnih temela u interdisciplinarnom području tehničkih znanosti i biomedicine te omogućava povezivanje članova predložene znanstvene skupine i osigurava njihovu međunarodnu vidljivost te općenito razvoj znanosti u Hrvatskoj u području istraživanja materijala.

for the modeling of the biological material it can be applied to characterize the behavior and other non-conventional and innovative materials of complex behavior. For this purpose, collection and systematization of relevant results of experimental tests of advanced types of materials and information on the methodology and material models is foreseen and planned. This will create the basis and foundation for the further improvement of the developed solutions and the creation of a unified methodology for the characterization of a large number of innovative materials and facilitate their application in engineering practice.

This project proposes setting innovative foundations in the interdisciplinary field of engineering sciences and biomedicine, allows the connection of members of the proposed scientific groups and ensures their international visibility and contributes to the overall development of the field of material research in Croatia.

#### **NAZIV RADA | TITLE:**

PROGRAMSKI SUSTAVI U EVOLUCIJI: ANALIZA I INOVATIVNI PRISTUPI PAMETNOM UPRAVLJANJU

EVOLVING SOFTWARE SYSTEMS: ANALYSIS AND INNOVATIVE APPROACHES FOR SMART MANAGEMENT – EVOSOFT

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#### **Sažetak projekta**

Kompleksni programski sustavi koji se evolucijski razvijaju (EVOSOFT) postali su središnji sve većeg broja aplikacija, proizvoda i usluga, a koji su potpora svakodnevnim ljudskim

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#### **Project summary**

Evolving complex software systems (EVOSOFT) have become a central part of a rapidly growing range of applications, products

aktivnostima iz svih gospodarskih sektora. Često su to distribuirani sustavi, heterogeni, decentralizirani i međusobno zavisni, koji rade u dinamičnim i nepredvidljivim uvjetima, pa su njihova dostupnost i pouzdanost postale ključna svojstva potrebna za njihov rad i budući razvoj. Novo i još neistraženo područje istraživanja a koje se obrađuje u ovom projektu je razumjeti kako apstraktnе programske strukture i lokalna obilježja sustava utječu na distribuciju neispravnosti, a čime se utječe na kritična svojstva sustava, među kojima je dostupnost i pouzdanost te razvijati inovativne pristupe za pametno upravljanje njihovim izvođenjem i evolucijom. Potrebno je za naglasiti da se ovdje suočavamo s potpuno novim pojavama, sličnim ljudskoj evoluciji, ali koje su proizvedene ljudskim intelektom. Temelji i teorije iz drugih disciplina kojima je cilj razumjeti ponašanje kompleksnih sustava, evolucije te ljudsko razmišljanje mogle bi ovdje biti primjenjive. Novi rezultati otvoriti će nove mogućnosti u mnogim znanstvenim područjima, osobito u teoriji kompleksnih sustava i njenih primjena, te tako međudjelovati sa širokim spektrom znanosti, od prirodnih znanosti kao što su to biomedicina pa sve do društvenih znanosti. Industrijsko iskustvo prikupljeno iz empirijskog pristupa programskom inženjerstvu je iznimno važno za daljnji razvoj discipline programskog inženjerstva. Nove teorije ne mogu biti djelotvorne i primjenjive u industriji, bez temeljnog razumijevanja EVOSOFT ponašanja. Glavni cilj ovog projekta je da će ispuniti taj jaz između empirijskih dokaza i teoretskih modela. Kako bi ostvarili taj cilj kombiniramo empirijska i teoretska znanja tako što ćemo:

- ponoviti studije i potvrditi empirijske principe i metode i na kojima želimo graditi nove teorije,
- definirati strukturalne ovisnosti za primjenu empirijskih principa, metoda,
- definirati formalne modele i inovativne načine pametnog upravljanja.

#### **NAZIV RADA | TITLE:**

**ZELENIJI PRISTUP PROJEKTIRANJU BRODA I OPTIMALNOM PLANIRANJU RUTE  
GREENER APPROACH TO SHIP DESIGN AND OPTIMAL ROUTE PLANNING – GASDORP**

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and services supporting daily human activities from all economic sectors. As they are often distributed, heterogeneous, decentralized and inter-dependent, and operating in dynamic and unpredictable environments, availability and reliability become key properties for its operation and future evolution. The novel and still unexplored area of research addressed in this project is to understand how abstract software structures and local system properties influence fault distributions, thus affecting mission critical system properties, among which availability and reliability and to develop innovative approaches for smart management of their operation and evolution. We are facing with completely new phenomena, similar to human evolution, but produced by human intellect. Foundations and theories from other disciplines aiming to understand complex system behavior, evolution and human reasoning could be applied. New findings would open new opportunities in many scientific fields, especially in complex systems theory and its applications, thus interacting with a wide spectrum of sciences, from natural sciences such as biomedicine to social sciences. Industrial experience gathered by systematic Empirical Software Engineering approach is extremely important for further evolution of software engineering discipline. New theories cannot provide effective means for industry without fundamental understanding of EVOSOFT behavior. The main aim of this project is to fulfill this gap between empirical evidence and theoretical models. In that aim we combined empirical and theoretical skills aiming to:

- replicate studies and confirm empirical principles and methods and define a solid base to ground new theories,
- define structural dependencies for applicability of empirical principles, methods,
- define formal models and innovative approaches for smart management



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### Sažetak projekta

Točan izračun održive brzine broda u stvarnim uvjetima na moru važan je iz ekonomskih i ekoloških aspekata. Pouzdana procjena gubitka brzine broda u stvarnim uvjetima okoliša omoguće točnija predviđanja povećanja snage i potrošnje goriva kao i emisija plinova. Tehnološka poboljšanja na brodovima kao što su poboljšani dizajn trupa, unapređenje energetskih i pogonskih sustava mogla bi potencijalno smanjiti emisiju CO<sub>2</sub> do 35%. Ove se mjere djelotvorno može kombinirati s drugim operativnim mjerama, kao što su optimalno planiranje rute.

Predloženo se istraživanje provodi u tri glavna područja: 1. Poboljšanje metodologije procjene brzine broda, potrošnje goriva i emisije stakleničkih plinova u stvarnim vremenskim uvjetima, 2. optimizacija brodskog trupa i brodskog porivnog sustava koji rade u stvarnom vremenskim uvjetima, 3. optimizacija plovidbene rute uzimajući u obzir sve relevantne parametre.

Cilj je poboljšati značajke broda vodeći računa o pitanju zaštite okoliša, stvaranje tzv eko-činkovitog ili "zelenog" broda.

### Project summary

The accurate calculation of attainable ship speed at actual sea is essential from economical and also environmental aspects. Reliable ship speed loss estimation under real environmental conditions allows a more accurate prediction of the power increase and fuel consumption as well as gas emissions from ships. Nowadays this second issue becomes very important because of the problem of global warming. Following the increasing awareness of the environmental and human health concerns of shipping, legislative actions have been taken on global and national levels making mandatory (from January 1st 2013) that new ships over 400 gross tonnage, to comply with the regulations, should have emissions of CO<sub>2</sub> under limiting value. Technological enhancement to ships like improved hull designs as well as improvement in power and propulsion systems could potentially reduce CO<sub>2</sub> emission up to 35 %. These measures could effectively be combined with several other operational measures, such as weather routing and voyage planning, in order to ensure that fuel consumption and CO<sub>2</sub> emissions from ships are minimized on every voyage.

The proposed research will be conducted in three main areas: 1. Improvement of the methodology of ship speed, fuel consumption and greenhouse gases (GHG) emissions (especially CO<sub>2</sub>) calculation on actual weather conditions, 2. Optimization of the ship hull (bow and stern) and ship propulsion system operating in actual weather condition, 3. Optimization of ship route by taking into account all relevant parameters: weather prediction, attainable ship speed on waves, main engine performance and



navigation constrains.

The objective is to improve ship design and performance taking into accounts the environmental issue, creating a so called eco-efficient or "green" ship design. The project team consists of the scientists who are experts in the naval architecture, mechanical engineering and marine engineering field which allow solving this problem multidisciplinary.

#### **NAZIV RADA | TITLE:**

OPTIMIZIRANJE I MODELIRANJE TERMALNIH PROCESA MATERIJALA

OPTIMISATION AND MODELLING OF THERMAL PROCESSES OF MATERIALS – OMOTPOM

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**Sažetak projekta**

Termalni procesi materijala među najvažnijim su čimbenicima u proizvodnji i povećanju pouzdanosti inženjerskih komponenti. Termalni procesi poput topinske obrade, lijevanja, oblikovanja u vrućem stanju i zavarivanja omogućuju proizvodnju komponenti zahtijevanog oblika i zahtijevanih svojstava. Cilj optimiziranja i modeliranja termalnih procesa materijala je razvoj modela i računalnih simulacija termalnih procesa materijala te primjene alata i kalupa u termalnim procesima.

Tijekom termalnih procesa materijala proučavat će se prijenos topline, mikrostruktурне pretvorbe, mehanička svojstva te distorzije i zaostala naprezanja, za što je potreban ujedinjeni termomehaničko-metallurški pristup.

Razvit će se računalni programi za simulaciju prijenosa topline, mikrostrukturnih transformacija, mehaničkih svojstava, distorzija i zaostalih naprezanja. Programi će se razvijati uzimanjem u obzir zahtijevanog oblika obratka, zahtijevane raspodjеле mehaničkih svojstava i raspodjelu mikrostrukture, a pritom uz zahtjeve izbjegavanja pukotina i minimiziranja distorzija i zaostalih naprezanja.

**Project summary**

Thermal processing of materials is one of the most important factors in production and reliability of engineering components. All varieties of material thermal processing technology, from heat treatment, casting and hot metal forming, to the welding, not only manufactures workpieces of required shapes but also optimizes their final properties. Objective of the optimisation of thermal processes of materials is development of models and computer simulations of thermal processes of materials and study of optimizing the application of tools and dies in thermal processing of materials.

During the thermal processing, physical processes and material properties such as: heat transfer, microstructure transformations, mechanical properties and distortions and residual stresses will be studied primarily. To solve these tasks, joined thermo-mechanic-metallurgical approach will be required. The computer program for simulation of heat transfer, microstructure transformations, mechanical properties, distortions and residual stresses during the thermal processes will be analyzed.

To meet the needs of industry to control and optimize the thermal process parameters, developed computer programs for simulation of the thermal processes will be accomplished by considering the achievement of: Required workpiece shape; Desired mechanical property distribution; Desired microstructure distribution by: Avoidance of cracking; Reduction of both distortion and residual stresses.

**NAZIV RADA | TITLE:**

PROCJENA PONAŠANJA KONSTRUKCIJA U GRANIČNIM UVJETIMA RADA  
ASSESSMENT OF STRUCTURAL BEHAVIOUR IN LIMIT STATE OPERATING CONDITIONS -  
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### Sažetak projekta

Cilj projekta opisati je ponašanje konstrukcija u graničnim uvjetima rada. Pritom se istraživanja provode pomoću eksperimentalnih i numeričkih metoda. Stoga projekt namjerava pružiti procjenu ponašanja konstrukcija uspoređujući parametre poput naprezanja, deformacije, pojave pukotina itd., a koje su uzrokovane određenim razinama naprezanja i temperaturama na ovakvim graničnim stanjima s dopuštenim značajkama materijala. Da bi se ovakva procjena ponašanja konstrukcija mogla i provesti, potrebno je istražiti sljedeće podciljeve: ispitivanje značajki materijala za različite okolišne uvjete; definiranje udarne energije kao i određivanje sile propagacije pukotine i životnog vijeka elemenata konstrukcija; procjena ponašanja polukrutihih konstrukcijskih spojeva; razvoj numeričkih algoritama za optimizacije konstrukcija sa polukrutim spojevima; pravilno konstitutivno modeliranje u uvjetima graničnih uvjeta rada (poput plastičnosti, oštećenja, termomehaničke sprege); primjena novih materijala u graničnim uvjetima rada – nanokompozita. Ciljane konstrukcije mogu biti čelične građevine, stupovi dalekovoda za prijenos električne energije, brodske strukture, strojevi i slično.

U prve dvije godine projekta, ostvareni su glavni rezultati: u području eksperimentalnih istraživanja kratkotrajnog puzanja čelika, istraživački je tim uspješno izveo takve studije na čelicima X6CrNiTi18-10, X15CrNiSi25-20, 1.7225 i 1.7147. Nadalje, napravljeni su i vlačni testovi i Charpyev test istih čelika, kao i ispitivanje zamora X6CrNiTi18 čelika. Propagacija pukotina u čelicima AISI 303 i AISI 316Ti također je istraživana. Dodatni je napredak ostvaren u analizama polukrutihih veza okvira, gdje je nova procedura primijenjena na kompozitne okvire. Termomehanički višerazinski postupci također su razvijeni, i to posebice za područje termoplastičnosti u uvjetima velikih deformacija. U području nanomehanike,

### Project summary

The project aims to describe the structures operating in limit state conditions. The studies are performed by experimental and numerical research methods. Therefore, the main objective is to provide an assessment of structure behavior, by comparing of the parameters such as stress, strain, crack occurrence, etc., caused by certain load level and temperature at this unexpected limit state with those allowed by material properties. To assess structural behavior in operation at limit state, the following research sub-objectives should be accomplished: testing of material properties for the different environmental conditions; definition of impact energy as well as the determination of the crack driving force and life assessment of structural elements; evaluation of the semi-rigid structural joints/connections behavior; development of a numerical algorithm for optimization of semi-rigid framed structures; creep buckling simulations of composite beam-type structures; proper constitutive modelling at limit operating conditions (i.e. plasticity, damage, thermomechanical coupling); application of new materials to be used at limit state – nanocomposites. Targeted structures may be single and multi storey steel buildings, high-power electrical transmission towers, ship structures, machines, etc.

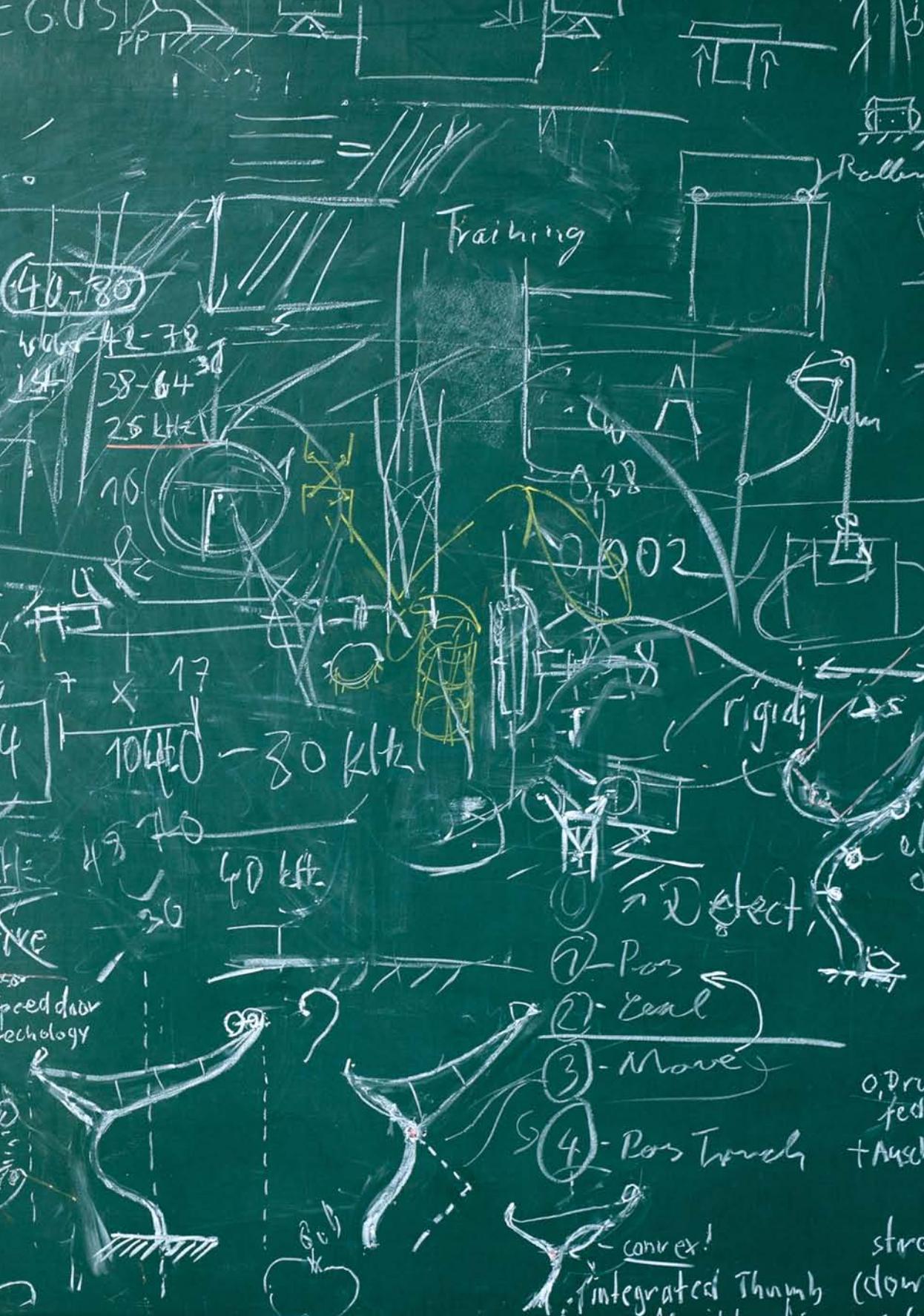
In the first two years of the project, main research results can be stated as follows. In the domain of the experimental research of short-time creep of steels, the research team successfully performed studies of X6CrNiTi18-10, X15CrNiSi25-20, 1.7225 and 1.7147 steels. Besides that, tensile testing and Charpy impact behaviour of same steels were performed, as well as fatigue characterization of X6CrNiTi18-10 steel. Crack propagation in steels AISI 303 and AISI 316Ti was also researched. Additional progress was made in the analysis of semi-rigid frame connections where the new procedure was applied to



istraživane su interakcije ugljičnih nanocijevi i epoxya. Nelokalne nanogredne formulacije prikladne za nanosenzoriku su također razvijene. Ukupno su publicirana dvadeset i dva rada u časopisima, od toga deset radova u prvoj kvartili prema ISI Thomsonu. Članovi tima održali su i pet prezentacija na kongresima.

composite frames. Theromechanical framework for the multiscale analysis of structures was developed, especially for the large strain thermoplasticity. In the nanomechanics field, carbon nanotube and epoxy interactions were investigated. Nonlocal nanobeam formulation suitable for nanosensorics were developed. In total, 22 journal papers were published, among them 10 papers in the first quartile according to ISI Thomson. Also 5 conference presentations were delivered





# 2.6.10 studentski završni i diplomski radovi

## student undergraduate and graduate theses

**IME I PREZIME | NAME AND SURNAME:**

Janko Salom

Diplomski sveučilišni studij brodogradnje / Graduate University Study of Naval Architecture

**NAZIV RADA | TITLE:**

Optimizacija izrade panela u brodogradilištu korištenjem vitke metodologije  
Optimization of panel assembly using a lean methodology

**MENTOR(I) | SUPERVISOR(S):**

prof. dr. sc. / Prof. D. Sc. Nikša Fafandjel  
v. asistent dr. sc. / S. Assistant D. Sc. Damir Kolić

Sažetak:

U radu je analizirana linija za izradu panela u realnom brodogradilištu, kao jednom od temeljnih proizvodnih procesa, radi iznalaženja optimalne metode povećanja njene efikasnosti. Kako se više od 60 % brodskih međuproizvoda sastoji od panela, bilo koja poboljšanja u ovom sustavu ishodit će značajne uštede brodogradilištu. Primjena mapiranja toka vrijednosti služi identificiranju protočnosti međuproizvoda, aktivnosti s dodanim vrijednostima i gubitaka. Push, prekomjerna skladištenja te previše nepotrebnih pokreta predstavljaju neke od gubitaka koje treba eliminirati zbog omogućavanja glatkog protoka međuproizvoda u procesu sastavljanja panela.

Prikazana su načela vitke proizvodnje i analizirano je sadašnje stanje navedenih proizvodnih linija. Mapirani su tokovi proizvodnje korištenjem VSM (eng. Value stream mapping) metode. Identificirano je taktno vrijeme, broj radnika i pripadajuće struke svakog radnika po pojedinoj postaji. Kalkulirani su realni sati rada i vrijeme trajanja svakog procesa izrade tipičnog panela i kompletiranog panela. Radni zadaci su raščlanjeni prema PWBS (Product work breakdown structure) metodi kroz izradu detaljnih gantograma. Provedene su odgovarajuće analize sadašnjeg stanja temeljem kojih su izrađene poboljšane mape budućeg načina sastavljanja panela i kompletiranih panela, gdje je pull načelo zamjenilo pus, dok su kanban sustavom eliminirana postojeća međusklađišta. Nadalje, izbalansirana su taktna vremena i eliminirano je usko grlo na četvrtoj radnoj postaji korištenjem just in time načela. Uz minimalne preinake optimizirani su načini sastavljanja panela i kompletiranih panela.

Summary:

The aim of this paper was to analyze a core shipbuilding process, the panel line assembly process of a real shipyard with the purpose of determining how to make it more efficient. Since more than 60% of the ships weight is made up of panels, any types of improvements to this system will result in considerable man-hour savings for the shipyard. Applying the method of value stream mapping is done to identify the way that the interim products flow, the added value activities and where there is waste. Push, excessive storage and excessive unnecessary movements are some of the wastes that need to be removed in order to enable a smooth flow in the panel assembly process.

The principles of lean manufacturing are explained and the current states of the production lines are analyzed. The production flow was mapped using VSM (value stream mapping) methods. The takt time, number of workers and their trades per each workstation were identified. The actual man-hours and the duration time of each process of panel and built-up panel assembly lines were calculated. The work activities were broken down according to the PWBS (Product work breakdown structure) method through detailed Gantt chart creation. The proper analysis of the current state maps enabled the creation of the future improved value stream maps of panel and built-up panel assembly, where the pull principle replaced push and kanban system eliminated the interim storage areas. The takt times of the workstations were equalized and the bottleneck at workstation four was eliminated through the application of the Just in time principle. With minimal alterations, panel and built-up panel assembly was optimized.



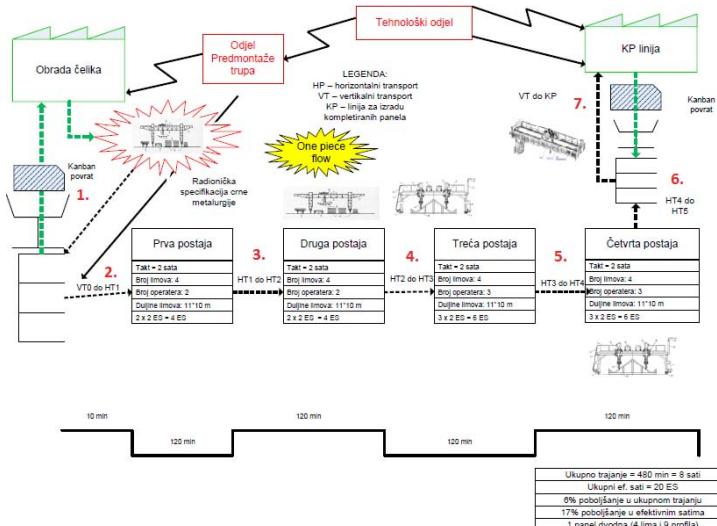
Jasno su prikazani načini funkciranja linije za izradu panela i kompletiranih panela. Utvrđen je „common denominator“ zbog korištenja takve metode za poboljšanja proizvodnih linija i na primjerima drugih brodogradilišta. Izrađena je studija slučaja realnog broda za prijevoz kemikalija i naftnih derivata. Rezultati pokazuju uštede u načinu sastavljanja panela od 6 % za vrijeme trajanja proizvodnog procesa te 17 % za smanjenje efektivnih sati rada. Za kompletirane panele poboljšanja su još značajnija i iznose 21 % za ukupno trajanje izrade i 13.5 % za efektivne sate rada.

The explanation of panel and built-up panel assembly is clearly explained, and the „common denominator“ to explain how this method could be applied to improving the production lines of other shipyards was discussed. A case study of a real tanker for the transport of chemicals and heavy fuel oil derivatives was developed. The results show that for panel assembly the savings are 6% for duration time and 17% for decreasing man-hours. For built-up panels they are more significant and equate to 21% savings for duration time and 13.5% for man-hours.



### Kutno obostrano zavarivanje profila panela na četvrtoj radnoj postaji korištenjem eletrolučnog zavarivanja pod praškom

/ Two sided fillet welding of a stiffener to a panel at workstation #4 using submerged arc welding technology



Mapa toka vrijednosti linije za izradu panela – buduće poboljšano stanje  
 / Value stream map of the panel assembly line – future improved state

**IME I PREZIME** | NAME AND SURNAME:  
Filip Žic

Preddiplomski stručni studij elektrotehnike / Undergraduate Vocational Study of Electrical Engineering

**NAZIV RADA** | TITLE:  
Primjer projektiranja izvora napajanja  
Case Study: Power Supply Design

**MENTOR(I)** | SUPERVISOR(S):  
doc. dr. sc. / Assist. Prof. D. Sc. Saša Sladić

Sažetak:

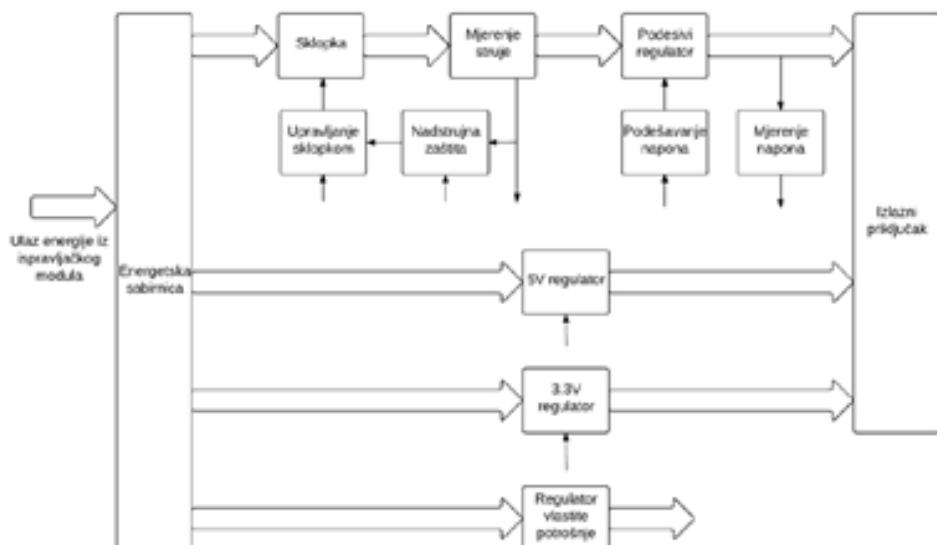
U radu je prikazan pristup projektiranju izvora napajanja (20 W) s višestrukim naponskim izlazima (3,3 V, 5 V) od kojih je jedan podešiv do 5 V, a druga dva nisu. Za podešavanje napona se koriste rotacijski enkoder i tri tipkala. Tiskana pločica je izrađena fotopostupkom kojem je prethodilo idejno rješenje i odabir mikrokontrolera (PIC) i ostalih električnih komponenta. Učinski pretvarač ima mrežno napajanje (230 V, 50 Hz).

Summary:

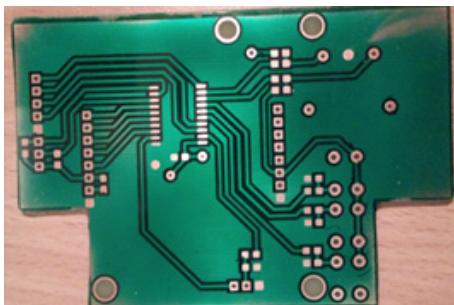
Power converter (20W) with three outputs has been designed. Its output voltage is regulated at 5V (or lower) other two outputs are on constant voltage (3,3V and 5V). Printed circuit board has been made by photolithography. Before that a microcontroller (PIC) has been chosen in order to control switching of power converter and output voltage as well. Input voltage of power converter is 230V, 50Hz.



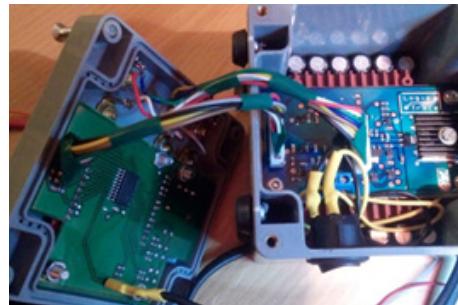
62



Blok shema izvora napajanja  
/ Power supply schematic



Tiskana pločica upravljačkog modula  
/ Printed circuit board of control circuit



Pogled u unutrašnjost izvora napajanja  
/ Inside look of power supply prototype

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File Edit View Document Comments Forms Tools Advanced Window Help
Create • Combine • Collaborate • Secure • Sign • Forms • Multimedia • Comment •
[ ] / 55 | 150% | Find
interrupt: ;Interrupt subrutina
    if re_1 = 0 then ;Provjera izvora interupta
        do
            if re_1 = 1 then ;Cekanje drugog bita kodera
                exit
            endif
        loop
        if re_2 = 0 then ;Provjera smjera rotacije
            gosub povecanje ;Smjer kazaljke na satu
        else
            gosub smanjenje ;Suprotan smjer kazaljke
        endif
        do
            if re_2 = 1 then ;Cekanje kraja rotacije
                exit
            endif
        loop
    else
        if sw_1 = 1 then ;Provjera izvora interupta
            ;Tipkalo 1
            gosub Tipkalol
        endif
        if sw_2 = 1 then ;Tipkalo 2
            gosub Tipkalol2
        endif
        if sw_3 = 1 then ;Tipkalo 3
            gosub Tipkalol3
        endif
    endif
    gosub UkljuciInterrupt ;Uključenje interupta

```



Segment kôda napisan u programskom jeziku BASIC prilagođen mikrokontroleru Picaxe 20X2  
/ Part of a program code written in Basic programming language for PIC microcontrollers

**IME I PREZIME** | NAME AND SURNAME:  
Mateo Šafaric

Preddiplomski stručni studij elektrotehnike / Undergraduate Vocational Study of Electrical Engineering

**NAZIV RADA** | TITLE:  
Pristup programiranju djelovanja mosnog izmjenjivača  
H-Bridge Programming Approach for Inverter Applications

**MENTOR(I)** | SUPERVISOR(S):  
doc. dr. sc. / Assist. Prof. D. Sc. Saša Sladić

Sažetak:

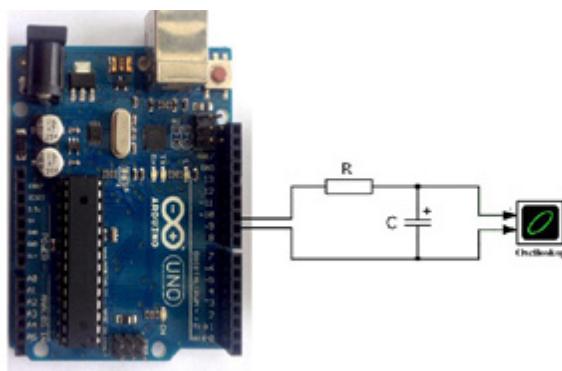
U radu su opisani, simulirani i generirani upravljački signali za jednofazni izmjenjivač. Umjesto učinskog izmjenjivača, korišten je njegov model.

Summary:

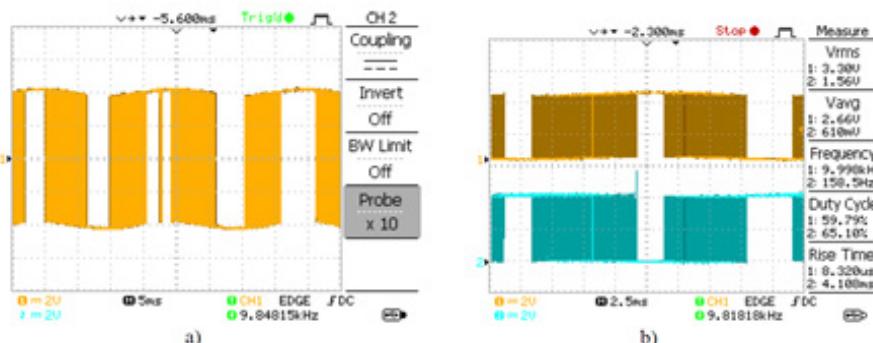
In this paper a control signals of H-bridge power converter has been described, simulated and generated. Instead of power converter its model has been used.



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*Emuliranje učinskog izmjenjivača razvojnom pločicom mikrokontrolera (Arduino Uno)  
/ Emulation of power converter with microcontroller (Arduino Uno)*



*Izmjereni valni oblici upravljačkih signala za bipolarnu PWM (eng. pulse width modulation) modulaciju a) valni oblik izlaznog napona; b) upravljački signali za jednofazni mosni izmjenjivač (2V/d.s., 5ms/d.s.)*

/ Measured waveforms of transistor control signals (PWM) for bipolar modulation a) output voltage; b) control signals (2V/div., 5ms/div.)

**IME I PREZIME | NAME AND SURNAME:**  
Ivan Sinčić

Diplomski sveučilišni studij elektrotehnike / Graduate University Study of Electrical Engineering

**NAZIV RADA | TITLE:**  
Arm mikrokontroleri i indukcijsko zagrijavanje  
Arm Microcontrollers And Induction Heating

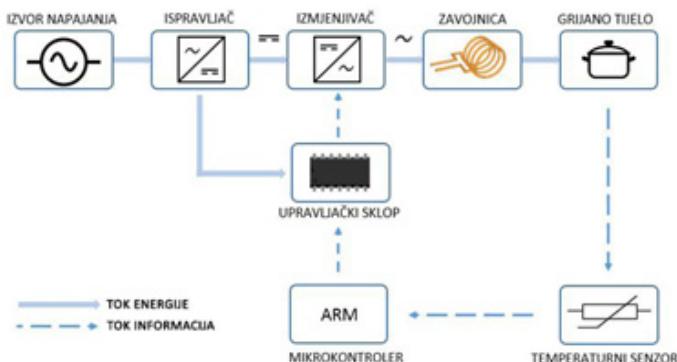
**MENTOR(I) | SUPERVISOR(S):**  
doc. dr. sc. / Assist. Prof. D. Sc. Saša Sladić

Sažetak:

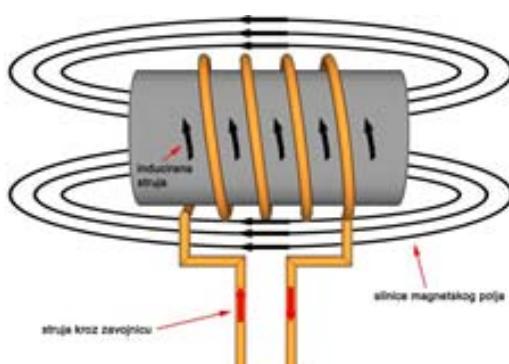
U radu je opisana fenomenologija indukcijskog zagrijavanja te su izvršeni pokusi na vlastitom prototipu i na komercijalnom sklopu.

Summary:

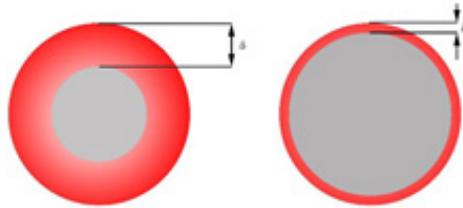
In this paper a fenomenology of induction heating has been described. Power inverter prototype has been built and compared with comercial solutions.



Blok shema sustava za indukcijsko zagrijavanje  
/ Induction heating system schematic

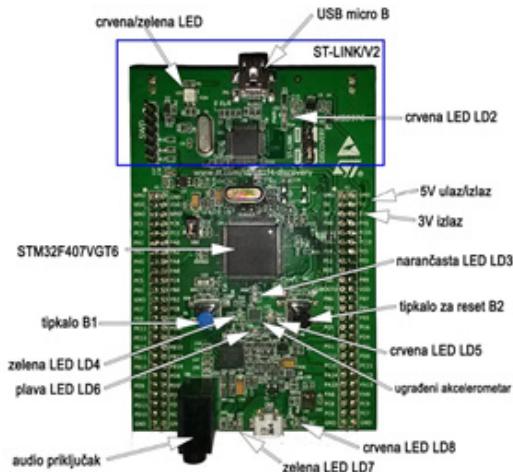


Način generiranja vrtložnih struja u vodljivom materijalu  
/ Eddy currents generation in conducting material

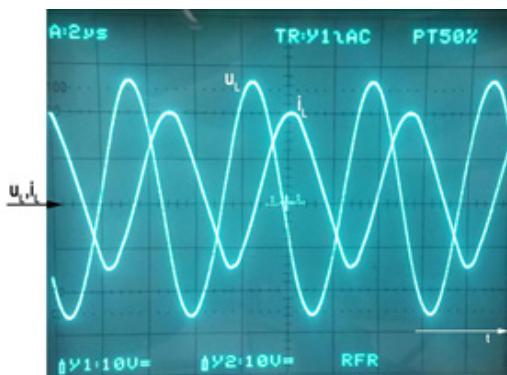


Dubina prodiranja elektromagnetskog zračenja  $\delta$  za isti materijal je manja što je frekvencija djelovanja izmjenjivača viša

/ Penetration depth of electromagnetic radiation  $\delta$  is smaller for higher frequencies



STM32F4 Discovery razvojni sustav za generiranje upravljačkih signala izmjenjivača  
/ STM32F4 Discovery board has been used for the control of power converter



Izmjereni valni oblici napona i struje trošila jednofaznog poluosnog izmjenjivača za induksijsko zagrijavanje (10V/d.s., 1A/d.s., 2μs/d.s.)

/ Measured waveforms of voltage ( $u_L$ ) and current ( $i_L$ ) for single-phase power inverter for induction heating (10V/div., 1A/div., 2μs/div.)

**IME I PREZIME | NAME AND SURNAME:**  
Domagoj Sedlar

Diplomski sveučilišni studij strojarstva / Graduate University Study of Mechanical Engineering

**NAZIV RADA | TITLE:**  
Analiza mehaničkog ponašanja gitare  
Analysis of the Mechanical Behaviour of a Guitar

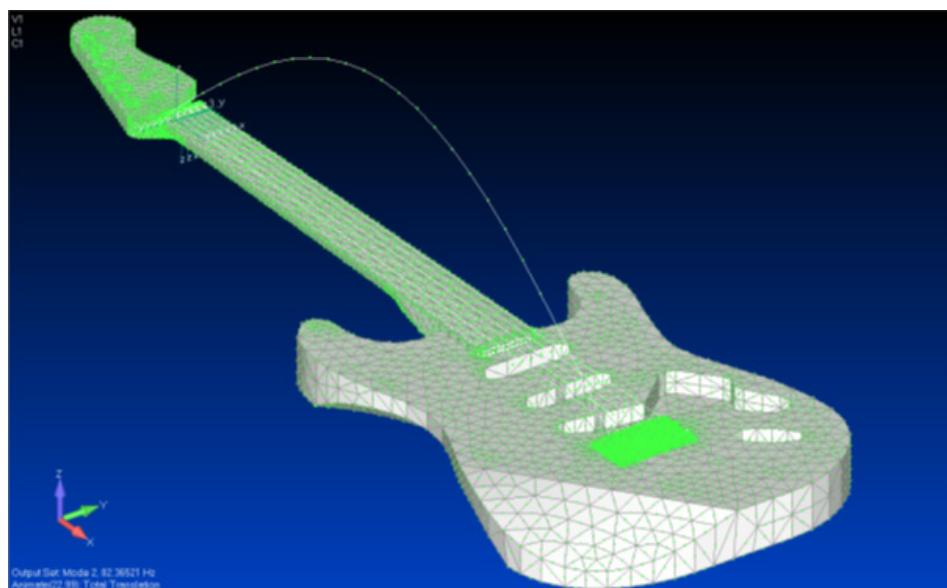
**MENTOR(I) | SUPERVISOR(S):**  
prof. dr. sc. / Prof. D. Sc. Marko Čanađija  
prof. dr. sc. / Prof. D. Sc. Roberto Žigulić

#### Sažetak:

U radu je izvršena numerička analiza mehaničkog ponašanja električne gitare Fender Squier Classic Vibe Stratocaster® '60s. Dobiveni se rezultati podudaraju s onim poznatima pri njezinoj uporabi. Posebna je pozornost posvećena analizi vlastitih vrijednosti. Kako su vlastite frekvencije u velikoj mjeri određene s krutosti sustava, pomoću metode konačnih elemenata učinjena je analiza krutosti gitare. Na konstruiranu geometriju u konačno elementnom softveru dodane su žice i naknadno je provedena analiza radi utvrđivanja frekvencija žica. Po potrebi se najprije modeliralo statičko preopterećenje žica kako bi se ostvarila naštimanost gitare. Proučavano je više slučajeva za različite titrajne duljine žica.

#### Summary:

The present work presents a numerical analysis of the mechanical behaviour of the Fender Squier Classic Vibe Stratocaster® '60s electric guitar. The obtained results are consistent with those known for its use. Particular attention was given to the analysis of natural values. Due to the fact that natural frequencies are to a great extent determined by the rigidity of the system, an analysis of the guitar rigidity was performed using the finite elements method. Strings were added to the constructed geometry in the finite element software, which was subsequently followed by an analysis with the aim of determining their frequencies. Where needed, the static preload of the strings was modelled to tune the guitar. Several cases were studied for different oscillatory lengths of strings.



**IME I PREZIME** | NAME AND SURNAME:  
Tanja Štajduhar

Diplomski sveučilišni studij računarstva / Graduate University Study of Computer Engineering

**NAZIV RADA** | TITLE:  
Automatizirana detekcija povrede stražnjeg križnog ligamenta iz MRI snimki  
Automated Detection of Posterior Cruciate Ligament Injury From MRI Data

**MENTOR(I)** | SUPERVISOR(S):  
doc. dr. sc. / Assist. Prof. D. Sc. Ivan Štajduhar

Sažetak:

Pravovremeno donesena i točna dijagnoza temelj je učinkovitog liječenja. U slučajevima u kojima je dijagnozu potrebno donijeti na temelju složenog skupa podataka, kao što je onaj producirani MRI oslikavanjem, detekcija ozljeda i drugih patologija postaje dugotrajan i zamoran proces podložan greškama. Cilj računalno potpomođene dijagnostike (eng. Computer-Aided Diagnosis - CAD) je olakšati rad specijalista radiologa i smanjiti broj pogrešnih dijagnoza djelomičnom automatizacijom tog procesa, te je kao takva postala jednom od najvažnijih tema istraživanja na polju medicinskog oslikavanja i dijagnostičke radiologije. U ovom radu ispitana je mogućnost stvaranja CAD sustava za detekciju ozljede stražnjeg križnog ligamenta koljena korištenjem metoda strojnog učenja. Razvoj i evaluacija programskog rješenja izvršeni su nad uzorkom od 743 MRI pregleda koljena, prikupljenim u Kliničkom bolničkom centru Rijeka, a pismeno dopuštenje za njegovo korištenje dobiveno je od strane etičkog povjerenstva Centra. Automatizacija detekcije ozljede izvršena je u tri faze. U prvoj fazi primjenom SVM (eng. Support Vector Machine) modela i modela linearne regresije nad HOG (eng. Histogram of Oriented Gradients) značajkama režnjeva pregleda implementirani su i evaluirani procesi detekcije režnjeva na kojima je vidljiva regija stražnjeg križnog ligamenta, te detekcije koordinata te regije. U drugoj fazi nad HOG značajkama slika regije od interesa (eng. Region of Interest – ROI) primijenjene su i evaluirane različite metode implementacije procesa detekcije ozljede, temeljene na SVM modelu. U trećoj fazi ulančani su modeli za detekciju regije od interesa i detekciju ozljede, te je izvršena evaluacija konačnog rješenja. Rezultati ukazuju na to da su generirani modeli detekcije regije od interesa pojedinačno učinkoviti u detekciji režnjeva na kojima je prikazan stražnji križni ligament, odnosno detekciji koordinata regije od interesa, no njihovim ulančavanjem gubi se

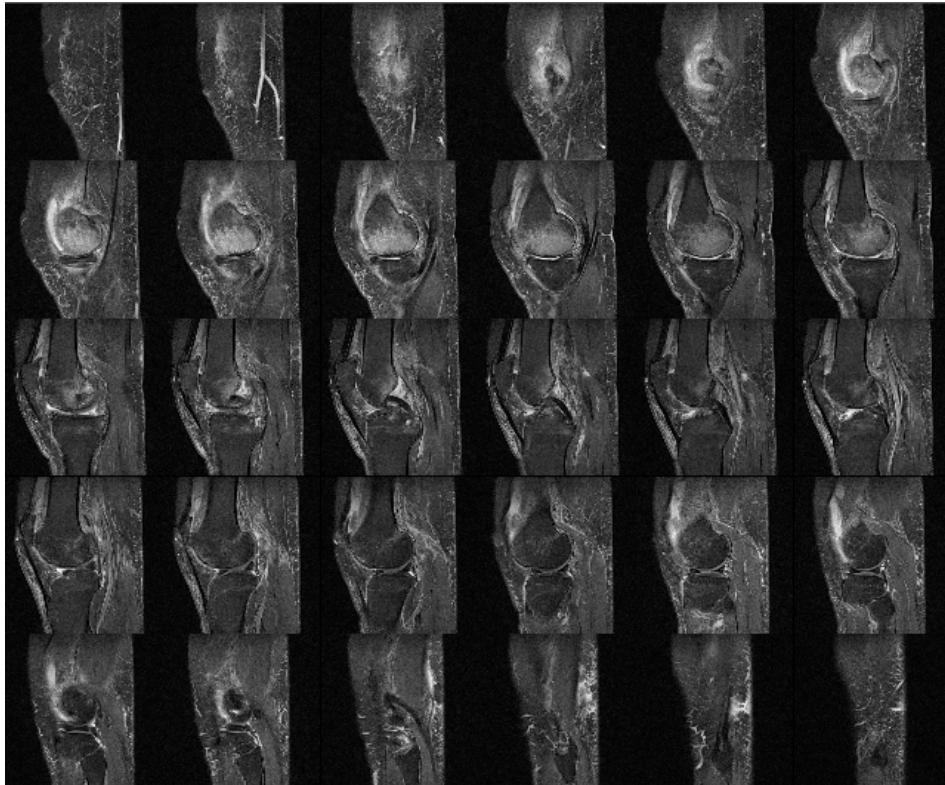
Summary:

A timely and accurate diagnosis is the foundation of effective treatment. In cases in which the diagnosis is based on a complex dataset, such as the one produced by MRI imaging, detecting injuries or other pathologies becomes a time consuming and tedious process, susceptible to errors. The goal of computer-aided diagnosis systems (CAD) is to facilitate the work of radiology specialists and reduce the number of misdiagnoses, by providing a level of automation of the aforementioned process. For this reason, CAD has become one of the most important research topics in the field of medical imaging and diagnostic radiology. This study examines the possibility of creating a CAD system for automated detection of posterior cruciate ligament injuries, using machine learning methods. The study was performed on a sample of 743 knee MRI sequences, which were collected at the Clinical Hospital Centre Rijeka, Croatia. A written permission for their use was obtained from the Centre's Ethics Committee. The automation of injury detection was performed in three stages. During stage one the ROI (Region of Interest) detection process was implemented. The detection of ROI slices was automated using SVM (Support Vector Machine) models and slice HOG (Histogram of Oriented Gradients) features; linear regression models were used in combination with slice HOG features to detect the two-dimensional ROI coordinates. In stage two the possibilities of injury detection automation were examined, using SVM models and sequence HOG features. During stage three the models were combined in order to evaluate the quality of the final solution. The findings indicate that the models generated to detect the region of interest are, by themselves, effective in detecting MRI slices that display the ligament, as well as the two-dimensional coordinates of the region of interest, but combining the two produces a decline in the quality of detection. The quality of



na kvaliteti detekcije. Proces detekcije ozljeda na slikama regije od interesa zbog premalog uzorka primjeraka ozljeda nije implementiran na zadovoljavajućoj razini kvalitete, a njegovim ušančavanjem s procesima detekcije regije od interesa kvaliteta detekcije dodatno opada.

the implemented process of injury detection is unsatisfactory. This finding is probably caused by the insufficient injury sample in the dataset. The quality of detection declines further by combining this model with the previous two.



*Primjer MRI sekvence pregleda  
/ A sample MRI sequence*

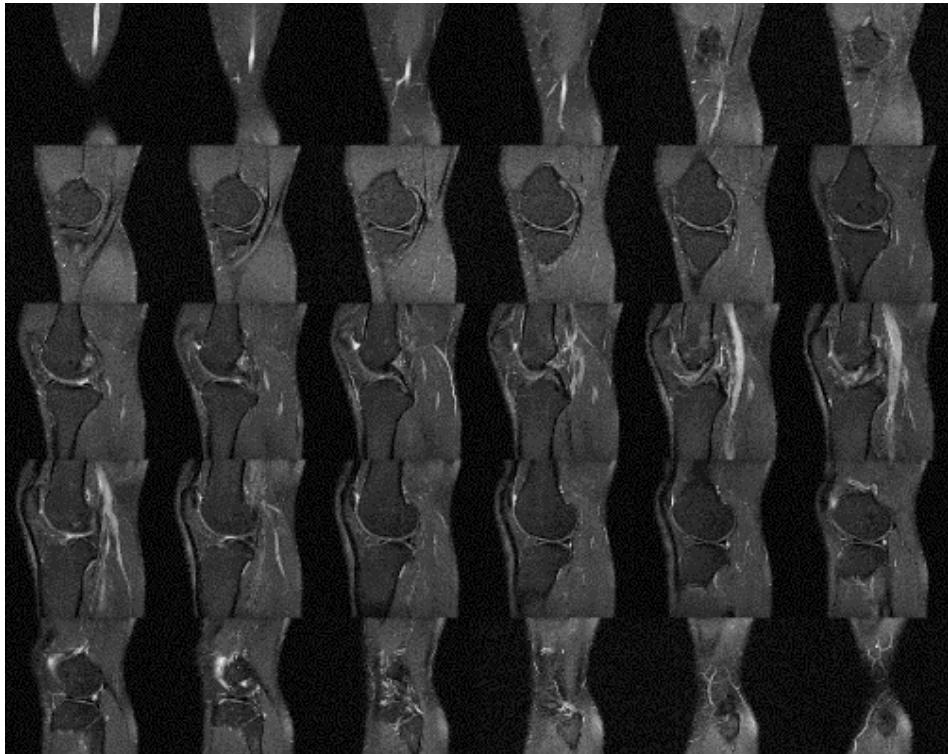


*(a)*

*MRI prikaz zdravog (a) i ozljeđenog (b) stražnjeg križnog ligamenta  
/ MRI appearance of a healthy (a) and an injured (b) posterior cruciate ligament*

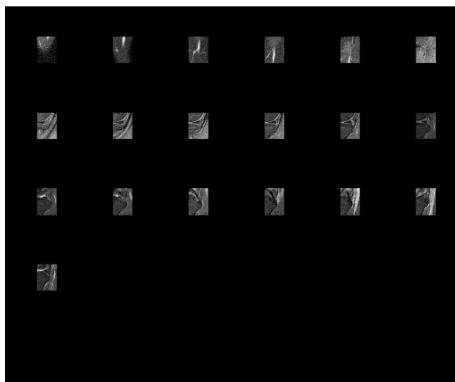


*(b)*

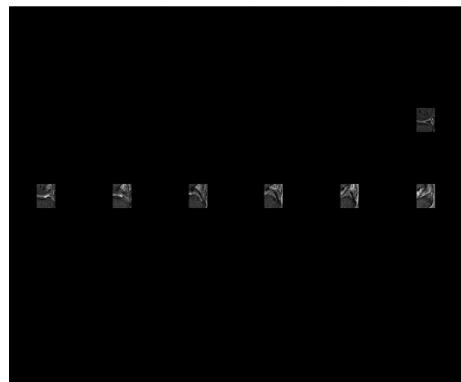


70

Originalni volumen  
/ Original volume

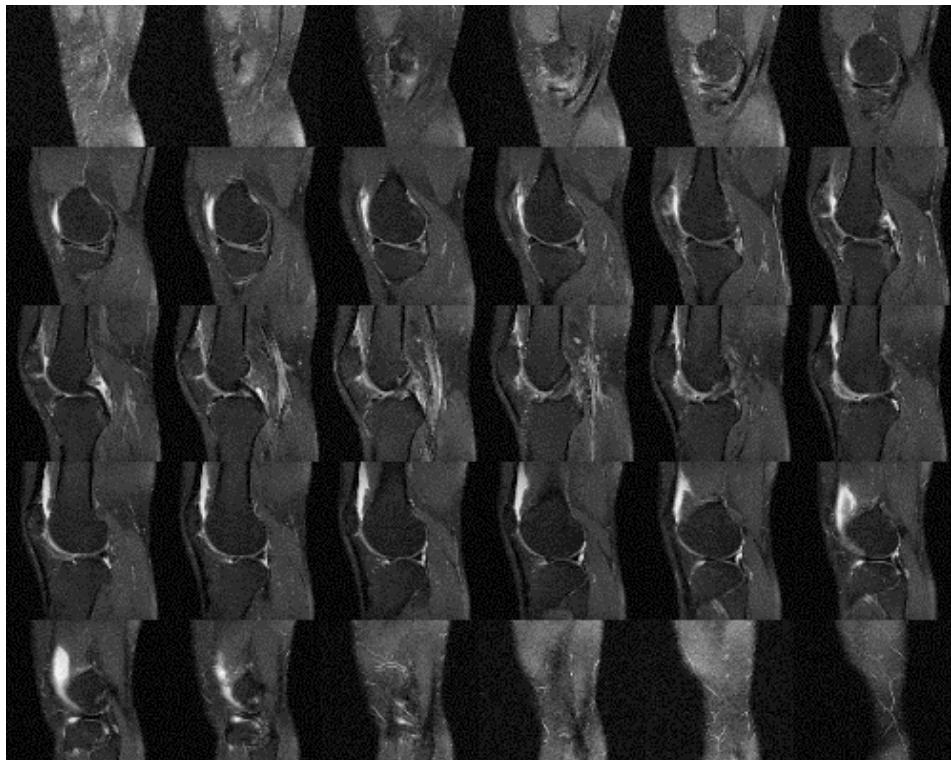


Procijenjeni ROI  
/ Predicted ROI



Stvarni ROI  
/ Real ROI

Primjer loše procijenjene regije od interesa  
/ An example of an ill-predicted region of interest



Originalni volumen  
/ Original volume



71

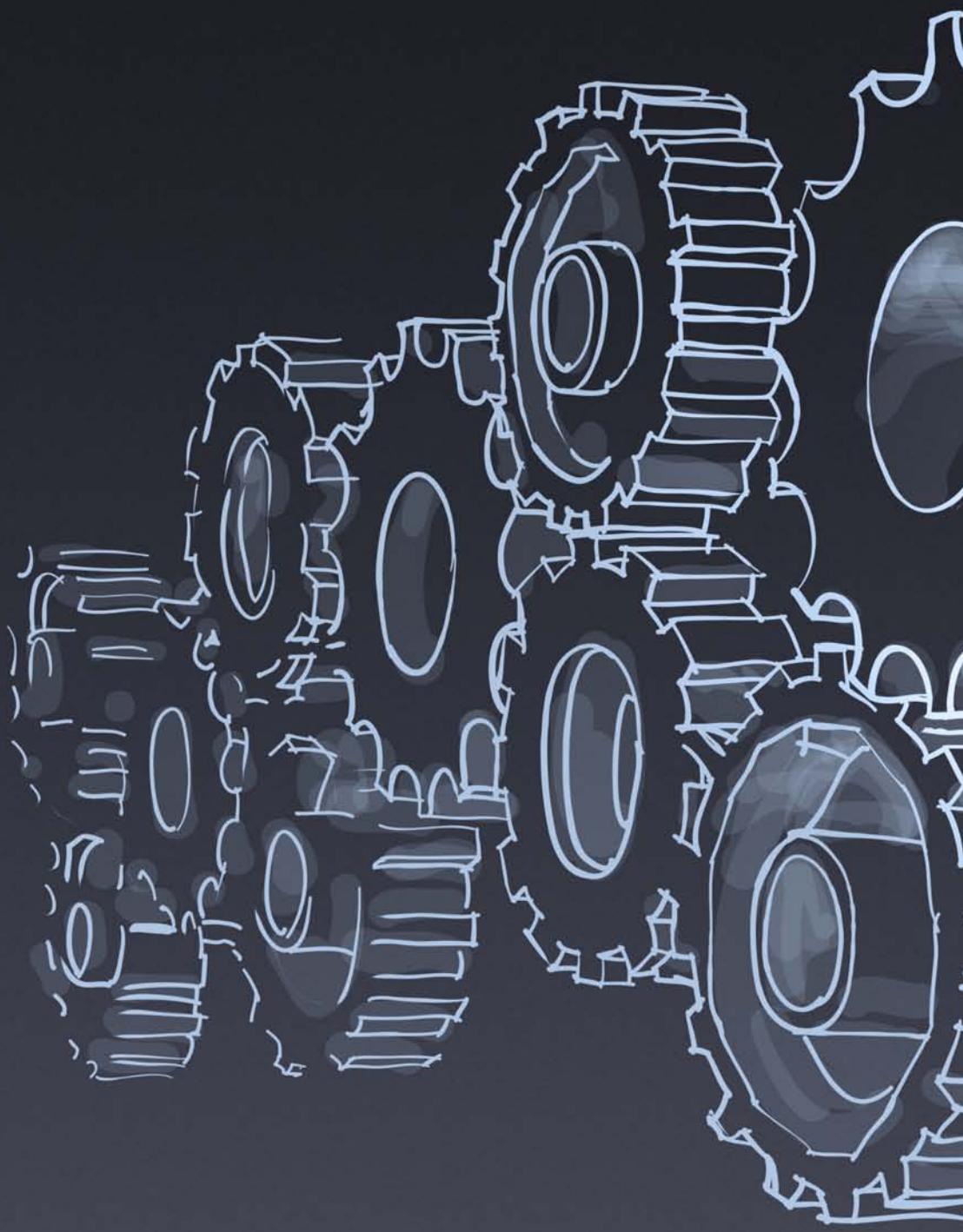


Procijenjeni ROI  
/ Predicted ROI



Stvarni ROI  
/ Real ROI

Primjer dobro procijenjene regije od interesa  
/ An example of a well-predicted region of interest





# 3 studijski programi na fakultetu

## study programs at the faculty

PREDDIPLOMSKI SVEUČILIŠNI STUDIJ 3-godišnji (180 ECTS)		UNDERGRADUATE UNIVERSITY STUDY 3 years (180 ECTS)	
Studij	Naziv	Study	Title
Strojarstvo	Sveučilišni prvostupnik inženjer strojarstva	Mechanical Engineering	University Bachelor of Mechanical Engineering
Brodogradnja	Sveučilišni prvostupnik inženjer brodogradnje	Naval Architecture	University Bachelor of Naval Architecture
Elektrotehnika	Sveučilišni prvostupnik inženjer elektrotehnike	Electrical Engineering	University Bachelor of Electrical Engineering
Računarstvo	Sveučilišni prvostupnik inženjer računarstva	Computer Engineering	University Bachelor of Computer Engineering

DIPLOMSKI SVEUČILIŠNI STUDIJ 2-godišnji (120 ECTS)		GRADUATE UNIVERSITY STUDY 2 years (120 ECTS)	
Studij	Naziv	Study	Title
Strojarstvo	Magistar inženjer strojarstva	Mechanical Engineering	Master of Mechanical Engineering
Brodogradnja	Magistar inženjer brodogradnje	Naval Architecture	Master of Naval Architecture
Elektrotehnika	Magistar inženjer elektrotehnike	Electrical Engineering	Master of Electrical Engineering
Računarstvo	Magistar inženjer računarstva	Computer Engineering	Master of Computer Engineering

POSLIJEDIPLOMSKI SVEUČILIŠNI (DOKTORSKI) STUDIJ 3-godišnji (180 ECTS)		POSTGRADUATE UNIVERSITY (DOCTORAL) STUDY 3 years (180 ECTS)	
Studij	Naziv	Study	Title
Strojarstvo		Mechanical Engineering	
Temejlne tehničke znanosti		Basic Engineering Sciences	
Brodogradnja		Naval Architecture	
Druge interdisciplinarne tehničke znanosti		Other Interdisciplinary Sciences	
Elektrotehnika		Electrical Engineering	
			D. Sc. in the area of Engineering Sciences

PREDDIPLOMSKI STRUČNI STUDIJ 3-godišnji (180 ECTS)		UNDERGRADUATE VOCATIONAL STUDY 3 years (180 ECTS)	
Studij	Naziv	Study	Title
Strojarstvo	Stručni prvostupnik inženjer strojarstva	Mechanical Engineering	Bachelor of Mechanical Engineering
Brodogradnja	Stručni prvostupnik inženjer brodogradnje	Naval Architecture	Bachelor of Naval Architecture
Elektrotehnika	Stručni prvostupnik inženjer elektrotehnike	Electrical Engineering	Bachelor of Electrical Engineering



Studiji na Tehničkom fakultetu ustrojeni su prema Bolonjskom modelu 3 + 2 + 3, što znači da se obrazovanje provodi kroz preddiplomski sveučilišni studij u trajanju od tri godine kojim se stječe 180 ECTS bodova, zatim diplomski sveučilišni studij u trajanju od dvije godine kojim se stječe 120 ECTS bodova te poslijediplomski sveučilišni (doktorski) studij u trajanju od tri godine kojim se stječe 180 ECTS bodova.

Osim tih studija, obrazovanje se provodi i kroz preddiplomske stručne studije u trajanju od tri godine kojima se stječe također 180 ECTS bodova. Taj je sustav s vrstama pojedinih studija i stečenim nazivima prikazan u tablici. U nastavku su opisane osnovne značajke pojedinog studija.

### **PREDDIPLOMSKI SVEUČILIŠNI STUDIJ STROJARSTVA**

Preddiplomski sveučilišni studij strojarstva priprema studente za diplomski sveučilišni studij strojarstva, ali im pruža i mogućnost zapošljavanja na odgovarajućim stručnim poslovima. Studij ima za cilj osposobljavanje studenata za primjenu temeljnih i specijalističkih znanja iz strojarstva, prepoznavanje, oblikovanje i rješavanje problema iz prakse, primjenu drugih stečenih znanja iz tehnike, matematike i računarstva, korištenje suvremenih inženjerskih alata, razumijevanje timskog rada i učinkovite komunikacije, razumijevanje etičnosti i etičke odgovornosti i razumijevanje utjecaja inženjerskih rješenja na društvo i okolinu. Student koji završi ovaj studij sposoban je uključiti se u kontinuirano obrazovanje i profesionalni razvoj te posjeduje šire obrazovanje.

Studies at the Faculty of Engineering are set according to the Bologna model 3 + 2 + 3, which means that education continues through a three year long undergraduate university study resulting in 180 ECTS credits obtained, followed by a two year graduate university study resulting in 120 ECTS credits obtained and a postgraduate university (doctoral) study which lasts three years and results in 180 ECTS credits obtained.

Apart from these studies, education is accomplished through a three year undergraduate vocational study that results in 180 ECTS credits. The curricula with the respective types of studies and obtained titles are shown in the following table. The basic characteristics of each study are described below.

### **UNDERGRADUATE UNIVERSITY STUDY OF MECHANICAL ENGINEERING**

The undergraduate university study of mechanical engineering prepares the students for graduate university study and provides an opportunity for placement in appropriate professional employment. The aim of the study is to prepare the students for implementing basic and specialististic knowledge in the field of mechanical engineering, recognizing, defining and solving practical problems, implementing other acquired engineering knowledge, math and computing, using modern engineering tools, understanding teamwork and efficient communication, understanding ethics and responsibility and the influence of engineering solutions on society and the environment. At the end of study, students are able to continue with education and professional development and possess a broader education.



## Prediplomski sveučilišni studiji

S Študijsko sveučilišno studij		S Brodogradnja		S Elektrotehnika		S Računarstvo	
S Predmet	B Predmet	N	B	N	B	N	B
I Matematika I	6 7	I Matematika I	6 7	I Matematika I	6 7	I Matematika I	6 7
Statika	5 6	Statika	5 6	Fizika I	4 5	Uvod u modernu fiziku	3 4
Materialji I	4 4	Materialji I	4 4	Osnove elektrotehnike I	6 7	Elektrotehnika R	4 7
Elektrotehnika	3 5	Elektrotehnika	3 5	Uvod u računarstvo	4 6	Programiranje I	4 6
Računalne aplikacije u inženjerstvu	3 4	Računalne aplikacije u inženjersvju	3 4	Inženjerska grafička dokumentiranje	4 5	Računalne vještine	2 3
Inženjerska grafička	4 4	Inženjerska grafička	4 4	Inženjerski jezik I	3 3	Inženjerski jezik I	3 3
II Matematika II	6 7	II Matematika II	6 7	II Matematika II	6 7	II Matematika II	6 7
Kinematika	5 6	Kinematika	5 6	Fizika II	4 5	Elektronika	4 7
Čvrstočka konstrukcija I	6 7	Čvrstočka konstrukcija	6 7	Osnove elektrotehnike II	6 7	Programiranje II	5 7
Materialji II	3 5	Materialji II	3 5	Programiranje	4 6	Digitalna logika	4 6
Obljekovanje pomoću računala	4 5	Obljekovanje pomoću računala	4 5	Inženjerska matematička ET	3 5	Inženjerski jezik II	3 3
III Dinamika	4 5	III Dinamika	4 5	Mjerenja u elektrotehnici	5 7	Inženjerska matematika R	4 5
Mehanika fluida	5 5	Mehanika fluida	5 5	Mjerenja u elektrotehnici	5 7	Algoritmi i strukture podataka	5 7
Nauka o topini I	6 7	Zavarivanje I	3 4	Elektronika I	4 6	Gradač računala	4 6
Mjerenja i kontrola kvalitete	3 5	Termodynamika I	4 5	Električne mreže	4 7	Signali i sustavi	4 6
Računalne metode	4 5	Uvod u plavne objekte	3 4	Strani jezik I	2 3	Uvod u objektno orij. programiranje	4 6
Strani jezik I	2 3	Osnove konstrukcijskih elemenata	4 4				
IV Inženjerska statistika	4 5	IV Inženjerska statistika	4 5	IV Digitalna logika	4 6	Operacijski sustavi	4 7
Konstruktivski elementi I	5 7	Brodske forme	5 6	Elektronika II	4 6	Računalne mreže	4 7
Hidraulički strojevi	4 5	Osnove gradnje broda	3 5	Osnove regulačijske tehnike	4 6	Računalna grafika	4 7
Proizvodne tehnologije	4 5	Konstrukcija broda I	4 6	Izborni kolegij	4 4	Izborni kolegij I	3 4
Strani jezik II	2 3	Engleski jezik II	2 3	Strani jezik II	2 3	Stručna praksa I	5 5
Stručna praksa I	5	Stručna praksa I	5	Stručna praksa I	5	Ugradbeni računalni sustavi	5 7
V Konstruktivski elementi II	6 7	V Plavnost i stabilitet broda	6 7	V Električni strojevi	5 6	Baze podataka	4 6
Toplinski strojevi i uređaji	4 5	Oprema broda	4 6	V Energetska elektronika	4 6	Razvoj web aplikacija	4 7
Proizvodni strojevi, alati i naprave	4 5	Konstrukcija broda II	4 6	Signalni i sustavi	4 7	Izborni kolegij II	4 5
Kolegij izborne skupine	4 4	Tehnologija brodogradnje	4 4	Kolegij izborne skupine	4 5	Izborni projekt	3 5
Tehnološki procesi	4 4	Izborni projekt	3 5	Izborni projekt	3 5	Izborni projekt	3 5
VI Energetski sustavi	4 4	VI Organizacija i ekonomika posl. sust.	3 4	VI Elektromotorni pogoni	4 5	Programsko inženjerstvo	5 7
Automatizacija	3 4	Hidrodinamika plavnih objekata I	6 8	Organizacija i ekonomika posl. sust.	3 4	Organizacija i ekonomika posl. sust.	3 4
Kolegij izborne skupine	4 4	Kolegij izborne skupine	3 4	Kolegij izborne skupine	5 7	Osnove inanstvenog računanja	4 5
Organizacija i ekonomika posl. sust.	3 4	Slobodni kolegij II	3 4	Slobodni kolegij II	3 4	Slobodni kolegij	3 4
Slobodni kolegij	3 4	Završni rad	10	Završni rad	10	Završni rad	10
Završni rad	10						

(Studijski programi pojedinih studija prikazani su na gornjoj i na tablicama koje slijede: sa S je označen semestar u kojem se predmet predaje, s N su označeni sati nastave tijedno, a s B broj ECTS bodova pripadnog predmeta.)

Undergraduate University Studies		S Naval Architecture Course		S Electrical Engineering Course		S Computer Engineering Course	
S Mechanical Engineering Course		N B	N B	N B	N B	N B	N B
I Mathematics I	6 7	1	Mathematics I	6 7	1	Mathematics I	6 7
Statics	5 6		Statics	5 6		Physics I	4 5
Materials I	4 4		Materials I	4 4		Fundamentals of Electrical Engineering I	6 7
Electrical Engineering	3 5		Electrical Engineering	3 5		Introduction to Computer Engineering	4 6
Computer Applications in Engineering	3 4		Computer Applications in Engineering	3 4		Engineering Graphics and Documenting	4 5
Engineering Graphics	4 4		Engineering Graphics	4 4		Computer Skills	2 3
II Mathematics II	6 7	II	Mathematics II	6 7	II	Mathematics II	6 7
Kinematics	5 6		Kinematics	5 6		Physics II	4 5
Strength of Materials I	6 7		Strength of Materials	6 7		Fundamentals of Electrical Engineering II	6 7
Materials II	3 5		Materials II	3 5		Programming	4 6
Modelling by Computer	4 5		Modelling by Computer	4 5		Materials Technology	3 5
III Dynamics	4 5	III	Dynamics	4 5	III	Mathematics for Engineers EE	5 7
Fluid Mechanics	5 5		Fluid Mechanics	5 5		Algorithms and Data Structures	5 7
Thermodynamics I	6 7		Welding Engineering I	3 4		Algorithms	4 6
Wear, Durability and Quality Control	3 5		Thermodynamics NA	4 5		Computer Architecture	4 7
Computational Methods	4 5		Introduction to Marine Vessels	3 4		Computer Circuits	4 7
Foreign Language I	2 3		Basis of Machine Elements Design	4 4		Signals and Systems	4 6
IV Engineering Statistics	4 5	IV	English Language I	2 3		Introduction to Object Oriented Programming	4 6
Machine Elements Design I	5 7		Engineering Statistics	4 5	IV	Operating Systems	4 5
Hydraulic Machines	4 5		Ship Hull Forms	5 6	V	Operating Systems	4 7
Production Technologies	4 5		Basics of Ship Production	3 5		Computer Networks	4 6
Foreign Language II	2 3		Ship Structure I	4 6		Computer Graphics	4 7
Professional practice I	5 5		English Language II	2 3		Elective course I	3 4
V Machine Elements Design II	6 7	V	Professional Practice I	5 5		Professional practice I	5 5
Heat Engines and Devices	4 5		Seaworthiness and Stability of the Ship	6 7	V	Professional practice II	5 6
Production Machines, Tools, Jigs and Fixtures	4 5		Ship Equipment	4 6		Embedded Systems	5 7
Elective Group course	4 4		Ship Structure II	4 6		Database Systems	4 6
Technological Processes	4 4		Shipbuilding Technology	4 6		Web Application Development	4 7
Elective Project	3 5		Elective project	3 5		Elective course II	4 5
VI Energy Systems	4 4	VI	Organization and Economics of Business System	3 4	VI	Elective group course	3 5
Automation	3 4		Marine Hydrodynamics I	6 8		Elective project	3 5
Elective Group course	4 4		Free course I	3 4		Software Engineering	5 7
Organization and Economics of Business System	3 4		Free course II	3 4		Organization and Economics of Business System	3 4
Free course	3 4		Final Work	10		Scientific Computing Fundamentals	4 5
Final work	10					Free course	3 4
						Final work	10

(Curricula of the described studies are presented above and in the tables below: S signifies the semester in which the course is placed, with N lecturing hours per week, and B the number representing ECTS credits.)



## PREDDIPLOMSKI SVEUČILIŠNI STUDIJ BRODOGRADNJE

Preddiplomski sveučilišni studij brodogradnje priprema studente za diplomske sveučilišne studije brodogradnje, ali im pruža i mogućnost zapošljavanja na odgovarajućim stručnim poslovima. Na preddiplomskom studiju brodogradnje polaznicima se u razumnoj količini i na dovoljno visokoj razini daje znanje iz temeljnih tehničkih sadržaja s jedne strane, te iz glavnih brodograđevnih sadržaja s druge strane, kako bi u svojoj radnoj praksi, kao i u svojem dalnjem stručnom i znanstvenom usavršavanju, uvijek bili na razini postavljenih zadataka. Svojim opsegom i sadržajem ovaj studij polazniku daje potrebnu širinu stručnih znanja koja ga po završetku studija sposobjava za samostalan rad, odnosno za rad u stručnim timovima u bilo kojem segmentu brodograđevne struke. Završeni student ovog studija sposoban je uključiti se u kontinuirano obrazovanje i profesionalni razvoj te posjeduje i šire obrazovanje.

## PREDDIPLOMSKI SVEUČILIŠNI STUDIJ ELEKTROTEHNIKE

Završetkom preddiplomskoga sveučilišnog studija elektrotehnike polaznik posjeduje temeljna znanja iz matematike, fizike, elektrotehnike i primjene računala. Nadalje, zna pripremiti i izvesti eksperiment, odnosno određena mjerena te ih pravilno obraditi i protumačiti rezultate. Sposoban je identificirati, formulirati i rješiti problem. Pri tome se zna koristiti suvremenim inženjerskim alatima i spremam je za rješavanje šireg spektra inženjerskih zadataka uz mogućnost brze specijalizacije u određenom području. Polaznik je također sposoban raditi u (multidisciplinarnoj) grupi, razumije važnost učinkovite komunikacije u rješavanju određenoga inženjerskog problema, a u svojem radu poštije profesionalne i etičke norme te zaštitu okoliša. Nakon završetka studija sposoban je uključiti se u kontinuirano obrazovanje i profesionalni razvoj te posjeduje šire obrazovanje.

## UNDERGRADUATE UNIVERSITY STUDY OF NAVAL ARCHITECTURE

The undergraduate university study of naval architecture prepares the students for graduate university study and gives them the opportunity for employment in appropriate professional employment positions. The undergraduate study of naval architecture, offers students on the one hand a reasonable quantity and quality of knowledge in basic engineering and, on the other hand, knowledge about the main constructions of shipbuilding so that they can be prepared for professional jobs as well as for further professional education. With its volume and contents, this study gives an adequate width of knowledge so that students can work either in teams or as individuals in any field of the shipbuilding process. At the end of study, students are able to continue with education and professional development and possess broader education.

## UNDERGRADUATE UNIVERSITY STUDY OF ELECTRICAL ENGINEERING

Upon completion of the undergraduate university study of electrical engineering, the student obtains a basic knowledge of math, physics, basic electrical engineering and applied computer engineering. Furthermore, he knows how to prepare and conduct experiments and appropriate measurement and correctly process and recognize the obtained results. He is capable of identifying, formulating and solving problems. In such a way, he is able to use modern engineering tools and is prepared for solving a wide spectrum of engineering tasks related to the ability of fast specialization in certain fields. He is able to work in teams, he understands the importance of efficient communication in solving particular engineering problems and he acts in accordance with professional and ethical codes, as well as environmental protection standards. At the end of the study, students are able to continue with their education and professional development and they possess broader education.



## PREDDIPLOMSKI SVEUČILIŠNI STUDIJ RAČUNARSTVA

Ovaj preddiplomski sveučilišni studij ima za cilj pružiti razinu znanja koje će osigurati profil stručnjaka sposobljenih za samostalno obavljanje poslova sastavljanja, održavanja i posluživanja računalnih sustava kao i njihova korištenja kao alata. Ova znanja obuhvaćaju područja računalne programske i sklopovske opreme te znanja iz područja računalnih mreža i sustava. Time se osigurava razina izobrazbe nužna za svladavanje niza stručnih poslova. Pri tome je polaznik sposoban raditi u (multidisciplinarnoj) skupini, razumije važnost učinkovite komunikacije na rješavanju određenoga inženjerskog problema, a u svojem radu poštuje profesionalne i etičke norme te zaštitu okoliša. Završeni polaznik ovog studija sposoban je uključiti se u kontinuirano obrazovanje i profesionalni razvoj te posjeduje šire obrazovanje.

## DIPLOMSKI SVEUČILIŠNI STUDIJ STROJARSTVA

Na ovom studiju omogućena je specijalizacija u jednome od sljedećih područja:

- Konstruiranje i mehatronika
- Računarska mehanika i inženjerstvo
- Tehnološko-informatičko inženjerstvo
- Industrijsko inženjerstvo i management
- Termotehnika
- Procesno i energetsko strojarstvo
- Brodostrojarstvo
- Inženjerstvo materijala

Diplomskim sveučilišnim studijem strojarstva studenti stječu potrebna uskospesijalistička znanja iz navedenih područja čime su sposobljeni za obavljanje najsloženijih inženjerskih zadaća temeljenih na znanstvenom pristupu rješavanju problema. Stječu se nova specijalistička znanja iz strojarstva i sposobnost njihove primjene, kao i poznavanje i primjena drugih specijalističkih znanja iz tehnike, matematike i računarstva. Studenti razvijaju sposobnost kontinuiranog obrazovanja i samoobrazovanja, sposobnost samostalnog istraživanja, otkrivanja novih znanja, pripreme i izvođenja eksperimentirana te tumačenja podataka. Studijem se stječu znanja i kompetencije potrebne za projektiranje novih sustava, komponenata ili procesa te učinkovito djelovanje u ulozi vođe tima. Studijski program sličan je programima studija na inozemnim visokim učilištima uz postizanje specifičnih zahtjeva sredine za koju se prvenstveno školjuju

## UNDERGRADUATE UNIVERSITY STUDY OF COMPUTER ENGINEERING

This study program aims at providing a level of knowledge that will yield a profile of experts trained to independently perform tasks of assembling, serving and maintaining computer systems and using the same as tools. This category includes knowledge of computer software and hardware as well as knowledge in the field of computer networks and systems, ensuring the level of training required to master a number of related jobs. The student is also able to work in a group and he understands the importance of effective communication when solving specific engineering problems. His work respects professional and ethical standards and environmental protection. Upon completion of the study program, the student will be able to engage in lifelong learning and professional development and will have acquired broad education.

## GRADUATE UNIVERSITY STUDY OF MECHANICAL ENGINEERING

In this study, specialization is enabled in one of the following fields:

- Mechanical design and mechatronics
- Computer engineering and mechanics
- Technological information engineering
- Industrial engineering and management
- Thermal Energy Engineering
- Process and energy engineering
- Marine engineering
- Engineering of materials

This study enables students to obtain the necessary specialist knowledge in the mentioned fields and to perform the most complex engineering tasks based on a scientific problem solving approach. Students acquire new specialised knowledge of mechanical engineering and the ability to implement it as well as that of other topics in engineering, maths and computing. Students are able to continue their education and self-education, to autonomously perform research and experimental work, as well as to validate the obtained results. The study extends the knowledge and competencies necessary for designing new systems, components or processes and the efficient management of projects as team leaders. The curriculum is similar to other programs at foreign universities with some specificities tuned to the needs of the surroundings that most of the students will work in.

In the study program, recommendations of the Bologna system are implemented, especially



kadrovi na Tehničkom fakultetu Sveučilišta u Rijeci.

U studijski program uvedene su preporuke iz Bolonjske deklaracije koje se odnose na način osiguranja kvalitete studijskog programa te mobilnost pri studiranju i priznavanju diploma. Za upis na diplomski sveučilišni studij strojarstva, kako bi se omogućila horizontalna mobilnost studenata, upis je omogućen i studentima koji su završili istovrsne preddiplomske sveučilišne studije (brodogradnja, elektrotehnika, računarstvo). Na diplomskom sveučilišnom studiju strojarstva sve je veći broj studenata koji su završili preddiplomske stručne studije iz područja tehničkih znanosti te odgovarajući program razlikovne edukacije.

#### DIPLOMSKI SVEUČILIŠNI STUDIJ BRODOGRADNJE

Na diplomskom sveučilišnom studiju brodogradnje osposobljavaju se budući stručnjaci koji će raditi na poslovima i zadacima projektiranja i konstruiranja različitih vrsta i tipova plovnih objekata te razvoja i vođenja tehnoloških procesa, poglavito gradnje i održavanja plovnih objekata i objekata morske tehnologije, na poslovima klasifikacijskih i nadzornih institucija i drugim poslovima u širem području brodogradnje i inženjerstva morske tehnologije, odnosno pomorstva. Na ovom studiju moguće je odabrati sljedeće izborne skupine:

- Projektiranje i konstrukcija plovnih objekata
- Tehnologija i organizacija brodogradnje

Studijski je program usklađen s preporukama u Bolonjskoj deklaraciji koje se odnose na način osiguranja kvalitete studijskog programa te mobilnost pri studiranju i priznavanju diploma.

#### DIPLOMSKI SVEUČILIŠNI STUDIJ ELEKTROTEHNIKE

Na ovom studiju omogućena je specijalizacija u jednom od sljedećih područja:

- Automatika
- Elektroenergetika

Studenti stječu potrebna specijalistička znanja iz navedenih područja čime su osposobljeni za obavljanje stručnih, ali i znanstvenih poslova iz domene elektrotehnike. Student po završetku studija mora znati u potpunosti voditi samostalno istraživanje. Njegovi radni zadaci uključuju ne samo rješavanje problema na postojećim sustavima, nego i projektiranje novih sustava, komponenata procesa uz postavljene uvjete. Pri

concerning quality assurance, mobility during the study, as well as diploma recognition. For admission to graduate university study of mechanical engineering and in order to ensure horizontal mobility of students, enrollment is allowed to students who have completed equivalent undergraduate university studies (naval architecture, electrical engineering, computer engineering). At graduate study the number of students who have completed professional courses in engineering and an appropriate program of supplementary education is also getting larger.

#### GRADUATE UNIVERSITY STUDY OF NAVAL ARCHITECTURE

In this study, professional qualifications are acquired for tasks pertaining to the design and construction of various types of vessels, the development and leading of technological processes (mainly in shipbuilding and servicing of vessels and other objects of maritime technology), qualifications pertaining to jobs in classification and supervising institutions, as well as other jobs in the wide field of naval architecture and maritime engineering. In this study, it is possible to choose the following elective groups:

- Design and construction of vessels
- Technology and organization of ship building

The study program has been adjusted to recommendations of the Bologna system, especially concerning quality assurance, mobility during the study as well as diploma recognition.

#### GRADUATE UNIVERSITY STUDY OF ELECTRICAL ENGINEERING

In this study, specialization in one of the following fields is made possible:

- Automatics
- Power engineering

Students acquire the necessary specialististic knowledge in the fields mentioned above so that they are enabled to perform the most complex professional engineering tasks as well as those based on a scientific approach to problem solving in the area of electrical engineering. Students should be able to perform autonomous research. The student's tasks include not only problem solving of existing systems, but also the design of new systems, components and processes based on given specifications. Therefore, he is capable of working as a team or research group member or leader. The study



tome mora biti sposoban djelovati i kao vođa i kao član skupine ili istraživačkog tima. Studijski je program usklađen s preporukama u Bolonjskoj deklaraciji koje se odnose na način osiguranja kvalitete studijskog programa, mobilnost pri studiranju i priznavanju diploma.

#### DIPLOMSKI SVEUČILIŠNI STUDIJ RAČUNARSTVA

Diplomskim sveučilišnim studijem računarstva studenti stječu potrebna uskospesijalistička znanja iz jednog od navedenih područja:

- Programsко inženjerstvo
- Računalni sustavi

Time su osposobljeni za obavljanje najsloženijih zadataka temeljenih na znanstvenom pristupu rješavanju problema. Studenti usvajaju sposobnost interdisciplinarnog pristupa integraciji sustava, obrade informacija i traženja inovativnih rješenja. Samostalno će projektirati, upravljati, analizirati problem i predlagati rješenja vezana uz razvoj sklopovske i programske podrške i umrežavanja sustava. Znat će učinkovito birati i primjenjivati odgovarajuće suvremene alate i metode iz struke na kompleksne inženjerske aktivnosti. Steći će znanja i vještine za projektiranje sustava, komponenata i procesa koji odgovaraju specifičnim potrebama određenih područja.

program has been adjusted to recommendations of the Bologna system, especially concerning quality assurance, mobility during the study as well as diploma recognition.

#### GRADUATE UNIVERSITY STUDY OF COMPUTER ENGINEERING

By completing the university graduate programme in computer engineering, students attain the necessary narrowly specialised knowledge in one of the following areas:

- Software engineering
- Computer systems

Students are trained to perform the most complex engineering tasks based on the scientific approach to problem solving. They attain the skills needed for information processing, seeking innovative solutions and performing interdisciplinary approach to systems integration. Students will be able to independently plan, manage, analyse problems and propose solutions related to the development of hardware and software. They will learn how to efficiently select and apply modern tools and procedures from this field on complex engineering activities. They will acquire knowledge and skills for designing systems, components and processes that meet the specific needs of certain domains.



Diplomski sveučilišni studiji		S Strojarstvo		S Brodogradnja		S Elektrotehnika		S Računarstvo	
S	Predmet	N	B	N	B	Predmet	N	B	Predmet
I	Inženjerska matematika	5	7	1	inženjerska matematika	5	6	1	Stohastička i stohastička matematika
	Čvrstoča konstrukcije I	5	7		Čvrstoča broda	4	5		Upravljanje elektromotornim pogonima
	Nauka o opilini II	5	7		Brodske elektrotehnika	3	4		Kolegiji izborne skupine
	Kolegiji izborne skupine	4	5		Metodologija građne plovnih objekata	4	5		Kolegiji izborne skupine
	Kolegiji izborne skupine	4	4		Računarske metode i brodogradnji	4	4		Kolegiji izborne skupine
II	Projekt I	2	5	II	Kolegiji izborne skupine	5	6		
	Slobodni kolegiji I	4	5	II	Brodski sustavi	4	5	II	Upravljanje i programskom inženjerstvom
	Stručna praksa II	5		II	Projekt I	2	5	II	
	Izborni kolegiji I	4	5	II	Slobodni kolegiji I	2	5	II	
	Kolegiji izborne skupine	4	5	II	Stručna praksa II	4	5	II	
III	Slobodni kolegiji I	2	5	II	Izborni kolegiji I	5		III	
	Projekt II	4	5	II	Kolegiji izborne skupine	4	5	III	
	Izborni kolegiji II	2	5	II	Kolegiji izborne skupine	4	5	III	
	Kolegiji izborne skupine	4	5	II	Osnivanje plovnih objekata I	4	5	III	
	Kolegiji izborne skupine	4	5	II	Projekt II	2	5	III	
	Slobodni kolegiji II	2	5	II	Slobodni kolegiji II	4	5	III	
	Projekt III	4	5	II	Izborni kolegiji II	5		III	
	Izborni kolegiji II	4	5	II	Slobodni kolegiji II	4	5	III	
	Kolegiji izborne skupine	4	5	II	Diplomski rad	10		III	
	Kolegiji izborne skupine	4	5	II	Diplomski rad	10		III	
	Kolegiji izborne skupine	4	5	II	Diplomski rad	10		III	
IV	Slobodni kolegiji III	4	5	IV	Diplomski rad	10		III	
	Kolegiji izborne skupine	4	5	IV	Diplomski rad	10		III	
	Kolegiji izborne skupine	4	5	IV	Diplomski rad	10		III	
	Kolegiji izborne skupine	3	5	IV	Diplomski rad	10		III	
	Diplomski rad	10			Diplomski rad	10			
	Moduli Konstruiranje i mehatronika				Moduli Automatika				Moduli Programsko inženjerstvo
	Računarska mehanika i inženjerstvo				Elektroenergetika				Računalni sustavi
	Tehnološko informacijsko inženjerstvo								
	Industrijsko inženjerstvo i menadžment								
	Termotehnika								
	Procesno i energetsko strojopravstvo								
	Brodostrojopravstvo								
	Inženjerstvo materijala								

Graduate University Studies		S		Naval Architecture		S		Electrical Engineering		S		Computer Engineering	
S	Graduate Engineering Course	N	B	Course	N	B	Course	N	B	Course	N	B	Course
I	Mathematics for Engineers	5	7	I Mathematics for Engineers	5	6	I Numerical and Stochastic Mathematics	4	6	I Stochastic Mathematics	4	6	
	Strength of Materials II	5	7	Ship Strength	4	5	Control of Electrical Drives	4	6	Information Theory and Coding	4	6	Elective Course I/W
	Thermodynamics II	5	7	Maine Electrical Engineering	3	4	Elective group course	4	6				Elective group course
	Elective group course	4	5	Methodology of Ship Production	4	5	Elective group course	4	6				Elective group course
	Elective group course	4	4	Computational Methods in Naval Architecture	4	4	Elective group course	4	6				Elective group course
				Elective group course	5	6	Project I	2	5	II Software Engineering Management	6	7	
II	Project I	2	5	II Ship Systems	4	5	II Project I	2	5	II Free Elective Course I	4	5	Project I
	Free Elective Course I	4	5	Project I	2	5	Free Elective Course I	4	5	Professional practice II	5	5	Professional practice II
	Professional Practice II	5	5	Free Elective Course I	4	5	Professional practice II	5	5	Elective Courses	4	6	Elective Courses
	Elective Course I	4	5	Professional practice II	4	5	Elective group course	4	5	Elective group course	4	5	Elective group course
	Elective group course	4	5	Elective Course I	4	5	Elective group course	4	5	Elective group course	4	5	Elective group course
	Elective group course	4	5	Elective group course	4	5	Elective group course	4	5	III Advanced Operating Systems	6	8	Advanced Operating Systems
III	Project II	2	5	III Ship Design I	4	5	III Project II	2	5	II Free Elective Course II	4	5	Project II
	Free Elective Course II	4	5	Project II	2	5	Free Elective Course II	4	5	Free Elective Course I	3	5	Free Elective Course I
	Elective group course	4	5	Free Elective Course II	4	5	Elective Course I	4	5	Graduate Work	10	10	Elective Course I/W
	Elective group course	4	5	Free Elective Course II	4	5	Elective Course II	4	6	Elective group course	4	5	Elective group course
	Elective group course	4	5	Elective group course	4	5	Elective group course	4	5	Elective group course	3	4	Elective group course
IV	Free Elective Course II	4	5	Free Elective Course III	4	5	IV Free Elective Course III	4	5	IV Project Management	2	3	Project Management
	Elective group course	4	5	Elective Course III	4	5	Elective group course	4	8	Free Elective Course II	3	5	Free Elective Course II
	Elective group course	4	5	Elective group course	4	5	Elective group course	4	7	Elective Course S	8	12	Elective Course S
	Elective group course	3	5	Elective group course	3	5	Graduate Work	10	10	Graduate Work	10	10	Graduate Work
	Graduate Work	10		Modules Design and Construction of Floating Objects			Modules Automation			Modules Software Engineering			Computer Systems
	Mechanical Engineering Design and Mechatronics			Technology and Organization of Naval Architecture			Power Engineering						
	Computational Mechanics and Engineering												
	Technology Computational Engineering												
	Industrial Engineering and Management												
	Thermal Engineering												
	Process and Energy Engineering												
	Marine Engineering												
	Materials Engineering												



**POSLJEDIPLOMSKI SVEUČILIŠNI  
(DOKTORSKI) STUDIJI IZ PODRUČJA  
TEHNIČKIH ZNANOSTI, POLJA  
STROJARSTVA, BRODOGRADNJE,  
TEMELJNIH TEHNIČKIH ZNANOSTI I  
INTERDISCIPLINARNIH TEHNIČKIH  
ZNANOSTI I ZNANOSTI IZ POLJA ELEKTROTEHNIKE**

Na Tehničkom fakultetu izvode se dva poslijediplomska sveučilišna (doktorska) studija iz tehničkih znanosti - polja strojarstva, brodogradnje, temeljnih tehničkih znanosti i interdisciplinarnih tehničkih znanosti te polja elektrotehnike.

Završetkom ovih studija student stječe stupanj doktora znanosti što podrazumijeva superiorno poznavanje određenog znanstvenog područja unutar tehničkih znanosti i dokazanu sposobnost originalnog znanstvenog istraživanja. Njegove kompetencije obuhvaćaju vrso poznавanje literature i nerazjašnjenih problema iz određenog područja te sposobnost osmišljavanja i provođenja znanstvenoistraživačkog projekta do kraja, objavljuvanja rezultata istraživanja te prezentiranja tih rezultata drugim znanstvenicima, izražavanja svojih stavova u prisutnosti eksperta u području (na kongresima, seminarima, gostovanjima na drugim institucijama itd.). Njegove osobine obuhvaćaju i želju za dijeljenjem svojega znanja i iskustva mlađim generacijama studenata, kritičnost, u prvom redu prema vlastitom istraživanju, ali i radu drugih te sposobnost prilagođavanja dolazećim promjenama.

Nakon završetka doktorskog studija otvaraju se brojne mogućnosti nastavka znanstveno-istraživačkog rada na maticnoj instituciji ili srodnim institucijama u Hrvatskoj ili inozemstvu, kao i postdoktorskog usavršavanja. Otvaraju se i mogućnosti zapošljavanja u javnom i privatnom sektoru, posebno u onim gospodarskim subjektima s kojima Fakultet ima razvijenu suradnju, ali i drugdje u Hrvatskoj i inozemstvu.

Doktorski studij sastoji se od:

- provedbe znanstvenoistraživačkog rada pod nadzorom i uz pomoć mentora, odnosno sumentora koja rezultira izradom doktorskog rada (90 ECTS bodova),
- polaganja obveznih i izbornih predmeta propisanih studijskim programom doktorskog studija (42 ECTS bodova),
- boravka na drugim domaćim ili inozemnim

**POSTGRADUATE UNIVERSITY  
(DOCTORAL) STUDIES IN THE AREA  
OF ENGINEERING SCIENCES, IN THE  
FIELDS OF MECHANICAL ENGINEERING,  
NAVAL ARCHITECTURE, FUNDAMENTAL  
ENGINEERING SCIENCES AND  
INTERDISCIPLINARY ENGINEERING  
SCIENCES AND IN THE FIELD OF  
ELECTRICAL ENGINEERING**

At the Faculty of Engineering there are two postgraduate university (doctoral) studies in the area of Engineering Sciences, first one in the fields of Mechanical Engineering, Naval Architecture, Basic Engineering Sciences and Engineering Sciences and Interdisciplinary Engineering Sciences; and in the field of Electrical Engineering.

With the completion of the studies, the student gains the academic degree of Doctor of Science, has a superior knowledge of a particular scientific field within the engineering sciences and he will have proven to have the capability to and has proven to have original scientific research. His competences cover comprehension of literature and unsolved problems of a particular area and the ability to conduct a scientific project up to its completion, to publish the research results and to present these results to other scientists, the ability to express his opinion in the presence of experts in the research area (at conferences and similar gatherings). His characteristics include the desire to transfer his knowledge to the younger generations, criticism, in the first place towards his own work, but also towards the work of others and the ability to adapt to imminent changes.

Upon completion of the doctoral study, numerous possibilities for the continuation scientific work are present at the Faculty Engineering or other institutions in Croatia and abroad, as well as the possibility to continue education in postdoctoral study. Also, the possibility of finding an occupation in the public as well as in the private business sector becomes available (e.g., entities with whom the Faculty of Engineering has developed collaboration) as well as in other enterprises in Croatia and abroad.

The doctoral study consists of:

- scientific research work under the guidance and help of a mentor and possibly a co-mentor, which results in the completion of a doctoral thesis (90 ECTS credits),



- sveučilišnim ili znanstvenim institucijama u trajanju od najmanje 3 mjeseca (20 ECTS bodova),
- drugih aktivnosti koje obuhvaćaju prezentaciju znanstvenih rezultata na domaćim i međunarodnim znanstvenim skupovima, objavljivanje znanstvenih radova (28 ECTS bodova).

Nastava doktorskog programa iz područja tehničkih znanosti, polja strojarstva, brodogradnje, temeljnih tehničkih znanosti i interdisciplinarnih tehničkih znanosti organizirana je u sedam modula:

1. Proizvodno strojarstvo
2. Termoenergetika
3. Računarska mehanika
4. Projektiranje i gradnja plovnih objekata
5. Konstruiranje u strojarstvu
6. Osiguranje kvalitete i vođenje tehničkih sustava
7. Ekološko inženjerstvo i zaštita okoliša

Nastava doktorskog programa iz područja tehničkih znanosti, polja elektrotehnike organizirana je u dva modula:

1. Elektroničko-informacijski sustavi
2. Elektroenergetika i nove tehnologije

- sitting examinations for all obligatory and elective courses prescribed by the curriculum of the doctoral study (42 ECTS credits),
- visiting other Croatian or foreign universities or scientific institutions in the duration of at least three months (20 ECTS credits),
- other activities that include the presentation of scientific research results at national or international scientific gatherings or the writing of scientific papers (28 ECTS credits).

The curriculum of the doctoral study the area of Engineering Sciences, in the fields of Mechanical Engineering, Naval Architecture, fundamental Engineering Sciences and Interdisciplinary Sciences comprises seven modules:

1. Production Technologies in Mechanical Engineering
2. Thermal Energy Engineering
3. Computational Mechanics
4. Design and Building of Naval Vessels
5. Mechanical Engineering Design
6. Quality Assurance and Technical System Management
7. Ecological Engineering and Environmental Protection

The curriculum of the doctoral study in the area of Engineering Sciences, in the field of Electrical Engineering comprises two modules:

1. Electronic and information systems
2. Power Engineering and New Technologies





Poslijediplomski sveučilišni (doktorski) studij						
Potrijeđe tehničke znanosti, polje strojarsvo, brodogradnja, temeljni tehničke znanosti i interdisciplinarnne tehničke znanosti						
Zajednički predmeti						
Matematičko modeliranje i numeričke metode						
Statističke metode, stohastički procesi						
Moduli	Pravzadno strojarsvo	Termoenergetika	Računarska mehanika	Projektirane i građene plavnih objekata	Konstruiranje i strojarstvo	Osiguranje kvalitete i vodenje tehničkih sustava
Planiranje i vodenje prototvrdnje	IP iz topinskih znanosti	Elastomehanička i plavotomanička konstrukcija	Metodologija i projektiranja plavnih objekata	IP iz hidroatskih i pneumatiskih orijenacija	Upravljanje kvalitetom	Ekoložko inženjerstvo i zaštita okoliša
IP iz konvencionalne obrade odvajanjem testica	Numeričko modeliranje i optimizacija	MKE i optimizacija konstrukcija	Pomoćne sredstva i upravljanje plavnih objekata	Mediliranje razigrježnih konstrukcija	Planiranje i vodenje proizvodnje	Opća ekologija
Deforomabilnost i suvremeno oblikovanje deformiranjem	Optimizacija energetskih procesa	Viskoplastičnost i viskoelastičnost	IP iz osnovanja plavnih objekata	Nauka o konstruiranju	Statistička kontrola procesa	Zaštita mora i priroblja
IP iz konvencionalnih postupaka obrade	IP iz brodskih strujnih kompleksa	Stabilnosti konstrukcija	Integralna tehnologija gradnje broda	IP iz konstrukcijskih elemenata	Projektiiranje baze podataka	Kemijska akcelira
Razvojni i proizvodni menadžment	Temodinamička analiza procesa CAM, CAP, CAD/NC-CIM	Nelinearna analiza konstrukcija	IP iz metodologije gradnje plavnih objekata	Specijalni mehanički prjerenosici	Postovano odlaživanje	Upravljanje održivim razojem i zaštiti okoliša
Eksperimentalne metode u topinskom tehnici i termoenergetici	Eksperimentalne metode u topinskoj tehnici i termoenergetici	Kontaktna mehanika	IP iz opterećenja plavnih objekata	Konstrukcija i optimizacija upotpćastih prjerenosnika	Modeli stohastičkih procesa informacija	Zaštita okoliša i energetici i procesnoj industriji
Robotici i manipulatori	Temodinamika amesa i topinski uređaji	IP iz termomehaničke vibracije i trajnosti strojeva i	IP iz produljenje plavnih objekata	IP iz prjerenosika snage	Pouzdanošć tehničkih sustava	Instrumentacija analitičke tehnike i zaštiti okoliša
IP iz fleksibilnih proizvodnih sustava	IP iz tehnike hlađenja i tehnike ruknih temperature	IP iz dinamike plavnih objekata	IP iz transportnih sredstava u industriji	Inteligentni sustavi	Okoliš i gospodarstvo	
Inteligentni proizvodni sustavi	IP iz emenjivoča topline	Kinematička dinamika robota	Projektiranje strukture plavnih objekata	Metoda rubnih elemenata	Mikroekonomija i konkurenčnost	Zaštita okoliša u Tehnički hijadnji
Metode simulacije u Prozvodnji	IP iz goranja i klimatizacije	Zaštita od buke i vibracija strojeva i konstrukcija		Konkaktni problemi analizi konstrukcijskih elemenata	Inženjerstvo kvalitete	Fizika atmosfere
Optimizacija tehnoloških procesa	Obnovljivi izvori energije	Dinamika fluida		Principi konstrukcija i uslovi i ultrafiksna preciznosti	Sigurnost tehničkih sustava	
IP iz spilivanja materijala				Podatkovni elementi i mehanizmi		
Topilska obrada i intenzivno površina						
Kemijska materijala						
Korovača zaštita metala						
Mehanika pribredoma i unutarnjosti materijala						
Procesi oštećivanja materijala						

Postgraduate University Doctoral Study Area of Engineering Sciences: fields of Mechanical Engineering, Naval Architecture, Fundamental Engineering Sciences and Interdisciplinary Sciences							
Methodology of Scientific Works and Research							
Common courses							
Mathematical Modelling and Numerical Methods Optimization Methods Statistical Methods and Stochastic Processes							
<b>Modules</b>							
Production Technologies in Mechanical Engineering							
Planning and Processing of Manufacture	Thermal Energy Engineering	Computational Mechanics	Design and Building of Naval Vessels	Mechanical Engineering Design	Quality Assurance and Technical Systems Management	Ecological Engineering and Environmental Protection	
Selected Chapters on Conventional Machining Processes	Selected Topics on Thermal Sciences	Elastomechanics and Plastomechanics	Methodology of Ship Design	Selected Chapters on Hydrostatic and Pneumatic Transmissions	Quality Management	Selected Topics on Environment Protection	
Formability and Modern Forming Technology	Numerical Modeling of Heat Transfer	FEM and Optimization of Structures	Methodology of Ship Design	Modelling of Engineering Structures	Production Planning and Control	General Ecology	
Selected Chapters on Nonconventional Machining Processes	Optimization of Energy Processes	Viscoelasticity and Viscoplasticity	Selected Topics in Ship Design	Design Science	Statistical Process Control	Protection of Sea and Coastal Zone	
Robotics and Manipulators	Selected Topics of Marine Machinery Systems	Structural Stability	Integrated ship Production Technology	Selected Chapters on Machine Elements	Design of Data Base	Environmental Chemistry	
Simulation Methods in Production	Thermodynamic Analysis of Processes	Nonlinear Structural Analysis	Selected Topics on Floating Objects Production Methodology	Special/Mechanical Transmissions	Business Decision-making	Management of Sustainable Development and Environmental Protection	
Process Planning	Experimental Methods in Thermal and Power Engineering	Contact Mechanics	Design and Optimization of Gear Transmissions	Model of Stochastic Information Processes	Environment Protection in Energetics and Process Industry		
Material Chemistry	Thermodynamics of Mixtures and Thermal Devices	Advanced Thermomechanics	Selected Topics in Ship Propulsion Transmission	Reliability of Technical Systems	Instrumentation and Analytical Techniques in Environment Protection		
Material Chemistry	Selected Chapters on Flexible Production Systems	Vibrations and Durability of Machines and Structures	Selected Topics in Ship Dynamics	Selected Chapters on Maritime Transport Equipment and Dwellings	Intelligent Systems	Environment and Economics	
Material Chemistry	Intelligent Manufacturing Systems	Kinematics and Dynamics of Robots	Ship Structural Design	Boundary Element Method	Microeconomics and Competitiveness	Environmental Refrigeration	
Material Chemistry	Simulation Methods in Production	Interaction against noise and vibrations of machines and structures	Vibrations of Machines and Structures	Contact Problems in Machine Elements Analysis	Quality Engineering	Physics of the Atmosphere	
Material Chemistry	Corrosion and Metals Protection	Renewable energy Sources	Fluid Dynamics	Principles of High and Ultra-high Pressure Devices	Safety of Technical Systems		
Material Chemistry	Fracture Mechanics and Fatigue of Materials	Rational Energy Consumption	Computational Fluid Mechanics	Precision Devices Compliant Elements and Mechanisms			
Material Chemistry	Heat Treatment and Surface Engineering	Numerical Modeling of Combustion Process	Hydrodynamics of Turbomachines				
Material Chemistry	Processes of Damaging of Materials	Selected Chapters on Internal Combustion Engines	Turbulent Flow				
Unsteady Pipe Flow Modeling							
Material Chemistry	Durability and Reliability of Thermal Energy Systems	Modern Engine Design					
Material Chemistry	Selected Chapters on Thermal Turbomachines	Selected Chapters on Thermal Turbomachines					
Material Chemistry	Selected Chapters on Marine Energy Systems	Selected Chapters on Marine Energy Systems					



Poslijediplomski sveučilišni (doktorski) studij		
Područje tehničke znanosti, polje elektrotehnika		
Zajednički predmeti	Metodologija znanstvenoistraživačkog rada	
	Matematičko modeliranje i numeričke metode	
	Metode optimizacije	
	Statističke metode i stohastički procesi	
Moduli	Elektroničko-informacijski sustavi	Elektroenergetika i nove tehnologije
Predmeti po modulima	Analiza i obrada nestacionarnih signala	Modeli stohastičkih procesa informacija
	Elektromagnetsko modeliranje	Modeliranje sustava za distribuciju i potrošnju električne energije
	Fotoničke komponente	Pouzdanost tehničkih sustava
	Mjerenje i analiza kvalitete električne energije	Sustavi upravljanja sinkronim generatorima
	Mješovita obrada signala	Teorija informacija s primjenama
	Nelinearni sustavi automatskog upravljanja	Aktivne distribucijske mreže
	Ambijentalna inteligencija	Inteligentni elektroenergetski sustavi – Smart Grids
	Inteligentni sustavi	Izabrana poglavља iz energetskih komponenti i sustava obnovljivih izvora energije
	Projektiranje digitalnih sustava	Nova energetska paradigma
	Uslužna robotika	
Uvod u meko računarstvo i primjene		



Postgraduate University (Doctoral) Study		
Area of Engineering Sciences, Field of Electrical Engineering		
Common courses	Methodology of Scientific Work and Research	
	Mathematical Modelling and Numerical Methods	
	Optimization Methods	
	Statistical Methods and Stochastic Processes	
Modules	Electronic-Information Systems	Electric Power Systems and New Technologies
Module courses	Nonstationary Signal Analysis and Processing	Stochastic Information's Process Models
	Electromagnetic Modelling	Modelling of Electrical Power Distribution Systems
	Photonic Devices	Reliability of Technical Systems
	Measurement and Analysis of Electric Power Quality	Control of Synchronous Generators
	Mixed Signal Processing	Information Theory with Applications
	Nonlinear Control Systems	Active Distribution Networks
	Ambient Intelligence	Intelligent Power Systems - Smart Grids
	Intelligent Systems	Selected Chapters on Energy Components and Systems of Renewable Energy Sources
	Digital System Design	New Energy Paradigm
	Service Robotics	
Introduction to Soft Computing and Applications		

## **PREDDIPLOMSKI STRUČNI STUDIJ STROJARSTVA**

Preddiplomski stručni studij strojarstva ima za cilj osposobljavanje stručnjaka strojarstva za rad na izvršavanju složenih operativnih poslova kod razrade projekata strojarskih konstrukcija, odnosno složenih operativnih poslova planiranja, pripreme, unapređenja i kontrole tehnoloških i proizvodnih procesa i planiranja, organiziranja i vođenja proizvodnih odnosno energetskih postrojenja.

## **PREDDIPLOMSKI STRUČNI STUDIJ BRODOGRADNJE**

Preddiplomski stručni studij brodogradnje ima za cilj osposobljavanje stručnjaka brodogradnje za rad na izvršavanju složenih operativnih poslova pri razradi projekata plovnih objekata i objekata morske tehnologije i njihovih elemenata, odnosno složenih operativnih poslova planiranja, pripreme, unapređenja i kontrole procesa gradnje plovnih objekata.

## **PREDDIPLOMSKI STRUČNI STUDIJ ELEKTROTEHNIKE**

Preddiplomski stručni studij elektrotehnike ima za cilj osposobljavanje stručnjaka elektrotehnike za sudjelovanje u projektiranju i konstruiranju elemenata elektroenergetskih prostrojenja, odnosno telekomunikacijskih uređaja, sustava i mreža, ovisno o odabranoj izbornoj skupini predmeta.

## **UNDERGRADUATE VOCATIONAL STUDY OF MECHANICAL ENGINEERING**

The undergraduate vocational study of mechanical engineering has the aim to prepare the students for their profession as mechanical engineers, performing jobs that include complex operating tasks in mechanical design, planning, preparing, improvement and controlling of technological and production processes as well as planning, organizing and conducting of production or energy processes and plants.

## **UNDREGRADUATE VOCATIONAL STUDY OF NAVAL ARCHITECTURE**

The undergraduate vocational study of naval architecture has the aim to prepare the students for their profession as naval architect engineers, performing jobs that include complex operating tasks in designing vessels and other maritime objects and their elements as well as planning, improvement and controlling vessel building processes.

## **UNDERGRADUATE VOCATIONAL STUDY OF ELECTRICAL ENGINEERING**

The undergraduate vocational study of electrical engineering has the aim, depending upon the chosen elective course group, to prepare the students for their profession as electrical engineers in jobs which include designing and constructing elements of power plants, as well as telecommunication equipment, systems and networks.





Preddiplomski stručni studiji		S		Brodogradnja predmet		N		B		S		Elektrotehnika predmet		N		B	
S	strojarstvo	N	B			N	B			N	B			N	B		
I	Predmet	5	7	I	Matematika I	5	7	I	Matematika I	5	7	I	Matematika I	5	7		
	Matematika I	5	7		Mehanika I	5	7		Fizika	5	7			4	6		
	Mehanika I	5	7		Materijali	4	6		Osnove elektrotehnike ST I	4	6			5	8		
	Osnove elektrotehnike	3	5		Osnove elektrotehnike	3	5		Materijali i tehnološki postupci	3	5			3	4		
	Primjena računala ST	3	5		Primjena računala ST	3	5		Primjena računala ST	3	5			3	5		
II	Predmet	5	7	II	Matematika II	5	7	II	Matematika II	5	7	II	Osnove elektrotehnike ST II	5	7		
	Matematika II	5	7		Mehanika II	4	6		Mehanika II	4	6		Digitalna logika ST	4	6		
	Mehanika II	4	6		Čvrstoča	4	6		Čvrstoča	4	6			4	6		
	Tehničko crtanje	4	6		Tehničko crtanje	4	6		Tehničko crtanje	4	6		Mehanika i elementi konstrukcija ST	3	5		
	Tehnologija oruđade I	3	5		Plovni objekti	3	5		Plovni objekti	3	5		Tehničko dokumentiranje	3	5		
III	Organizacija i ekonomika	3	4	III	Organizacija i ekonomika	3	4	III	Organizacija i ekonomika	3	4	III	Mjerenja u elektrotehnici ST	5	7		
	Mehanika fluida ST	3	5		Mehanika fluida ST	3	5		Mehanika fluida ST	3	5		Elektr. komp. i osnovni sklopovi	5	7		
	Topilina	4	6		Topilina	4	6		Topilina	4	6		Linearne električne mreže	4	7		
	Tehnologija oruđade II	4	6		Brodske forme ST	4	7		Brodske forme ST	4	7		Mehatronika	4	6		
	Elementi strojeva I	4	6		Zavarivanje	3	5		Zavarivanje	3	5		Strani jezik I	2	3		
	Strani jezik I	2	3		Strani jezik I	2	3		Strani jezik I	2	3						
IV	Elementi strojeva II	4	6	IV	Hidrostatika broda	4	6	IV	Hidrostatika broda	4	6	IV	Osnove energetske elektronike	5	7		
	Obradni strojevi	3	5		Strukturni elementi broda	4	6		Strukturni elementi broda	4	6		Osnove automske regulacije	4	7		
	Topilinski strojevi i uređaji I	3	5		Tehnologija brodogradnje I	3	5		Tehnologija brodogradnje I	3	5		Kolegiji izborne skupine	5	8		
	Strani jezik II	2	3		Elementi strojeva I BG	3	5		Elementi strojeva I BG	3	5		Strani jezik II	2	3		
	Stručna praksa I	5			Strani jezik II	2	3		Strani jezik II	2	3		Stručna praksa I	5			
	Kolegiji izborne skupine	4	6		Stručna praksa I	5			Stručna praksa I	5							
V	Mjerna tehnika ST	3	5	V	Mjerna tehnika ST	3	5	V	Mjerna tehnika ST	3	5	V	Organizacija i ekonomika	3	4		
	Topilinski strojevi i uređaji II	3	5		Tehnologija brodogradnje II	5	6		Tehnologija brodogradnje II	5	6		Kolegiji izborne skupine	5	7		
	Hidraulički strojevi	3	5		Tehn. procesi gradnje i remonta broda	5	6		Tehn. procesi gradnje i remonta broda	5	6		Kolegiji izborne skupine	4	7		
	Zavarivanje	3	5		Konstrukcija broda	4	6		Konstrukcija broda	4	6		Kolegiji izborne skupine	4	6		
	Kolegiji izborne skupine	4	5		Oprema broda ST	4	7		Oprema broda ST	4	7		Kolegiji izborne skupine	4	6		
	Kolegiji izborne skupine	4	5														
VI	Slobodni kolegij	4	5	VI	Gradnja i odžavanje malih plovnih objekta	4	5	VI	Gradnja i odžavanje malih plovnih objekta	4	5	VI	Slobodni kolegij	4	5		
	Stručna praksa II	10			Slobodni kolegij	4	5		Slobodni kolegij	4	5		Stručna praksa II	10			
	Kolegiji izborne skupine	4	5		Stručna praksa II	10			Stručna praksa II	10			Kolegiji izborne skupine	4	5		
	Završni rad	10			Završni rad	10			Završni rad	10			Završni rad	10			

Undergraduate Vocational Studies		S Naval Architecture Course		S Electrical Engineering Course		
S Mechanical Engineering Course	N B	N	B	N	B	
I Mathematics I	5 7	I	Mathematics I	5 7	I	Mathematics I
I Mechanics I	5 7		Mechanics I	5 7		Physics
Materials	4 6		Materials	4 6		Fundamentals of Electrical Engineering VO I
Fundamentals of Electrical Engineering	3 5		Fundamentals of Electrical Engineering	3 5		Materials and Production Processes
Applied Computing VO	3 5		Applied Computing VO	3 5		Applied Computing VO
II Mathematics II	5 7	II	Mathematics II	5 7	II	Mathematics II
Mechanics II	4 6		Mechanics II	4 6		Fundamentals of Electrical Engineering VO II
Strength of Materials	4 6		Strength of Materials	4 6		Digital Logic VO
Technical Drawing	4 6		Technical Drawing	4 6		Mechanics and Structural Elements VO
Manufacturing Technology I	3 5		Marine Vessels	3 5		Technical Documenting
III Organization and Economics	3 4	III	Organization and Economics	3 4	III	Measurements in Electrical Engineering VO
Fluid Mechanics VO	3 5		Fluid Mechanics VO	3 5		Semiconductor Devices and Basic Microel. Circ.
Thermodynamics	4 6		Thermodynamics	4 6		Linear Electrical Circuits
Manufacturing Technology II	4 6		Ship Hull Forms VO	4 7		Mechatronics
Machine Elements I	4 6		Welding Engineering	3 5		Foreign Language I
Foreign Language I	2 3		Foreign Language II	2 3		
IV Machine Elements II	4 6	IV	Ship Hydrositics	4 6	IV	Fundamentals of Power Electronics
Machine Tools	3 5		Ship Structure	4 6		Fundamentals of Automatic Regulation
Heat Engines and Devices I	3 5		Shipbuilding Technology I	3		Elective group course
Foreign Language II	2 3		Machine Elements I / NA	3	5	Foreign Language II
Professional Practice I	5		Foreign Language II	2	3	Professional Practice I
Elective group course	4 6		Professional Practice I	5		
V Measuring Technology VO	3 5	V	Measuring Technology VO	3	5	Organization and Economics
Heat Engines and Devices II	3 5		Shipbuilding Technology II	5	6	Elective group course
Hydraulic Machines VO	3 5		Technological Processes of Ship Production and Re	5	6	Elective group course
Welding Engineering	3 5		Ship Construction	4	6	Elective group course
Elective group course	4 5		Ship Equipment VO	4	7	Elective group course
Elective group course	4 5					4 6
VI Free Elective Course	4 5	VI	Small Craft Building and Maintenance	4	5	Free Elective Course
Professional Practice II	10		Free Elective Course	4	5	Professional Practice II
Elective group course	4 5		Professional Practice II	10		Elective group course
Final Work	10		Final Work	10		Final Work



## 4 dekanat dean's office



### DEKAN | DEAN:

prof. dr. sc. / Prof. D. Sc. **Goran Turkalj**

Tehnički fakultet Sveučilišta u Rijeci  
Faculty of Engineering, University of Rijeka  
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Hrvatska | Croatia



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### PRODEKANI | VICE-DEANS:

prof. dr. sc. / Prof. D. Sc. **Anica Trp**  
nastava | academics

prof. dr. sc. / Prof. D. Sc. **Jasna Prpić-Oršić**  
znanstvena djelatnost | research activities

prof. dr. sc. / Prof. D. Sc. **Duško Pavletić**  
poslovni odnosi | business affairs



**POMOĆNICI DEKANA | DEAN'S ASSISTANTS:**

prof. dr. sc. / Prof. D. Sc. **Viktor Sučić**

izv. prof. dr. sc. / Assoc. Prof. D. Sc. **Lado Kranjčević**

doc. dr. sc. / Assist. Prof. D. Sc. **Neven Bulić**



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**URED DEKANA | DEAN'S OFFICE:**

**Sanja Prpić, dipl. oec.** / grad. economist  
voditeljica | head

**Tomo Vergić, dipl. iur.** / grad. in law.  
glavni tajnik | secretary general

I ZAVOD ZA P  
I ELEKTRON  
ZAVOD ZA  
BRODOG  
I INŽENJ  
TEHNOI  
ZAVOD  
ELEKT

AUTOMATIKU  
NIKU  
A  
RADNU  
ERSTVO MORSKE  
LOGIJE  
O ZA  
TROENERG

ZAVOD ZA  
PROIZVODNJU  
KOMPONENTA  
I ZAVOD

ZAVOD  
FILTRACIJE

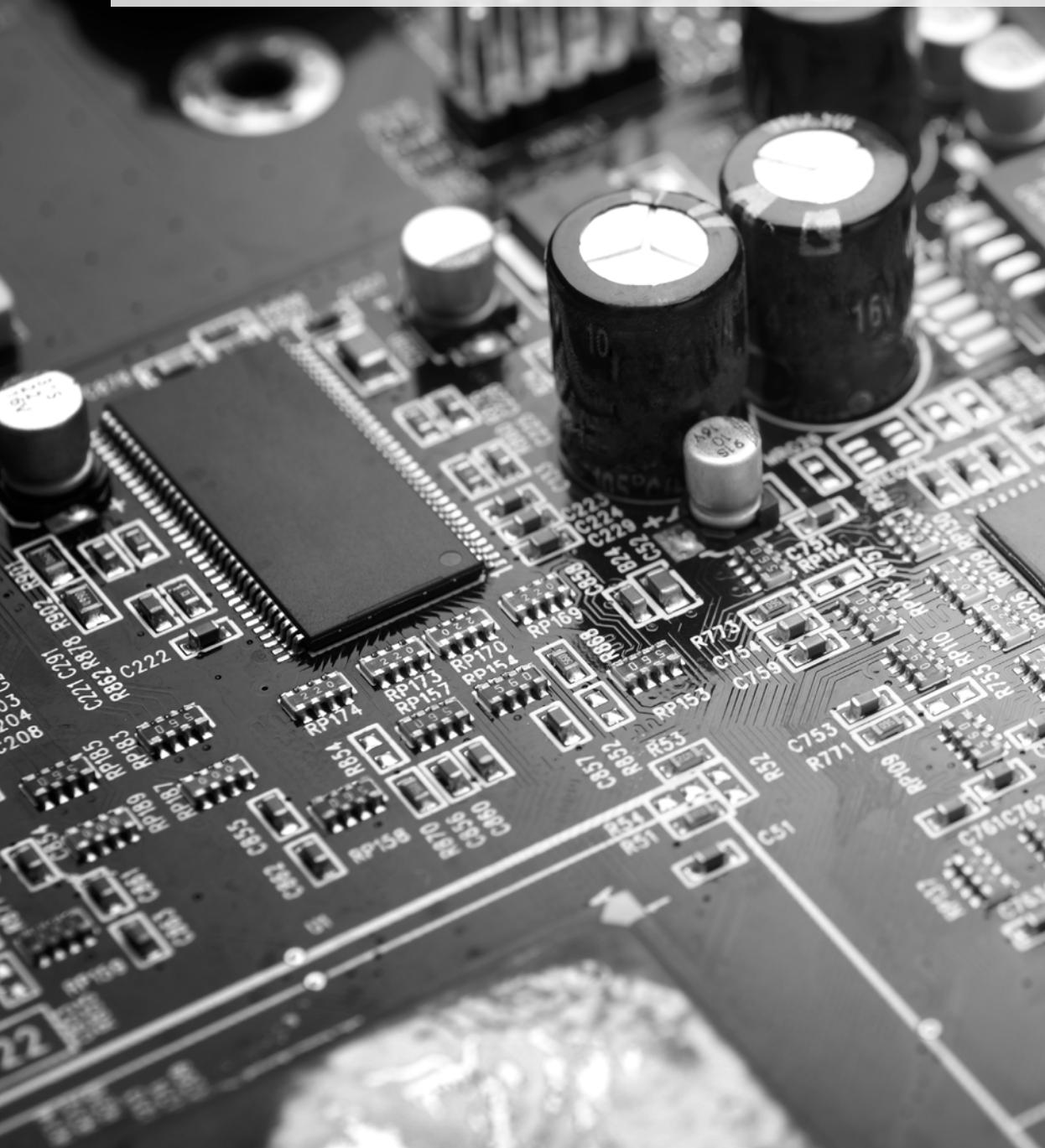
5 zavodi  
departments



5.<sup>1</sup>

# **zavod za automatiku i elektroniku**

## **department of automation and electronics**



**PREDSTOJNIK ZAVODA | DEPARTMENT HEAD:**

Izv. prof. dr. sc. / Assoc. Prof. D. Sc. **Saša Vlahinić**

<http://www.riteh.uniri.hr/ustroj/zavodi/zae/>

# **djelatnici**

## faculty and staff

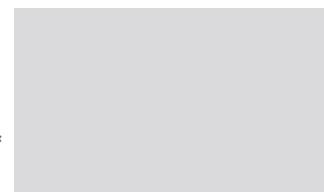
**REDOVITI PROFESORI | PROFESSORS**



**Zlatan Car**

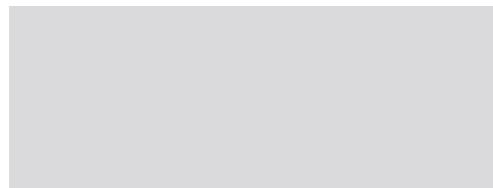
*umjetne inteligencije; inteligentni sustavi; robotika; CNC/NC obradni strojevi i robotika; konstrukcija i optimizacija alata i naprava; simulacija i optimizacija rada sustava i strojeva*  
*artificial intelligence; intelligent systems; CNC/NC machines & robotics; design of tools & fixtures; modeling, simulation and optimization of systems and machines*

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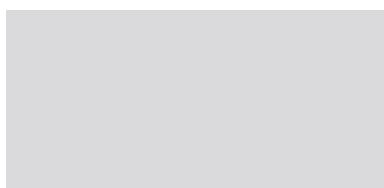
**Nino Stojković**

*analogna obrada signala; analogni filtri*  
*analog signal processing; analog filters*



**Viktor Sučić**

*statistička analiza i obrada signala*  
*statistical signal analysis and processing*

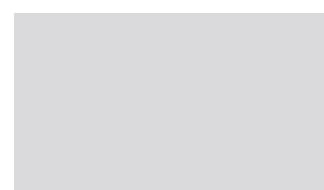


**IZVANREDNI PROFESORI | ASSOCIATE PROFESSORS**



**Vera Gradišnik**

*poluvodička elektronika; optoelektronika; poluvodički elementi;*  
*fotosenzori iz amorfног silicija; tankoslojni fotosenzori u*  
*biotehnologiji; digitalna logika*  
*semiconductor electronics; optoelectronics; semiconductor*  
*devices; amorphous silicon photosensors; thin film*  
*photosensors in biotechnology; digital logic*



Saša Vlahinić

mjerena u elektrotehnici; mjerena kvalitete električne energije; elektronička i virtualna instrumentacija  
electrical measurements; power quality measurements;  
electronic and virtual instrumentation



Miroslav Vrankić

digitalna obrada signala i slike; teorija valića; filterski sloganovi; asistivna tehnologija  
digital signal and image processing; wavelets and filter banks; assistive technology



**DOCENT** | ASSISTANT PROFESSOR

Neven Bulić

upravljanje elektromotornim pogonima;  
sistemi digitalnog upravljanja; automatizacija  
control of electrical drives;  
digital control systems; automation



**VIŠI ASISTENTI** | SENIOR ASSISTANTS

Nicoletta Saulig

vremensko-frekvencijska obrada signala  
time-frequency signal processing



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**ASISTENTI** | ASSISTANTS

Veljko Jardas

automatizacija  
automation



Karlo Radman

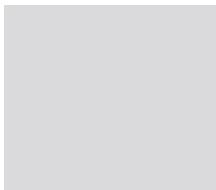
digitalni sustavi upravljanja; upravljanje električnih strojeva;  
razvoj bezležajnih motora; automatizacija  
digital control systems; control of electrical machines;  
development of bearingless drives; automation





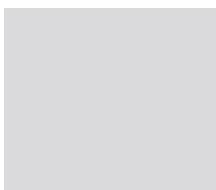
**Gordan Šegon**

*upravljanje elektromotornim pogonima;  
sistemi digitalnog upravljanja; automatizacija  
control of electrical drives; digital control systems; automation*



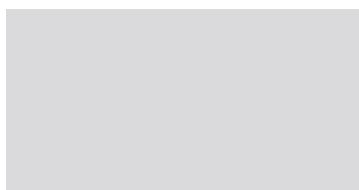
**Nikola Turk**

*upravljanje elektromotornim pogonima;  
sistemi digitalnog upravljanja; automatizacija  
control of electrical drives; digital control systems; automation*



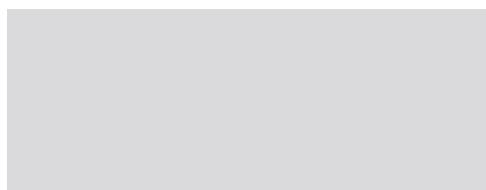
**Goran Tovilošić**

*analogni obrada signala; analogni filtri  
analog signal processing; analog filters*



**Sebastijan Blažević**

*automatika  
automation*

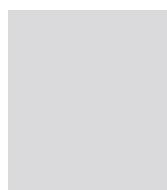


**ZNANSTVENI NOVACI | JUNIOR RESEARCHERS**



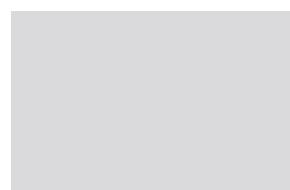
**Željka Milanović** poslijedoktorand | Postdoctoral Research Assistant

*poluvodičke komponente; usmjerena perkolacija; nanostrukture  
semiconductor devices; directed percolation; nanostructures*



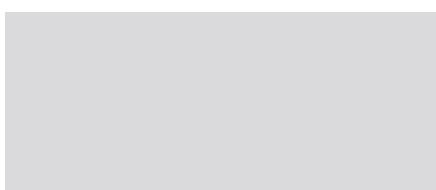
**Leon Šikulec**

*umjetne inteligencije; inteligentni sistemi; robotika; CNC/NC  
obradni strojevi  
artificial intelligence; intelligent systems; CNC/NC machines*



**Ivan Volarić**

*vremensko-frekvencijska obrada signala  
time-frequency signal processing*



**VANJSKI SURADNICI | ASSOCIATES****Antonio Linić***poluvodička elektronika; optoelektronika; fotosenzori iz amorfнog silicija;  
digitalna logika**semiconductor electronics; optoelectronics; amorphous silicon  
photosensors; digital logic***Dario Matika***automatika  
automation***nastava i znanost  
education and science**

*Nastava se izvodi iz područja automatike, robotike, elektronike, mjerjenja u elektrotehnici, mjerne instrumentacije te obrade signala.*

*Lectures in the field of automatic control, robotics, electronics, electrical measurements, instrumentation and signal processing.*

**KOLEGIJI NA PREDDIPLOMSKIM SVEUČILIŠNIM STUDIJIMA**

| UNDERGRADUATE UNIVERSITY COURSES

- Automatizacija
- Automatsko upravljanje
- Digitalna logika
- Električne mreže
- Elektronika
- Elektronika I
- Elektronika II
- Elementi automatizacije postrojenja
- Mjerena u elektrotehnici
- Modeliranje i simuliranje sustava
- Osnove regulacijske tehnike
- Računalom podržana mjerena
- Signali i sustavi
- Stručna praksa I

- Automation
- Automatic Control
- Digital Logic
- Electrical Circuits
- Electronics
- Electronics I
- Electronics II
- Elements of Plant Automation
- Electrical Measurements
- System Modelling and Simulation
- Basic of Automatic Control
- Computer Aided Measurement
- Signals and Systems
- Industrial Practice I

**KOLEGIJI NA DIPLOMSKIM SVEUČILIŠNIM STUDIJIMA**

| GRADUATE UNIVERSITY COURSES

- Analogna obrada signala
- Asistivna tehnologija
- Automatizacija postrojenja i procesa
- Automatizirana instrumentacija
- Digitalna obrada signala
- Digitalna obrada slike
- Industrijska robotika
- Mehatronički sustavi
- Optoelektronika
- Osnove robotike
- Primjena umjetne inteligencije
- Sustavi digitalnog upravljanja
- Sustavi kontrole
- Stručna praksa II
- Umjetna inteligencija u robotici

- Analog Signal Processing
- Assistive Technology
- Automation of Plants and Processes
- Automatic Instrumentation
- Digital Signal Processing
- Digital Image Processing
- Industrial robotics
- Mechatronic Systems
- Optoelectronics
- Fundamentals of Robotics
- AI Implementation
- Digital Control Systems
- Control Systems
- Industrial Practice II
- Artificial Intelligence in Robotics



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**KOLEGIJI NA PREDDIPLOMSKIM STRUČNIM STUDIJIMA**

| UNDERGRADUATE VOCATIONAL COURSES

- Automatizacija ST
- Digitalna logika ST
- Električne komponente i osnovni sklopovi
- Lineare električne mreže
- Mehatronika
- Mjerenja u elektrotehnici ST
- Osnove automatske regulacije
- Automation ST
- Digital Logic ST
- Semiconductors Devices and Basic Electronic Circuits
- Linear Electrical Circuits
- Mechatronics
- Electrical Measurements ST
- Fundamentals of Automatic Regulation

**KOLEGIJI NA POSLIJEDIPLOMSKIM (DOKTORSKIM) SVEUČILIŠNIM STUDIJIMA**

| POSTGRADUATE UNIVERSITY (DOCTORAL) COURSES

- Analiza i obrada nestacionarnih signala
- Fotoničke komponente
- Mjerenje i analiza kvalitete električne energije
- Mješovita obrada signala
- Nelinearni sustavi automatskog upravljanja
- Ambijentalna inteligencija
- Projektiranje digitalnih sustava
- Pouzdanost tehničkih sustava
- Inteligentni proizvodni sustavi
- Roboti i manipulatori
- Nonstationary Signal Analysis and Processing
- Photonic Devices
- Measurement and Analysis of Electric Power Quality
- Mixed Signal Processing
- Nonlinear Control Systems
- Ambient Intelligence
- Digital System Design
- Reliability of Technical Systems
- Intelligent Manufacturing Systems
- Robots and Manipulators

**ZNANSTVENOISTRAŽIVAČKI RAD | SCIENTIFIC RESEARCH**

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- Obrada signala  
Signal Processing
- Elektronika  
Electronics
- Mjerenje kvalitete električne energije  
Power quality measurements
- Robotika  
Robotics
- Umjetna inteligencija  
Artificial intelligence
- Automatizacija  
Automation
- Optoelektronika  
Optoelectronics
- Upravljanje elektromotornim pogonima  
Control of electrical drives
- Digitalni sustavi upravljanja  
Digital control systems



**PROJEKTI | PROJECTS**

- CEEPLUS; CIII-HR-0108-06-1112 - *Concurrent Product and Technology Development - Teaching, Research and Implementation of Joint Programs Oriented in Production and Industrial Engineering; (EU projekt mobilnosti/voditelj projekta)*  
CEEPLUS; CIII-HR-0108-06-1112 - *Concurrent Product and Technology Development - Teaching, Research and Implementation of Joint Programs Oriented in Production and Industrial Engineering; (EU mobility project; project manager)*
- CEEPLUS; CIII-RO-0202-05-1112 - *Implementation and utilization of e-learning systems in study area of production engineering in Central European Region; (EU projekt mobilnosti/suradnik na projektu)*  
CEEPLUS; CIII-RO-0202-05-1112 - *Implementation and utilization of e-learning systems in study area of production engineering in Central European Region; (EU mobility project; associate member)*
- CEEPLUS; CIII-CZ-0201-04-1112 - *Knowledge Bridge for Students and Teachers in Manufacturing Technologies; (EU projekt mobilnosti/suradnik na projektu)*  
CEEPLUS; CIII-CZ-0201-04-1112 - *Knowledge Bridge for Students and Teachers in Manufacturing Technologies; (EU mobility project; associate member)*
- CEEPLUS; CIII-PL-0007-07-1112 - *Modern Methods of the Constitution and Measurement of Geometrical Surface Structure; (EU projekt mobilnosti/suradnik na projektu)*  
CEEPLUS; CIII-PL-0007-07-1112 - *Modern Methods of the Constitution and Measurement of Geometrical Surface Structure; (EU mobility project; associate member)*
- C140.106, *Razvoj posebnih konstrukcija motora sa magnetskim ležajevima, upravljačke i energetske elektronike te njihove aplikacije u industriji, Područje4 - Pogoni i aktuatori, Neven Bulić, Karlo Radman 2014- (projekt Linz Center of Mechatronics, LCM GmbH), znanstveno-istraživački.*  
C140.106, *Bearingless Reluctance Slice Motors, Area4 - Drives and Actuators, Neven Bulić, Karlo Radman, 2014- (Linz Center of Mechatronics, LCM GmbH project) Research and scientific project.*
- Q-grid, *znanstveno-istraživački projekt financiran od strane industrije Danieli-Systec, Neven Bulić, 2014-2015.*  
Q-grid, *R&D project financed by industry Danieli-Systec, Neven Bulić, 2014-2015.*
- IPA Adriatic CBC ADTIATInn, *Jadranska mreža za unapređenje istraživanja razvoja i inovacija u stvaranju novih politika za održivu konkurentnost i tehnološke kapacitete malih i srednjih poduzeća*  
IPA, CBC ADTIATInn, *An Adriatic Network for Advancing Research Development and Innovation towards the Creation of new Policies for Sustainable Competitiveness and Technological Capacity of SMEs*
- *Komunikacija mislima za osobe s invaliditetom, Program provjere inovativnog koncepta (PoC) za znanstvenike i istraživače agencije HAMAG – BICRO, 2016. - 2017.*  
*Mind control for persons with disabilities, Proof of Concept - Public, HAMAG BICRO, 2016. - 2017.*

**PUBLIKACIJE | PUBLICATIONS****RADOVI U ČASOPISIMA | JOURNAL PAPERS**

- Volarić I., Stojković N., Vlahinić S., *Noise and Sensitivity Improvement using SC Filters Automatika, Journal for Control, Measurement, Electronics, Computing and Communications*  
ISSN: 0005-1144, 56 (4), 491-498, 2015



- Kobal M., Car Z., Ojsteršek M., *MPI applications' performances in native vs. virtualized environments using InfiniBand IPoLB virtualization and live migration*, Tehnički vjesnik/Technical Gazette 22, ISSN 1330-36511(Print), ISSN 1848-6339 (Online), Vol.22 No.6, 1495-1503, 2015, Slavonski brod, Hrvatska

**MEĐUNARODNI KONGRESI | INTERNATIONAL CONGRESSES**

- Volarić I., Sučić V., Jurdana I., *Algorithm Performance Analysis for Reconstruction of Sparse Time-Frequency Distributions from Compressive Sensed Ambiguity Function* Proceedings of International Conference on Innovative Technologies IN-TECH 2015, 1849-0662, 1, 26-29, 2015 Dubrovnik, Croatia
- Volarić I., Sučić V., Car Z., *A Compressive Sensing Based Method for Cross-Terms Suppression in the Time-Frequency Plane*, 2015 IEEE 15th International Conference on Bioinformatics and Bioengineering (BIBE), 1, 1-4, 2015, Belgrade, Serbia
- Marasović I., Saulig N.. Milanović Ž., *Renyi Entropy Based Failure Detection of Medical Electrodes*, Proceedings of the 23rd International Conference on Software, Telecommunications and Computer Networks (SoftCOM 2015)., 1-5, 2015, Bol, Croatia
- Čović M., Gradišnik V., Jeričević Ž., *The investigation of influence of localized states on a-Si:H p-i-n photodiode transient response to blue light impulse with blue light optical bias* Proceedings of 39th International Convention MIPRO 2016 - MEET - Microelectronics, Electronics and Electronic Technology, ISSN: 1847-3946, 1, 30-33, 2016, Rijeka, Croatia
- Blažević S., Pilićić S., Skoblar A., Žigulić R., Braut, S., *Analysis of Vibration of Vertical lathe Machining Centre*, 15th Youth Symposium on Experimental Mechanic, 1, 1-4, 2016., Italija
- Blažević S., Braut S., Car Z. and Žigulić R., *Modification on Active Magnetic Bearings Test-Rig for Implementing Different Control Algorithms*, Proceedings of International Conference on Innovative Technologies In-Tech 2016, ISSN: 1849-0662, 1, 89-92 2016, Czech Republic
- Andelić N., Car Z., Braut S., Žigulić, *Study of Influence of Geometry, Rotational Speed and Heat Generated by Wood Cutting on Vibrations of Circular Saw Blade*, Proceedings of International Conference on Innovative Technologies In-Tech 2016, ISSN: 1849-0662, 1, 105-108, 2016, Czech Republic
- Puškarić M., Car Z. and Janeš G., *Power Cost and Pricing Estimation of a Supercomputer Based Data Center*, Proceedings of International Conference on Innovative Technologies In-Tech 2016, ISSN: 1849-0662, 1, 247-250, 2016, Czech Republic
- Janeš G., Car Z., Puskaric M., Margan V., *Testing of Improved Genetic Algorithm in Ramberg-Osgood Material Model Parameters Identification*, Proceedings of International Conference on Innovative Technologies In-Tech 2016, ISSN: 1849-0662 , 1, 255-258, 2016, Czech Republic
- Sokac M., Margan V., Car Z., Budak I., *Comparative Analysis and Evaluation of Measurement Capabilities of Contact and Non-Contact Devices*, Proceedings of International Conference on Innovative Technologies In-Tech 2016, ISSN: 1849-0662, 1, 263-266, 2016, Czech Republic
- Zoubek M., Moulis T., Kudláček J., Herrman F., Car Z., *Potential of Anticorrosive Protection of Coating Systems Containing Magnesium Pigments*, Proceedings of International Conference on Innovative Technologies In-Tech 2016, ISSN: 1849-0662, 1, 331-334, 2016, Czech Republic
- Zoubek M., Moulis T., Kudláček J., Herrman F., Car Z. , *Potential of Anticorrosive Protection of Coating Systems Containing Magnesium Pigments*, Proceedings of International Conference on Innovative Technologies In-Tech 2016, ISSN: 1849-0662, 1, 331-334, 2016, Czech Republic



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## MEĐUNARODNA SURADNJA | INTERNATIONAL COLLABORATIONS

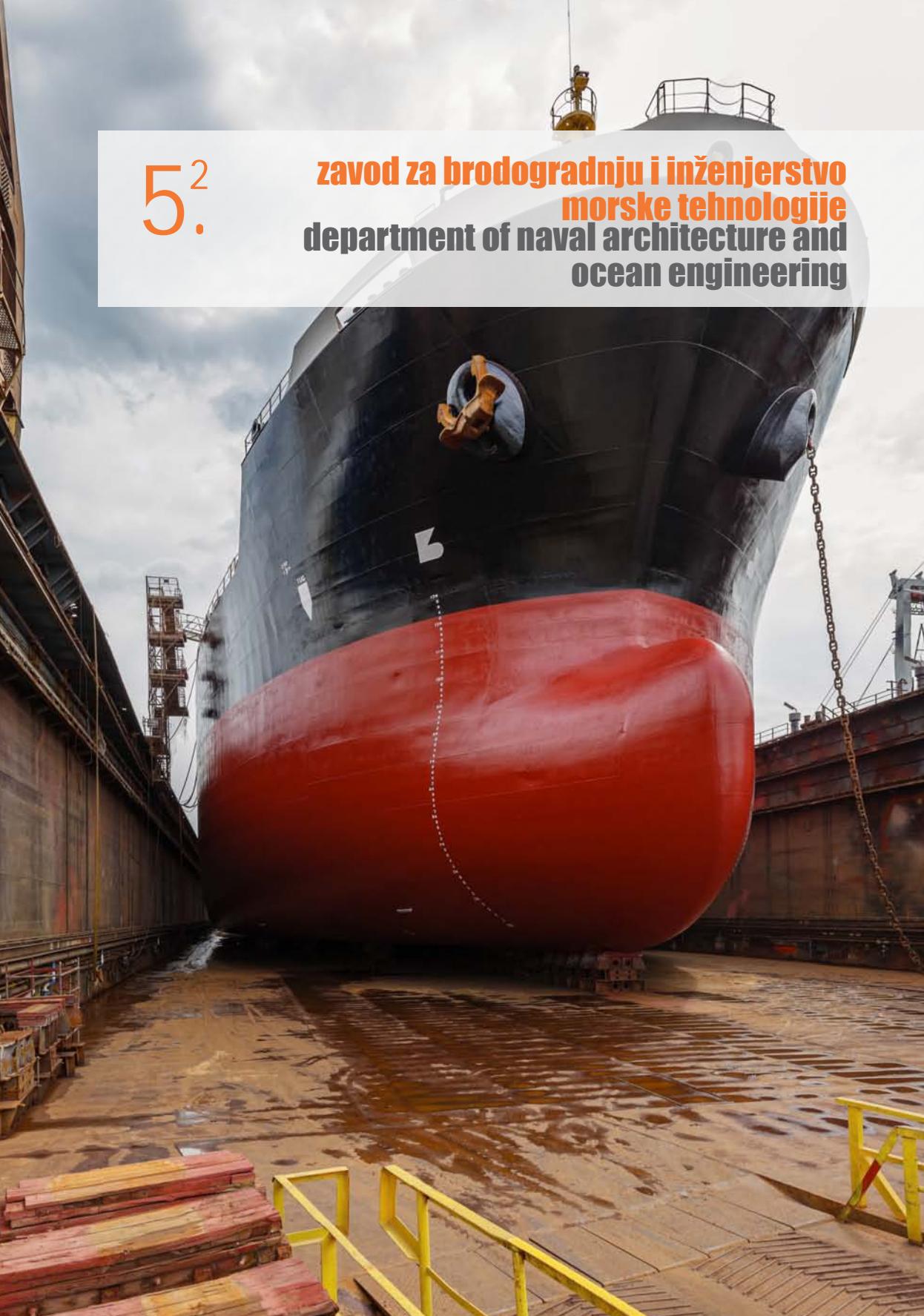
- *University of Queensland, Brisbane, Australija / Australia*
- *Elektrotehnički fakultet, Univerzitet Crne Gore, Podgorica, Crna Gora / Montenegro*
- *Technical University in Prague, Faculty of Mechanical Engineering, Republika Češka / Czech Republic*
- *Tomas Bata University in Zlín, Republika Češka / Czech Republic*
- *Technical University in Ostrava, Republika Češka / Czech Republic*
- *Vienna University of Technology, Austrija / Austria*
- *University in Miskolc, Mađarska / Hungary*
- *Budapest University of Technology and Economics, Mađarska / Hungary*
- *University of Žilina, Slovačka / Slovakia*
- *Poznan University of Technology, Poljska / Poland*
- *Kielce University of Technology, Poljska / Poland*
- *University of Ljubljana, Slovenija / Slovenia*
- *University of Novi Sad, Srbija / Serbia*
- *North University of Baia Mare, Rumunjska / Romania*
- *University of Kragujevac, Srbija / Serbia*
- *Danieli Automation, Italija / Italy*
- *Texas Instruments, USA / USA*
- *Linz Center of Mechatronics GmbH, Austrija / Austria*
- *Johannes Kepler Universität Linz, Austrija / Austria*





5<sup>2</sup>

**zavod za brodogradnju i inženjerstvo  
morske tehnologije**  
**department of naval architecture and  
ocean engineering**





**PREDSTOJNIK ZAVODA | DEPARTMENT HEAD:**

Prof. dr. sc. / Prof. D. Sc. **Roko Dejhalla**

<http://www.riteh.uniri.hr/ustroj/zavodi/zbimt/>

# **djelatnici**

## faculty and staff

**REDOVITI PROFESORI | PROFESSORS**



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**Bruno Čalić**

*plovnost i stabilitet broda; stabilitet broda u eksploraciji; osnivanje plovnih objekata I i II; objekti morske tehnologije; projektiranje malih plovnih objekata; brodski forme; hidrostatika broda; projektiranje malih plovnih objekata; metodologija projektiranja plovnih objekata; osnivanje plovnih objekata*  
*seaworthiness and stability of the ship; ship hull forms; ship hydrostatics; ship stability in exploitation; ship design I & II; ocean mobile and fixed structures; small craft design; methodology of floating objects design; selected chapter on floating objects design*



**Roko Dejhalla**

*otpor i propulzija plovnih objekata; brodski propulzori; gradnja i održavanje malih plovnih objekata; projektiranje malih plovnih objekata*  
*ship resistance and propulsion; ship propulsion devices; small craft building and maintenance; small craft design*



**Nikša Fafandjel**

*gradnja i opremanje plovnih objekata; tehnologija i organizacija brodogradnje; osnivanje brodogradilišta i proizvodnih procesa; oprema broda; upravljanje projektima u brodogradnji; analiza tržišta; tehnoško prognoziranje i ugovaranje plovnih objekata*  
*ship production and outfitting; shipbuilding technology and organisation; shipyard and production process design; ship equipment; project management in shipbuilding; market analysis; technological forecasting and contracting*



**Jasna Prpić-Oršić**

*pomorstvenost; njihanje i opterećenje plovnih objekata na morskim valovima; modeliranje okoliša i okolišnih opterećenja; dinamika pomorskih objekata; vibracije broda*  
*seakeeping; motions and sea loads of ships and off-shore structures; modeling of environment and environmental loads; marine structures dynamics; ship vibrations*

Albert Zamarin

*konstrukcija broda; čvrstoća broda; strukturalna analiza broda; opterećenje plovnih objekata na morskim valovima; projektiranje strukture plovnih objekata; konstrukcija malih plovnih objekata  
ship structure, ship strength; ship structural analysis; ship structural design; sea loads of ships and off-shore structures; small craft construction*



**DOCENTI | ASSISTANT PROFESSORS**

Marko Hadjina

*gradnja i opremanje plovnih objekata; tehnologija i organizacija brodogradnje; osnivanje brodogradilišta i proizvodnih procesa; simulacijsko modeliranje brodgrađevnih procesa; analiza tržišta; ugovaranje i tehnološko prognoziranje  
ship production and outfitting; shipbuilding technology and organisation; shipyard and production process design; shipyards' production processes simulation modelling; market analysis; contracting and technological forecasting*



Tin Matulja

*gradnja i opremanje plovnih objekata; tehnologija i organizacija brodogradnje; osnivanje brodogradilišta i proizvodnih procesa; oprema plovnih objekata  
ship production and outfitting; shipbuilding technology and organisation; shipyard and production process design; floating objects equipment and outfitting*



Anton Turk

*plovnost i stabilitet broda; brodske forme; hidrostatika broda; stabilitet broda u eksploataciji; vibracije broda  
seaworthiness and stability; ship hull forms; ship hydrostatics; ship stability in exploitation; ship vibrations*



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**VIŠI ASISTENTI | SENIOR ASSISTANTS**

Damir Kolić

*tehnologija i organizacija brodogradnje; vitka proizvodnja; tehnološki procesi brodogradnje; ugovaranje; rudarenje podacima; upravljanje projektima  
shipbuilding technology and organisation; lean manufacturing; technological processes of shipbuilding; contracts; data mining; project management*



Dunja Legović

*otpor i propulzija plovnih objekata; dinamika broda; brodske propulzori; pomorstvenost plovnih objekata; brodske forme; osnivanje plovnih objekata; objekti morske tehnologije; zaštita okoliša  
ship resistance and propulsion; ship dynamics; ship propulsion devices; seakeeping; ship hull forms; ship design; ocean mobile and fixed structures; environment protection*

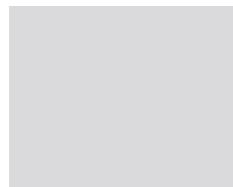


**STRUČNI SURADNIK | ASSOCIATES**



**Natalija Vitali**

*na znanstvenom projektu Hrvatske zaklade za znanost (HRZZ)*



**VANJSKI SURADNICI | ASSOCIATES**

**Robert Grubiša**

Brodograđevna industrija 3. MAJ | Shipbuilding industry 3. MAJ

*osnivanje plovnih objekata  
ship design*

**Željko Monjac**

Brodograđevna industrija 3. MAJ | Shipbuilding industry 3. MAJ

*tehnologija brodogradnje  
shipbuilding technology*

**Davor Sablić**

Brodograđevna industrija 3. MAJ | Shipbuilding industry 3. MAJ

*ugovaranje plovnih objekata  
ship negotiation process*

**Alan Klanac**

Jadrolinija

*strukturna analiza broda  
ship structural analysis*

**Mirela Marin**

M-Inženjering

*osnivanje plovnih objekata  
ship design*

**Romano Pičuljan**

Pičuljan Marine

*gradnja i održavanje malih plovnih objekata  
small craft building and maintenance*

**Ranka Vukasović Botica**

Mardesign

*čvrstoća broda; konstrukcija broda  
ship strength; ship structures*

## nastava i znanost education and science

*Nastava iz područja: projektiranje plovnih objekata, tehnologija i organizacija brodogradnje, konstrukcija plovnih objekata, hidromehanika plovnih objekata.*

*Program razlikovne edukacije za upis na diplomski sveučilišni studij brodogradnje.*

*Lectures in the field of: marine vessel design, technology and organization of shipbuilding, marine vessel construction, marine hydromechanics.*

*Program of lifelong learning for admission to the graduate university study of naval architecture.*

## KOLEGIJI NA PREDDIPLOMSKIM SVEUČILIŠNIM STUDIJIMA | UNDERGRADUATE UNIVERSITY COURSES

- Brodske forme
- Gradnja i održavanje malih plovnih objekata SV
- Hidrodinamika plovnih objekata I
- Konstrukcija broda I
- Konstrukcija broda II
- Oprema broda
- Osnove dinamike broda
- Osnove gradnje broda
- Plovnost i stabilitet broda
- Stručna praksa I
- Tehnologija brodogradnje
- Tehnološki procesi brodogradnje
- Uvod u plovne objekte
- Ship Hull Forms
- Small Craft Building and Maintenance UN
- Marine Hydrodynamics I
- Ship Structure I
- Ship Structure II
- Ship Equipment
- Basic Ship Dynamics
- Basics of Ship Production
- Seaworthiness and Stability of the Ship
- Industrial practice I
- Shipbuilding Technology
- Technology Processes of Shipbuilding
- Introduction to Marine Vessels

**KOLEGIJI NA DIPLOMSKIM SVEUČILIŠNIM STUDIJIMA**

| GRADUATE UNIVERSITY COURSES

- Brodski propulzori
- Osnivanje brodogradilišta
- Čvrstoća broda
- Dinamika pomorskih konstrukcija
- Hidrodinamika plovnih objekata II
- Konstrukcija malih plovnih objekata
- Metodologija gradnje plovnih objekata
- Objekti morske tehnologije
- Oprema malih plovnih objekata
- Opremanje i remont broda
- Organizacija i poslovanje brodogradilišta
- Osnivanje plovnih objekata I
- Osnivanje plovnih objekata II
- Pomorstvenost plovnih objekata
- Projektiranje malih plovnih objekata
- Stabilitet broda u eksploataciji
- Stručna praksa II
- Strukturna analiza broda
- Tehnološki proces gradnje broda
- Ugovaranje plovnih objekata
- Upravljanje projektima u brodogradnji
- Vibracije broda
- Ship Propulsion Devices
- Shipyard Design
- Ship Strength
- Dynamics of Off Shore Structures
- Marine Hydrodynamics II
- Small Craft Construction
- Methodology of Ship Production
- Ocean Mobile and Fixed Structures
- Small Crafts Equipment
- Ship Outfitting and Repair
- Shipyards Organisation and Management
- Ship Design I
- Ship Design II
- Seakeeping
- Small Craft Design
- Ship Stability in Exploitation
- Industrial practice II
- Ship Structural Analysis
- Technological Process of Shipbuilding
- Ship Negotiation Process
- Project Management in Shipbuilding
- Ship Vibrations

**KOLEGIJI NA PREDDIPLOMSKIM STRUČNIM STUDIJIMA**

| UNDERGRADUATE VOCATIONAL COURSES

- Brodske forme ST
- Gradnja i održavanje malih plovnih objekata
- Hidrostatika broda
- Konstrukcija broda
- Oprema broda ST
- Osnivanje plovnih objekata
- Plovni objekti
- Stručna praksa I
- Stručna praksa II
- Strukturni elementi broda
- Tehnologija brodogradnje I
- Tehnologija brodogradnje II
- Tehnološki procesi gradnje i remonta broda
- Ship Hull Forms VO
- Small Craft Building and Maintenance
- Ship Hydrostatics
- Ship Construction
- Ship Equipment ST
- Ship Design
- Marine Vessels
- Professional practice I
- Professional practice II
- Ship Structure
- Shipbuilding Technology I
- Shipbuilding Technology II
- Technological Processes of Shipbuilding and Repair



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**KOLEGIJI NA POSLIJEDIPLOMSKIM (DOKTORSKIM) SVEUČILIŠNIM STUDIJIMA**

| POSTGRADUATE UNIVERSITY (DOCTORAL) COURSES

- Integralna tehnologija gradnje broda
- Izabrana poglavља iz metodologije gradnje plovnih objekata
- Metodologija projektiranja plovnih objekata
- Izabrana poglavља iz osnivanja plovnih objekata
- Pomorstvenost i upravljivost plovnih objekata
- Izabrana poglavља iz dinamike plovnih objekata
- Izabrana poglavља iz otpora plovnih objekata
- Izabrana poglavља iz propulzije plovnih objekata
- Projektiranje strukture plovnih objekata
- Integrated Ship Production Technology
- Selected Topics in Floating Objects Production Methodology
- Methodology of Ship Design
- Selected Topics in Ship Design
- Seakeeping and Manoeuvrability
- Selected Topics in Marine Dynamics
- Selected Topics in Ship Resistance
- Selected Topics in Ship Propulsion
- Ship Structural Design

**ZNANSTVENOISTRAŽIVAČKI RAD | SCIENTIFIC RESEARCH**

- *Upravljanje elektromotornim pogonima*  
Control of electrical drives
- *Digitalni sustavi upravljanja*  
Digital control systems
- *Hidrodinamičko opterećenje i odziv pomorskih objekata na morskim valovima*  
Hydrodynamic loads and response of marine objects
- *Projektiranje strukture broda, nove tehnologije kod projektiranja i preinaka brodskih konstrukcija, tehnologičnost kod projektiranja i izrade brodskih konstrukcija*  
Ship structural design, new technologies in ship structural design and conversions, technologicality in ship structure design and construction
- *Otpor i propulzija plovnih objekata, hidrodinamičke optimizacije*  
Ship resistance and propulsion, hydrodynamic optimizations
- *Primjena naprednih tehnologija i metoda gradnje i opremanja plovnih objekata; organizacija brodograđevnog poslovnog i proizvodnog procesa; osnivanje i unapređenje brodogradilišta i proizvodnih procesa, primjena simulacijskog modeliranja, višekriterijskog odlučivanja i LEAN metodologije za unapređenje brodograđevnog procesa, analiza tržišta; ugovaranje i tehnoško prognoziranje*  
Application of advanced technology and methods in ship construction and outfitting; organization of shipbuilding business and production process, the establishment and improvement of the shipyards and manufacturing processes, the application of simulation modeling, multicriteria decision making and LEAN methodologies to improve the shipbuilding process, market analysis, contracting and technological forecasting



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**PROJEKTI | PROJECTS**

- Numeričko modeliranje hidrodinamičkog opterećenja i odziva pomorskih objekata, 13.09.1.1.05, Sveučilište u Rijeci, Jasna Prpić-Oršić, 2013., znanstvenoistraživački Numerical modeling of hydrodynamic loads and response of marine objects, 13.09.1.1.05, University of Rijeka, Jasna Prpić-Oršić, 2013., research and scientific project
- Energetski učinkovita i sigurna eksploracija broda (SHOPERA), FP7 projekt, Apostolos Papanikolaou (Jasna Prpić-Oršić), 2013., znanstvenoistraživački Energy Efficient Safe SHip OPERAtion (SHOPERA), FP7 project Grant Agreement number 605221, Apostolos Papanikolaou (Jasna Prpić-Oršić), 2013., research and scientific project
- Ekološki pristup projektiranju broda i planiranju optimalne rute (GASDORP) O-1673-2014, Hrvatska zaklada za znanost, Jasna Prpić-Oršić, 2014-2018, znanstvenoistraživački Greener Approach to Ship Design and Optimal Route Planning (GASDORP) O-1673-2014, Croatian Science Foundation, Jasna Prpić-Oršić, 2014-2018, research and scientific project
- Unapređenje metodologije projektiranja procesa gradnje broda, Potpora znanstvenim istraživanjima za 2013. g. Sveučilišta u Rijeci, broj potpore: 13.09.1.1.06. Voditelj istraživačkog tima: prof. dr. sc. Nikša Fafandjel, dipl. ing., 2013.-2014. Improving the methodology of ship construction process design, Support for scientific research in 2013., University of Rijeka, No.: 13.09.1.1.06. Head of the research team: prof. dr. sc. Niksa Fafandjel, 2013.-2014.

- *Unapređenje metodologije projektiranja procesa gradnje broda, Potpora znanstvenim istraživanjima za 2015. g. Sveučilišta u Rijeci, broj potpore: 13.09.1.1.06. Voditelj istraživačkog tima: prof. dr. sc. Nikša Fafandjel, dipl. ing., 2015.-2016.*  
*Improving the methodology of ship construction process design, Support for scientific research in 2015., University of Rijeka, No.: 13.09.1.1.06. Head of the research team: prof. dr. sc. Niksa Fafandjel, 2015.-2016.*

**PUBLIKACIJE | PUBLICATIONS****RADOVI U ČASOPISIMA | JOURNAL PAPERS**

- Prpić-Oršić, J., Vettor, R., Faltinsen, O. M., Guedes Soares, C., *Route choice and operating conditions influence on fuel consumption and CO<sub>2</sub> emission*, *Journal of Marine Science and Technology*, ISSN: 1671-9433 (Print) 1993-5048 (Online) DOI, 10.1007/s00773-015-0367-5, 2016, Harbin
- Valčić, M., Prpić-Oršić, J. *Methodology of wind loads estimation on marine objects based on elliptic Fourier descriptors and neural networks hybrid method*, *Ocean Engineering*, 0029-8018 122, 222-240, 2016, Oxford
- Prpić-Oršić, J., Faltinsen, O. M., Parunov, J., *Influence of operability criteria limiting values on ship speed*, *Časopis Brodogradnja*, 0007-215X, 67(3), 37-58, 2016, Zagreb
- Čalić, B., Turk, A. Petrović, I., *Intact and Damage Stability of the Oil Carrier*, *Journal of Maritime & Transportation Sciences* ISSN 0554-6397, 1, 149-167, 2016, Rijeka
- Matulja, T., Zamarin, A., Matulja, R. *Boat Equipment Design Methodology Based on QFD and FEA*, *Journal of Maritime & Transportation Science*, ISSN 0554-6397, 49-50(1), 87-100, 2015, Rijeka
- Hadjina, M., Matulja, T., Rubeša, R., *Methodology For The Ship Exploitation Feedback Inclusion For Improving The Ship Design And Production Process Based On Adjusted QFD Method*, *Journal of Maritime Research*, ISSN 1332-0718, 29(2), 107-114, 2015, Rijeka
- Matulja, T., Hadjina, M., Kolić, D., *Shipyard Production Processes Re-Design Methodology Based on Expert Approach and Simulation Modeling*, *Journal of Maritime & Transportation Science*, ISSN 0554-6397, 51(1), 25-41, 2015, Rijeka
- Hadjina, M., Fafandjel, N., Matulja, T., *Shipbuilding Production Process Design Methodology Using Computer Simulation*, *Brodogradnja*, ISSN 0007-215X, 66(2), 77-91, 2015, Zagreb
- Matulja, T., Jedretić, L., Hadjina, M. *Influence Analysis of Deck Equipment Positioning on Performances in Sailing*, *Journal of Maritime & Transportation Science*, ISSN 0554-6397 Special (1), 101-109, 2016, Rijeka
- Bećirević, A., Kolić, D., Matulja, T., *Gant Chart of Vessel Docking onto a Floating Dry Dock* *Journal of Maritime & Transportation Science*, ISSN 0554-6397, Special (1), 121-129, 2016 Rijeka
- Vukman, M., Kolić, D., Fafandjel, N., Hadjina, M., *DFP analiza izrade robotiziranih međuproizvoda u brodogradnji*, *Journal of Maritime & Transportation Science*, ISSN 0554-6397, Special (1), 111-119, 2016, Rijeka
- Kolić, D., Fafandjel, N., Lawrence, Yao Y., *Data mining methodology for determining the optimal model of cost prediction in ship interim product assembly*, *Brodogradnja*, ISSN 0007-215X 67(1) 1-18, 2016, Zagreb



## MEĐUNARODNI KONGRESI | INTERNATIONAL CONGRESSES

- Prpić-Oršić, J., Valčić, M., *Sensitivity analysis of wind load estimation method based on elliptic Fourier descriptors*, Proceedings of Maritime Technology and Engineering - MARTECH 2016 978-1-138-03000-8, 151-160, 2016, Lisabon
- Vitali, N., Prpić-Oršić, J., Guedes Soares, J., *Uncertainties related to the added resistance estimation*, Proceedings of Maritime Technology and Engineering - MARTECH 2016, 978-1-138-03000-8, 151-160, 2016, Lisabon
- Valčić, M., Prpić-Oršić, J., Vučinić, D., *Application of pattern recognition method for estimating wind loads on ships and marine objects*, 10th International Conference on Advanced Computational Engineering and Experimenting ACE-X 2016, 2016, Split
- Kolić, D., Storch, R. L., Fafandjel, N., *Additive manufacturing in compliance with lean shipbuilding*, American Society of Naval Engineers - ASNE Day 2016, 5-15, 2016, Arlington, Virginia, USA
- Kolić, D., Storch, R. L., Fafandjel, N., *Optimizing shipyard interim product assembly using a value stream mapping methodology*, World Maritime Technology Conference Papers / Society of Naval Architects and Marine Engineers , 1-10, 2015, Providence, Rhode Island, USA.
- Kolić, D., Lawrence, Yao Y., Neuberg, R., Storch, R. L., Fafandjel, N., *Data mining to predict laser hybrid laser arc welding improvements in ship interim product assembly*, International Conference on Computer Applications in Shipbuilding - ICCAS - Royal Institute of Naval Architects, ISBN:978-1-909024-43-4, 137-144, 2015, Breman, Germany
- Stanić, V., Kolić, D., Fafandjel, N., *Value stream mapping to meet the needs of multiple industries*, Proceedings of the 5th International Conference Production Engineering and Management ISBN:978-3-941645-11-0, 159-168, 2015, Trieste, Italy



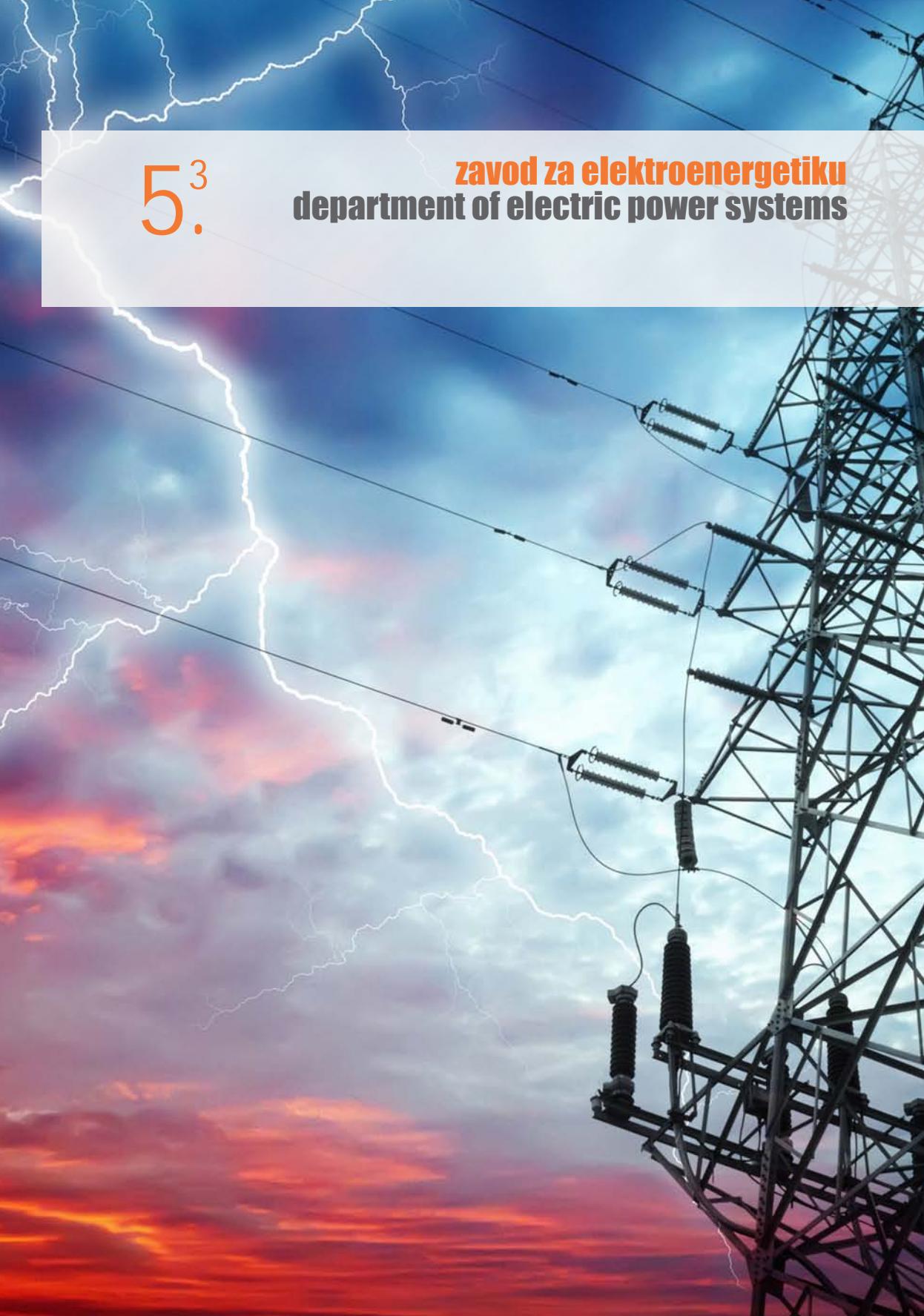
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## MEĐUNARODNA SURADNJA | INTERNATIONAL COLLABORATIONS

- AALTO University School of Engineering, Helsinki, Finska / Finland
- Norwegian University of Science and Technology, Center of Ships and Ocean Structures, Norwegian Center of Excellence, Trondheim, Norveška / Norway
- Technical University of Lisbon, Instituto Superior Tecnico, Lisbon, Portugal / Portugal
- University of Technology, Krakow/Krakov, Polska / Poland
- University of Trieste, Department of Naval Architecture and Ocean Engineering, Trieste, Italija / Italy
- University of Washington, Department of Industrial and Systems Engineering, Seattle, SAD / USA
- University of Naples, Naples, Italija / Italy
- Columbia University, Department of Mechanical Engineering, New York City, SAD / USA
- Vrije Universiteit Brussel, Brussel, Belgija / Belgium

5.<sup>3</sup>

**zavod za elektroenergetiku**  
**department of electric power systems**





**PREDSTOJNIK ZAVODA | DEPARTMENT HEAD:**

Doc. dr. sc. / Assist. Prof. D. Sc. **Dubravko Franković**

<http://www.riteh.uniri.hr/ustroj/zavodi/zee/>

# **djelatnici**

## faculty and staff

**REDOVITI PROFESORI | PROFESSORS**

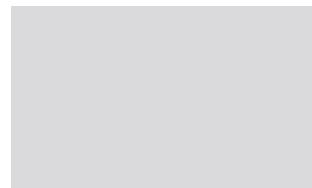


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**Livo Šušnjić**

*električni strojevi; primjena MKE u području elektromagnetizma  
electrical machines; FEM application in the electromagnetics*

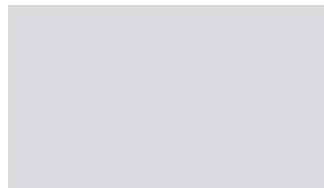


**IZVANREDNI PROFESORI | ASSOCIATE PROFESSORS**



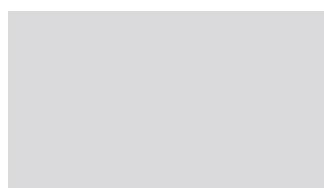
**Srđan Skok**

*nadzor, zaštita i vođenje elektroenergetskog sustava; napredne mreže; električna postrojenja  
power system monitoring, protection and control; smart grids; electric facilities*



**Alfredo Višković**

*elektroenergetski sustavi; tržiste električne energije; razvoj energetskih projekata  
electric power systems; electricity markets; power generation project development*

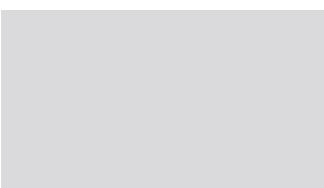


**DOCENTI | ASSISTANT PROFESSORS**



**Dubravko Franković**

*elektroenergetski sustavi; elektrane; projektiranje; obnovljivi izvori energije; fotonaponske elektrane  
electric power systems; power plants; electrical design; renewable energy sources; photovoltaic systems*



**Vedran Kirinčić**

*nadzor, zaštita i vođenje elektroenergetskog sustava;  
napredne mreže; električna postrojenja  
power system monitoring; protection and control;  
smart grids; electric facilities*



**Saša Sladić**

*energetska elektronika; elektromotorni pogoni; mehatronika;  
nove tehnologije i obnovljivi izvori energije  
power electronic; electric drives; mechatronics;  
new technologies and renewable energy sources*



**VIŠI PREDAVAČI | SENIOR LECTURERS**

**Branka Dobraš**

*nadzor i vođenje elektroenergetskog sustava; modeliranje  
procesnih informacija; objektno orijentirano modeliranje  
electric power system control; process information  
modelling; object oriented modeling*



117

**Marijana Živić-Đurović**

*kvaliteta električne energije; pouzdanost; mikromreže  
quality of electricity supply; reliability; microgrids*



**ZNANSTVENI NOVAK | JUNIOR RESEARCHER**

**Andrea Andrijašević** poslijedoktorand | Postdoctoral Research Assistant

*digitalna obrada signala govora; akustika prostora; elektroakustički pretvarači  
digital processing of speech signals; room acoustics; electroacoustic transducers*



**ASISTENTS | ASSISTANTS**

**Vladimir Franki**

*elektroenergetski sustavi; tržište električne energije;  
razvoj energetskih projekata  
electric power systems; electrical engineering fundamentals*





Ingrid Sterpin

elektroenergetski sustavi  
electric power systems



VANJSKI SURADNICI | ASSOCIATES

Marin Antunović

Goran Klobučar

Vitomir Komen HEP ODS | HEP DSO

Ranko Lončarić

Neven Pavlović T-HT grupa | T-HT group

Vladimir Valentić HEP OPS | HEP TSO

Zoran Zbunjak HEP OPS | HEP TSO

## nastava i znanost education and science

Nastava se izvodi iz područja osnova elektrotehnike, elektroenergetike i elektrostrojarstva.

CO: Elektroenergetika

Lectures in the field of electrical engineering fundamentals, power engineering and electrical machines and drives.

LLL: Power Systems



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### KOLEGIJI NA PREDDIPLOMSKIM SVEUČILIŠNIM STUDIJIMA

| UNDERGRADUATE UNIVERSITY COURSES

- Električna postrojenja
- Električni strojevi
- Elektroenergetske mreže
- Elektromotorni pogoni
- Elektrotehnika R
- Energetska elektronika
- Modeliranje procesnih informacijskih sustava
- Osnove elektrotehnike I
- Osnove elektrotehnike II

- Electric Facilities
- Electrical Machines
- Electric Power Networks
- Electrical Drives
- Electrical Engineering R
- Power Electronics
- Modeling of process information systems
- Fundamentals of Electrical Engineering I
- Fundamentals of Electrical Engineering II

### KOLEGIJI NA DIPLOMSKIM SVEUČILIŠNIM STUDIJIMA

| GRADUATE UNIVERSITY COURSES

- Brodská elektrotechnika
- Elektrane
- Elektroenergetske sustavi
- Modeliranje procesne informatike električnih postrojenja
- Numerička analiza u elektromagnetizmu
- Prijenos i distribucija električne energije
- Projektiranje električnih postrojenja
- Teorijska elektrotehnika
- Vođenje elektroenergetskog sustava
- Zaštita i automatika električnih postrojenja
- Procesni informacijski sustavi u elektroenergetici
- Tržište električne energije

- Ships Electrical Engineering
- Power Plants
- Electric Power Systems
- Modeling of Process Informatics in Power System
- Numerical Analysis in Electromagnetism
- Transmission and Distribution of Electrical Energy
- Electric Power Substation Design
- Theoretical Electrical Engineering
- Power System Control
- Protection and Automation of Electrical Installations
- Process Information Systems in Power Engineering
- Electricity Market

**KOLEGIJI NA PREDDIPLOMSKIM STRUČNIM STUDIJIMA**

| UNDERGRADUATE VOCATIONAL COURSES

- Električne energetske mreže
- Elektroenergetska postrojenja
- Elementi elektroenergetskih postrojenja
- Izgradnja i održavanje elektroenergetskih postrojenja
- Osnove električnih strojeva
- Osnove elektrotehnike
- Osnove elektrotehnike ST I
- Osnove elektrotehnike ST II
- Osnove energetske elektronike
- Osnove projektiranja elektroenergetskih postrojenja
- Stručna praksa I
- Stručna praksa II
- Zaštita električnih postrojenja
- Electrical Power Networks
- Electric Power Plants
- Electrical Power Facilities Equipment
- Construction and Maintenance of Power Plants
- Fundamentals of Electrical Machines
- Fundamentals of Electrical Engineering
- Fundamentals of Electrical Engineering ST I
- Fundamentals of Electrical Engineering ST II
- Fundamentals of Power Electronics
- Fundamentals of Electric Power Facilities Design
- Professional practice I
- Professional practice II
- Power System Protection

**KOLEGIJI NA POSLIJEDIPLOMSKIM (DOKTORSKIM) SVEUČILIŠNIM STUDIJIMA**

| POSTGRADUATE UNIVERSITY (DOCTORAL) COURSES

- Modeli stohastičkih procesa informacija
- Modeliranje sustava za distribuciju i potrošnju električne energije
- Aktivne distribucijske mreže
- Inteligentni elektroenergetski sustavi – Smart Grids
- Izabrana poglavlja iz energetskih komponenti i sustava obnovljivih izvora energije
- Nova energetska paradigma
- Models of Stochastic Information Processes
- Modeling of Electrical Power Distribution Systems
- Active Distribution Networks
- Intelligent Power Systems - Smart Grids
- Selected Chapters on Energy Components and Systems of Renewable Energy Sources
- New Energy Paradigm

**ZNANSTVENOISTRAŽIVAČKI RAD | SCIENTIFIC RESEARCH**

- Automatsko vođenje elektroenergetskog sustava; Napredne mreže; Mikromreže; Modeliranje elektroenergetskog sustava u stvarnom vremenu; Nadzor, zaštita i upravljanje elektroenergetskog sustava u stvarnom vremenu; Sinkronizirana mjerenja  
System Integrity protection Scheme; Smart Transmission Grid; Microgrids; Power System Modelling in Real Time; Wide Area Monitoring, Protection and Control of the Power System in Real Time; Synchronized Measurement
- Estimacija stanja elektroenergetskog sustava; Nadzor, zaštita i upravljanje elektroenergetskog sustava u realnom vremenu; Tehnologija sinkroniziranih mjerenja fazora  
Power System State Estimation; Wide Area Monitoring, Protection and Control of the Power System in Real Time; Synchronized Measurement Technology
- Razvoj suvremenih učinskih DC/DC i DC/AC pretvarača  
Design of modern power DC/DC and DC/AC converters
- Obnovljivi izvori energije, Fotonaponski sustavi, Napredne mreže  
Renewable energy systems, Photovoltaic systems, Smart grid



**PUBLIKACIJE** | PUBLICATIONS

**RADOVI U ČASOPISIMA** | JOURNAL PAPERS

- Franki, V., Višković, A., *Energy security, policy and technology in South East Europe: Presenting and applying an energy security index to Croatia*, Energy, 0360-5442, 90, 494-507, 2015, Oxford, Engleska
- Kirinčić, V., Skok, S., Franković, D., *A Synchrophasor Assisted Hybrid State Estimator* Journal of Electrical Engineering Elektrotechnicky casopis, 1335-3632, 67, 103–110, 2016, Slovačka

**MEĐUNARODNI KONGRESI** | INTERNATIONAL CONGRESSES

- Gašparini, K., Giernacki, W., Sladić, S., *Power Factor Correction with ARM CORTEX-M Microprocessors*, Automation 2016, Springer International Publishing Switzerland 2016978-3-319-29356-1, 1, 4, 2016
- Mikac, E., Kirincic, V., Skok, S., *Intelligent Protection Scheme for the Part of the Transmission Power System*, The 5th International Youth Conference on Energy, 9781467371735, 1-5 2015, Pisa, Italija

**POZVANA PREDAVANJA** | INVITED LECTURES

- Kirinčić, V., Franković, D., Radulović, D., *Održivi razvoj otoka za nisko-ugljično društvo MIPRO, HEP seminar - Informacijska i komunikacijska tehnologija u elektroprivrednoj djelatnosti 2016* Rijeka, Hrvatska



5.<sup>4</sup>

**zavod za industrijsko inženjerstvo i  
management**  
**department of industrial engineering  
and management**





**PREDSTOJNIK ZAVODA | DEPARTMENT HEAD:**

Prof. dr. sc. / Prof. D. Sc. **Milan Ikonić**

<http://www.riteh.uniri.hr/ustroj/zavodi/ziim/>

# **djelatnici**

## faculty and staff

**REDOVITI PROFESORI | PROFESSORS**

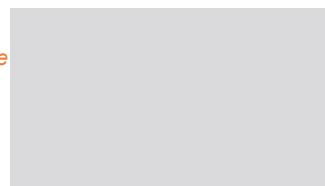


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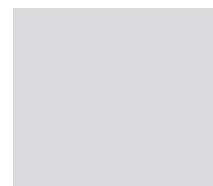
**Goran Cukor**

*napredni obradni sustavi i tehnologije; modeliranje i optimiranje obradnih procesa*  
*advanced manufacturing systems and technology; modelling and optimisation of machining processes*



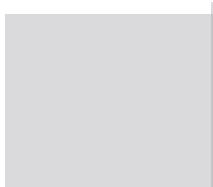
**Milan Ikonić**

*proizvodno strojarstvo; projektiranje proizvodnih sustava; CIM; planiranje i upravljanje proizvodnjom; proizvodni management; projektni management; organizacija i ekonomika poslovnih sustava*  
*production engineering; designing of manufacturing systems; CIM; production planning and control; production management; project management; organization of manufacturing and business systems*



**Tonči Mikac**

*proizvodno strojarstvo; projektiranje proizvodnih sustava; CIM; planiranje i upravljanje proizvodnjom; proizvodni management; projektni management; organizacija i ekonomika poslovnih sustava*  
*production engineering; designing of manufacturing systems; CIM; production planning and control; production management; project management; organization of manufacturing and business systems*



**Duško Pavletić**

*upravljanje kvalitetom; osiguranje i nadzor kvalitete; sustavi kvalitete; zavarivačko inženjerstvo; spajanje materijala; mjeriteljstvo; mjerjenje i kontrola kvalitete*  
*quality management; quality assurance and control; quality systems; welding engineering; joining of materials; metrology; measurements and quality control*



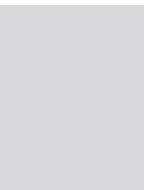


Mladen Perinić

projektiranje tehnoloških procesa; CAM, CAP, CAD/NC-CIM;  
modeliranje, simulacija i optimizacija tehnoloških procesa  
process planning; CAM, CAP, CAD/NC-CIM; modeling,  
simulation and processes plans optimization



**IZVANREDNI PROFESOR | ASSOCIATE PROFESSOR**



Zoran Jurković

alatni strojevi i oprema; CAD/CAM/CAE; dizajn alata i naprava;  
modeliranje, simulacija i optimizacija procesa obrade;  
planiranje eksperimenta  
machine tools & equipment; CAD/CAM/ CAE; design of tools  
and fixtures; modeling, simulation and optimization of machining  
processes; design of experiments



**DOCENTI | ASSISTANT PROFESSORS**



Sven Maričić

projektiranje tehnoloških procesa; CAM, CAP, CAD/NC-CIM; modeliranje,  
simulacija i optimizacija tehnoloških procesa  
process planning; CAM, CAP, CAD/NC-CIM; modeling, simulation and  
processes plans optimization

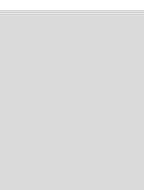


**VIŠI ASISTENTI | SENIOR ASSISTANTS**



Sandro Doboviček

proizvodno strojarstvo; projektiranje proizvodnih sustava; fleksibilni i  
inteligentni sustavi; organizacija proizvodnje; proizvodni management;  
projektni management; CIM  
production engineering; manufacturing system design; flexible and  
intelligent systems; organization of production; project management;  
production management; CIM

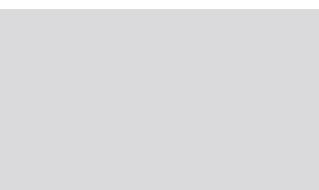


Samir Žic

proizvodno strojarstvo; planiranje i upravljanje proizvodnjom;  
organizacija i ekonomika poslovnih sustava; management i  
organizacijski razvoj  
production engineering; production planning and control;  
organization and economics of business systems; management  
and organizational development



**ASISTENTI | ASSISTANTS**



Maja Forempoher Škuver

upravljanje kvalitetom; osiguranje i nadzor  
kvalitete; mjerjenje i kontrola kvalitete  
quality management; quality assurance and  
control; measurements and quality control





**Graciela Šterpin**

*alatni strojevi i oprema; napredni obradni sustavi i tehnologije  
machine tools and equipment; advanced manufacturing systems and  
technology*

**VANJSKI SURADNICI | ASSOCIATES**

**Marko Fabić**

3. MAJ Brodogradilište d.d., Rijeka | 3. MAJ Shipyard  
JSC, Rijeka

*održavanje  
maintenance*

**Elo Kuljanić**

HAZU

*obrada skidanjem čestica  
machining processes*

**Jasmina Žic**

  
124  
*proizvodno strojarstvo; planiranje i upravljanje  
proizvodnjom; organizacija i ekonomika  
poslovnih sustava; management i organizacijski  
razvoj  
production engineering; production planning  
and control; organization and economics  
of business systems; management and  
organizational development*

**Mauro Štefančić**

Alpron, Jurdani

*mjeriteljstvo  
metrology*

**Toni Vidolin**

3. MAJ Brodogradilište d.d., Rijeka | 3. MAJ Shipyard  
JSC, Rijeka

*tehnologija zavarivanja  
welding technology*

## nastava i znanost education and science

*Nastava iz područja: mjerne tehnike  
i sustava kvalitete, organizacije i  
operacijskog menadžmenta, proizvodne  
tehnologije, proizvodne opreme i robotike,  
projektiranja procesa.*

*Lectures in the field of: measuring  
technique and quality systems,  
organization and operational  
management, manufacturing  
technologies, manufacturing equipments  
and robotics, process planning.*

### KOLEGIJI NA PREDDIPLOMSKIM SVEUČILIŠNIM STUDIJIMA | UNDERGRADUATE UNIVERSITY COURSES

- *Proizvodne tehnologije*
- *Mjerenja i kontrola kvalitete*
- *Osiguranje kvalitete*
- *Inženjerstvo kvalitete*
- *Manufacturing Technologies*
- *Measurements and Quality Control*
- *Quality Assurance*
- *Quality Engineering*

- *Zavarivanje I*
- *Proizvodni strojevi, alati i naprave*
- *Organizacija i ekonomika poslovnih sustava*
- *Planiranje i upravljanje proizvodnjom*
- *Tehnološki procesi*
- *Welding Engineering I*
- *Production Machines, Tools, Jigs and Fixtures*
- *Organization and Economics of Business Entity*
- *Production Planning and Management*
- *Technological Processes*

**KOLEGIJI NA DIPLOMSKIM SVEUČILIŠNIM STUDIJIMA**

| GRADUATE UNIVERSITY COURSES

- *Ljevarstvo*
- *Obrada odvajanjem čestica*
- *Tehnologija oblikovanja*
- *Mjerenje u proizvodnji*
- *Upravljanje kvalitetom*
- *Zavarivanje II*
- *Spajanje materijala*
- *CNC/NC obradni strojevi*
- *Organizacija proizvodnje*
- *Projektiranje proizvodnih sustava*
- *Računalom integrirana proizvodnja*
- *Proizvodni management*
- *Tehnička logistika*
- *Management i organizacijski razvoj*
- *Foundry*
- *Metal Cutting Processes*
- *Metal Forming Technology*
- *Measurement in industry*
- *Quality Management*
- *Welding Engineering II*
- *Joining of materials*
- *CNC/NC Machine Tools*
- *Production Organization*
- *Designing of Production Systems*
- *Computer Integrated Manufacturing*
- *Production Management*
- *Technical Logistics*
- *Management and Organizational Development*
- *Project Management*
- *CAD/CAPP/CAM*
- *Process Planning*
- *Computer Simulation of Production Processes*
- *Maintenance*

**KOLEGIJI NA PREDDIPLOMSKIM STRUČNIM STUDIJIMA**

| UNDERGRADUATE VOCATIONAL COURSES

- *Tehnologija obrade I*
- *Tehnologija obrade II*
- *Mjerna tehnika ST*
- *Osiguranje kvalitete ST*
- *Zavarivanje*
- *Alati i naprave*
- *Obradni strojevi*
- *Organizacija i upravljanje proizvodnjom*
- *Proizvodni sustavi*
- *Organizacija i ekonomika*
- *Tehnološki procesi ST*
- *Manufacturing Technology I*
- *Manufacturing Technology II*
- *Measuring Technique ST*
- *Quality Assurance ST*
- *Welding Engineering*
- *Tools, Jigs and Fixtures*
- *Machine Tools*
- *Production Organization and Management*
- *Production systems*
- *Organization and Economics*
- *Technological Processes ST*

**KOLEGIJI NA POSLIJEDIPLOMSKIM (DOKTORSKIM) SVEUČILIŠNIM STUDIJIMA**

| POSTGRADUATE UNIVERSITY (DOCTORAL) COURSES

- *Deformabilnost i svremeno oblikovanje deformiranjem*
- *Izabrana poglavlja iz nekonvencionalnih postupaka obrade*
- *Izabrana poglavlja iz konvencionalne*
- *Formability and Modern Forming Technology*
- *Selected Chapters on Nonconventional Manufacturing Processes*
- *Selected Chapters on Conventional Metal*



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- obrade odvajanjem čestica
- Upravljanje kvalitetom
- Metode simulacije u proizvodnji
- Planiranje i vođenje proizvodnje
- IP iz fleksibilnih proizvodnih sustava
- Razvojni i proizvodni management
- CAM, CAP, CAD/NC-CIM
- Optimizacija tehnoloških procesa

- Cutting Processes
- Quality Management
- Simulation Methods in Production
- Planning and Processing of Manufacture
- Selected Chapters from flexible production system
- Development and Operational Management
- CAM, CAP, CAD/NC-CIM
- Processes Plans Optimization

## ZNANSTVENOISTRAŽIVAČKI RAD | SCIENTIFIC RESEARCH

- Napredni obradni sustavi i tehnologije, tehnologija oblikovanja deformiranjem, modeliranje i optimiranje obradnih procesa, računalna simulacija proizvodnih procesa  
*Advanced manufacturing systems and technology, forming technology, modelling and optimisation of machining processes, computational simulation of production processes*
- Modeliranje, simulacija i optimizacija procesa obrade. Primjena umjetne inteligencije u upravljanju procesima obrade  
*Modeling, simulation and optimization of manufacturing processes. Application of artificial intelligence in control of manufacturing processes*
- Industrijsko inženjerstvo, upravljanje i osiguranje kvalitete, mjerenja i kontrola kvalitete, mjerjenja u proizvodnji, spajanje materijala, zavarivanje  
*Industrial engineering, quality management, quality assurance, measurements and quality control, industrial measurements, joining of materials, welding*
- Proizvodno strojarstvo; proizvodni sustavi; CIM, planiranje i upravljanje proizvodnjom, proizvodni management, organizacija poslovnih sustava  
*Production engineering, manufacturing systems, CIM, production planning and control, production management, organization of manufacturing and business systems*

## PROJEKTI | PROJECTS

- Razvoj naprednih metoda za modeliranje i optimizaciju obradnih postupaka i sustava, Ministarstvo znanosti, obrazovanja i sporta Republike Hrvatske i Ministarstva obrazovanja, znanosti i sporta Republike Slovenije, Zoran Jurković, 2014-2015, bilateralni Hrvatska – Slovenija znanstvenoistraživački projekt.  
*Development of advanced methods for modeling and optimization of manufacturing processes and systems, Ministry of Science, Education and Sports of the Republic of Croatia and Ministry of Education, Science and Sport of the Republic of Slovenia, Zoran Jurković, 2014-2015, bilateral Croatia-Slovenia research and scientific project.*

## PUBLIKACIJE | PUBLICATIONS

### RADOVI U ČASOPISIMA | JOURNAL PAPERS

- Fabić, M., Pavletić, D., Soković, M., Consideration of Factors in Turnaround Refinery (TAR) Project Management, *International Journal of Advanced Quality*, 2217-8155, 44, 25-40, 2016, Beograd
- Janjić, M., Vukčević, M., Jurković, Z., Šibalić, N., Savićević, S., Physical Modelling and Numerical Finite Element Method (FEM) Simulation of Forging in Open Die of Alloy AlMgSi0,5, *Metalurgija/Metallurgy*, 0543-5846, 55, 181-184, 2016, Zagreb
- Puh, F., Jurković, Z., Perinić, M., Brezočnik, M., Buljan, S., Optimization of Machining Parameters for Turning Operation with Multiple Quality Characteristics using Grey Relational Analysis, doi:



10.17559/TV-20150526131717, Tehnički vjesnik/Technical Gazette, 1330-3651, 23, 377-382, 2016, Slavonski Brod

- Janjić, M., Avdušinović, H., Jurković, Z., Bikić, F., Savićević, S., *Influence of Austempering Heat Treatment on Mechanical and Corrosion Properties of Ductile Iron Samples*, Metalurgija/Metallurgy, 0543-5846, 55, 325-328, 2016, Zagreb
- Luptáková, N., Dymáček, P., Pešlová, F., Jurković, Z., Barborák, O., Stodola, J., *Impact of Residual Elements on Zinc Quality in the Production of Zinc Oxide* Metalurgija/Metallurgy 0543-5846, 55, 407-410, 2016, Zagreb
- Hozdić, E., Jurković, Z., *Cyber Structures for Network Production Systems*, International Journal of Modern Manufacturing Technologies, 2067-3604, VIII, 41-52, 2016, Iasi - Rumunjska
- Mikac, T., Doboviček, S., *Predicting Process Capability Index in Early Stage of Manufacturing Annual 2015 of the Croatian Academy of Engineering*, ISSN 1332-3482, 241-254, 2016, Zagreb

#### MEĐUNARODNI KONGRESI | INTERNATIONAL CONGRESSES

- Žic S., Mikac T., Kos I., Žic J., *Bullwhip effect analysis by simulation experiments in echelon under (R, s, S) inventory policy*, 2nd Logistics International Conference - LOGIC 2015, ISBN 978-86-7395-339-7, 204-209
- Hozdić, E., Jurković, Z., *Semantičke web tehnologije za potporu autonomnim kibernetičkim radnim sistemima*, 3rd International Conference New Technologies – Development and Application – NT 2016, 2303-5668, 168-176
- Hozdić, E., Žapčević, S., Jurković, Z., Butala, P., *Omogućavajuće tehnologije za strukturiranje socijalno-kibernetičko-fizičkih proizvodnih sistema*, 3rd International Conference New Technologies – Development and Application – NT 2016 2303-5668, 177-183
- Klanjac, D., Vidolin, Vučković, Ž., Pavletić, D., *Kvaliteta pripreme i izvedbe zavarenih spojeva* 8. Međunarodno znanstveno-stručno savjetovanje SBZ 2015 Projektiranje, izrada i održavanje zavarenih konstrukcija i proizvoda
- Fabić, M., Pavletić, D., Jurković, Z., *Odrednice modela upravljanja kvalitetom u projektima remonta rafinerijskih postrojenja*, 22. međunarodno savjetovanje HDO



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#### MEĐUNARODNA SURADNJA | INTERNATIONAL COLLABORATIONS

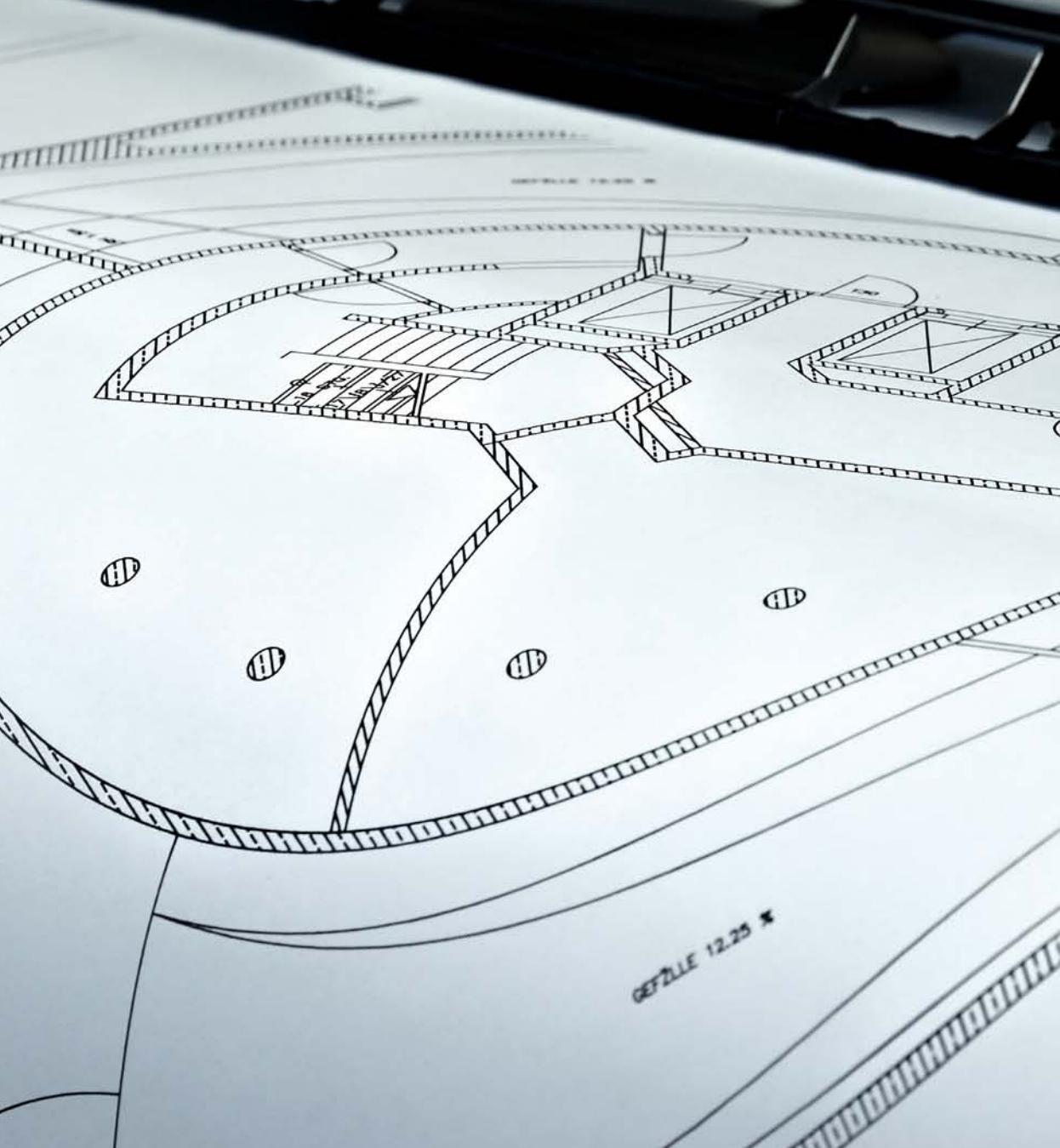
- Università degli Studi di Udine, Facoltà di Ingegneria, Dipartimento di Ingegneria Elettrica, Gestionale e Meccanica (DIEGM), Italija / Italy
- University of Maribor, Faculty of Mechanical Engineering, Production Engineering Institute Slovenia / Slovenia
- University of Kragujevac, Faculty of Engineering, Department for Production Engineering Srbija / Serbia
- University of Novi Sad, Faculty of Technical Sciences, Department of Production Engineering Srbija / Serbia
- University of Montenegro, Faculty of Mechanical Engineering, Podgorica, Crna Gora / Montenegro
- University of Banja Luka, Faculty of Mechanical Engineering, Bosna i Hercegovina / Bosnia & Herzegovina

- *Ss. Cyril and Methodius University in Skopje, Faculty of Mechanical Engineering, Institute of Production Engineering and Management, Republika Makedonija / Republic of Macedonia*
- *Faculty of Mechanical Engineering, University of Zilina, Slovačka / Slovakia*
- *Poznan Politechnic, Technical University of Poznan, Polska / Poland*
- *Technical University of Ostrava, Faculty of Mechanical Engineering, Department of Machining and Assembly, Češka / Czech republic*



**5.**

**zavod za konstruiranje u strojarstvu**  
**department of mechanical engineering**  
**design**





**PREDSTOJNIK ZAVODA | DEPARTMENT HEAD:**

Prof. dr. sc. / Prof. D. Sc. **Neven Lovrin**

<http://www.riteh.uniri.hr/ustroj/zavodi/zks/>

# **djelatnici**

## faculty and staff

**REDOVITI PROFESORI | PROFESSORS**

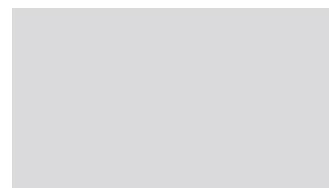


130



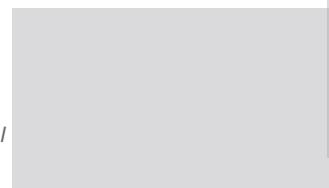
**Božidar Križan**

*konstrukcijski elementi; konstruiranje i oblikovanje proizvoda  
machine elements; systematic product design*



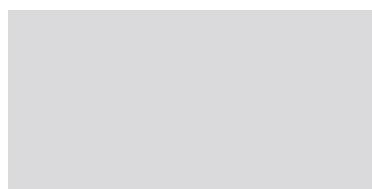
**Neven Lovrin**

*konstrukcijski elementi; mehanički prijenosnici snage;  
transportna sredstva u industriji; brodski palubni strojevi;  
tehnička logistika; inženjerska etika  
machine elements; mechanical power transmissions; industrial  
transport equipment and devices; ship's deck machinery;  
technical logistics; engineering ethics*



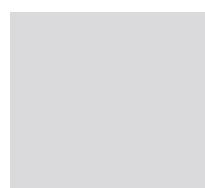
**Gordana Marunić**

*inženjerska grafika; dokumentiranje; tehničko crtanje;  
oblikovanje pomoću računala; inženjerska vizualizacija  
engineering graphics; documenting; technical drawing;  
modelling by computer; engineering visualization*



**Boris Obsieger**

*konstrukcijski elementi; konstrukcijski elementi robota; prijenosnici snage;  
tribologija; metoda rubnih elemenata; numeričke metode u konstruiranju  
machine elements; design elements of robots; power transmission;  
tribology; boundary elements method; numerical methods in mechanical  
engineering design*



**Saša Zelenika**

*precizno inženjerstvo; tehnologija mikrosustava; MEMS i NEMS; sustavi žetve energije; mjerni sustavi; konstrukcijski elementi*  
*precision engineering; microsystems technologies; MEMS and NEMS; energy scavenging devices; measurement systems; machine elements*



**IZVANREDNI PROFESORI | ASSOCIATE PROFESSORS**

**Robert Basan**

*CAE; konstruiranje proizvoda; ponašanje i zarnor materijala, odabir materijala; mehatronika*  
*CAE; systematic product design; behaviour and fatigue of materials; material selection; mechatronics*



**Marina Franulović**

*konstrukcijski elementi; konstruiranje*  
*machine elements; design in mechanical engineering*



**DOCENT | ASSISTANT PROFESSOR**

**Goran Gregov**

*inženjerska grafika; prijenosnici snage; hidraulika i pneumatika; mehatronika*  
*engineering graphics; power transmissions; hydraulics and pneumatics; mechatronics*



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**VIŠI ASISTENTI | SENIOR ASSISTANTS**

**Sanjin Troha**

*inženjerska grafika; dokumentiranje; tehničko crtanje; oblikovanje pomoću računala; konstrukcijski elementi*  
*engineering graphics; documenting; technical drawing; modelling by computer; machine elements*



**Branimir Rončević**

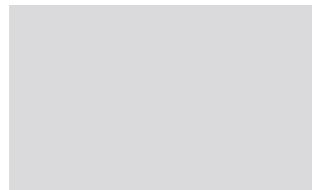
*konstrukcijski elementi; konstrukcijski elementi robota; numeričke metode u konstruiranju*  
*machine elements; design elements of robots; numerical methods in mechanical engineering design*





**Željko Vrcan**

*konstrukcijski elementi; mehanički prijenosnici snage; transportna sredstva u industriji  
machine elements; mechanical power transmissions;  
industrial transport equipment and devices*

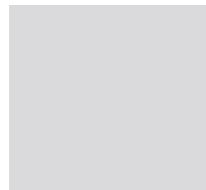


**ZNANSTVENI NOVAK | JUNIOR RESEARCHER**



**Ervin Kamenar**

*precizno inženjerstvo; tehnologija mikrosustava; mehatronika;  
sistemi regulacije i upravljanja; sistemi žetve energije; mjerni sustavi;  
inženjerska grafika i dokumentiranje; oblikovanje pomoći računala  
precision engineering; microsystems technologies; mechatronics;  
control systems; energy scavenging devices; measurement systems;  
engineering graphics and documenting; computer aided design*

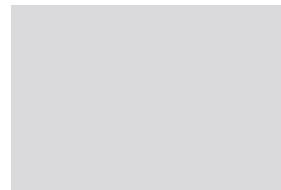


**ASISTENTI | ASSISTANTS**



**David Blažević poslijedoktorand | Postdoctoral Research Assistant**

*konstrukcijski elementi; precizno inženjerstvo  
machine elements; precision engineering*

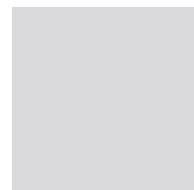


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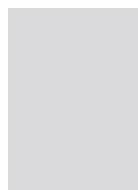
**Kristina Marković poslijedoktorandica | Postdoctoral Research Assistant**

*precizno inženjerstvo; tehnologija mikrosustava; sistemi žetve energije; mjerni  
sistemi; konstrukcijski elementi  
precision engineering; microsystems technologies; energy scavenging  
devices; measurement systems; machine elements*



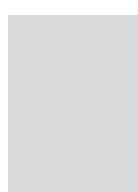
**Marko Perčić**

*inženjerska grafika; dokumentiranje; tehničko crtanje; oblikovanje pomoći  
računala; tehničko dokumentiranje  
engineering graphics; documenting; technical drawing; modelling by computer;  
technical documenting*



**Tea Marohnić**

*inženjerska grafika; dokumentiranje; tehničko crtanje; oblikovanje pomoći  
računala; konstrukcijski elementi  
engineering graphics; documenting; technical drawing; modelling by computer;  
machine elements*



Petar Gljušić

*precizno inženjerstvo; sustavi žetve energije;  
konstrukcijski elementi*  
*precision engineering; energy scavenging devices;  
machine elements*



## nastava i znanost education and science

Nastava se izvodi iz područja: konstruiranje u strojarstvu, numeričke metode u konstruiranju, konstrukcijski elementi, mehanički prijenosnici snage, hidrostatski i pneumatski sustavi prijenosa snage i upravljanja, zupčani prijenosnici, tribologija, transportna sredstva u industriji, brodski palubni strojevi, tehnička logistika, mehatronika, precizno inženjerstvo, tehnologija mikrosustava, MEMS i NEMS, mjerni sustavi, inženjerska grafika i dokumentiranje, oblikovanje pomoću računala, inženjerska vizualizacija, metoda rubnih elemenata.

Cjeloživotno obrazovanje: Oblikovanje 3D modela.

Lectures in the field of: design in mechanical engineering, numerical methods in design, machine elements, mechanical power transmissions, fluid power systems and control, gear transmissions, tribology, industrial transport equipment and devices, ship's deck machinery, technical logistics, mechatronics, precision engineering, microsystems technologies, MEMS and NEMS, measurement systems, engineering graphics and documenting, modelling by computer, engineering visualization, boundary element method.

LLL: 3D modelling

### KOLEGIJI NA PREDDIPLOMSKIM SVEUČILIŠNIM STUDIJIMA

| UNDERGRADUATE UNIVERSITY COURSES

- Inženjerska grafika
- Inženjerska grafika i dokumentiranje
- Izborni projekt - Konstrukcijski elementi I
- Izborni projekt - Konstrukcijski elementi II
- Konstruiranje i oblikovanje
- Konstrukcijski elementi I
- Konstrukcijski elementi II
- Oblikovanje pomoću računala
- Osnove konstruiranja
- Osnove konstrukcijskih elemenata
- Računalne vještine
- Projekt I - Računalne vještine

- Engineering Graphics
- Engineering Graphics and Documenting
- Elective project - Machine Elements Design I
- Elective project - Machine Elements Design II
- Designing and Product Shaping
- Machine Elements Design I
- Machine Elements Design II
- Modelling by Computer
- Fundamentals of Engineering Design
- Fundamentals of Machine Elements Design
- Computer Skills
- Project I - Computer Skills

### KOLEGIJI NA DIPLOMSKIM SVEUČILIŠNIM STUDIJIMA

| GRADUATE UNIVERSITY COURSES

- Brodski palubni strojevi
- Oblikovanje 3D modela
- CAE u razvoju proizvoda

- Ship's Deck Machinery
- 3D modelling
- CAE in Product Development

- Elementi transportne tehnike
- Hidraulika i pneumatika II
- Inženjerska vizualizacija
- Komponente mehatroničkih sustava
- Konstrukcijski elementi III
- Konstrukcijski elementi robota
- Laboratorijske vježbe A
- Laboratorijske vježbe B
- Prijenosnici snage
- Mikro i nano elektromehanički sustavi
- Metodičko konstruiranje
- Modeliranje mehatroničkih sustava
- Numeričke metode u konstruiranju
- Precizne konstrukcije i tehnologija mikro sustava
- Projekt I - Inženjerska vizualizacija
- Projekt I - Konstrukcijski elementi III
- Projekt I - Konstrukcijski elementi robota
- Projekt I - Prijenosnici snage
- Projekt I - Numeričke metode u konstruiranju
- Projekt II - Elektroničke komponente mehatroničkih sustava
- Projekt II – Elementi transportne tehnike
- Projekt II - Hidraulika i pneumatika II
- Projekt II - Precizne konstrukcije i tehnologija mikro sustava
- Tehnička logistika
- Transportni sustavi
- Upravljanje mehatroničkim sustavima
- Mehanika materijala
- Elements of the Transport Technic
- Hydraulics and pneumatics II
- Engineering Visualization
- Components of mechatronic systems
- Machine Elements Design III
- Robot Elements Design
- Laboratory exercises A
- Laboratory exercises B
- Power Transmissions
- Micro and Nano Electromechanical Systems
- Systematic Engineering Design
- Modelling of mechatronic systems
- Numerical Methods in Mechanical Engineering Design
- Precision Engineering and Microsystems Technologies
- Project I - Engineering Visualization
- Project I - Machine Elements Design III
- Project I - Robot Elements Design
- Project I - Mechanical Power Transmissions
- Project I - Numerical Methods in Mechanical Engineering Design
- Project II - Electronic components of mechatronic systems
- Project II – Elements of the Transport Technic
- Project II - Hydraulics and pneumatics II
- Project II - Precision Engineering and Microsystems Technologies
- Technical Logistics
- Transport Systems
- Control of Mechatronics Systems
- Mechanics of Materials



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#### KOLEGIJI NA PREDDIPLOMSKIM STRUČNIM STUDIJIMA

| UNDERGRADUATE VOCATIONAL COURSES

- Elementi strojeva I
- Elementi strojeva I BG
- Elementi strojeva II
- Hidraulika i pneumatika
- Konstruiranje
- Osnove mehatronike
- Tehničko crtanje
- Tehničko dokumentiranje
- Machine Elements I
- Machine Elements I NA
- Machine Elements II
- Hydraulics and pneumatics
- Mechanical Engineering Design
- Fundamentals of Mechatronics
- Technical Drawing
- Technical Documenting

#### KOLEGIJI NA POSLIJEDIPLOMSKIM (DOKTORSKIM) SVEUČILIŠNIM STUDIJIMA

| POSTGRADUATE UNIVERSITY (DOCTORAL) COURSES

- Izabrana poglavlja iz hidrostatskih i pneumatskih prijenosa
- Izabrana poglavlja iz konstrukcijskih elemenata
- Izabrana poglavlja iz prijenosnika snage
- Izabrana poglavlja iz transportnih sredstava u industriji
- Selected Chapters on Hydrostatic and Pneumatic Transmissions
- Selected Chapters on Machine Elements
- Selected Chapters on Power Transmission
- Selected Chapters on Industrial Transport Equipment and Devices

- Kontaktne probleme u analizi konstrukcijskih elemenata
- Modeliranje inženjerskih konstrukcija
- Nauka o konstruiranju
- Podatljivi elementi i mehanizmi
- Principi konstrukcija visokih i ultravisokih preciznosti
- Specijalni mehanički prijenosnici
- Contact Problems in Machine Elements Analyses
- Modelling of Engineering Structures
- Design Science
- Compliant Elements and Mechanisms
- Principles of High and Ultra-High Precision Devices
- Special Mechanical Transmissions

**ZNANSTVENOISTRAŽIVAČKI RAD | SCIENTIFIC RESEARCH**

- Hidraulički hibridni pogoni. Vodeni hidraulički pogoni  
Hydraulic hybrid drives. Water hydraulic systems
- Karakterizacija i numeričko modeliranje ponašanja materijala  
Characterisation and numerical modelling of material behaviour
- Konstrukcijsko strojarstvo  
Mechanical engineering design
- Kontaktne probleme u konstrukcijskim elementima  
Contact problems in machine elements.
- Modeliranje  
Modelling
- Precizno inženjerstvo: podatljivi mehanizmi, pozicioniranje ultravisokih preciznosti i točnosti, strukturalna analiza, integracija u mehatroničke sustave, mjerne tehnike, oprema za sinkrotronsko zračenje  
Precision engineering: compliant mechanisms, ultra-high precision positioning, structural analysis, integration into mechatronics devices, measurement techniques, equipment for synchrotron radiation
- Prijenos energije i informacija u hidrauličkim i pneumatskim sustavima  
The energy and information transmission in hydraulic and pneumatic systems
- Procjena parametara materijala primjenom klasičnih metoda i neuronskih mreža  
Estimation of material properties by means of classical methods and neural networks
- Tehnologija mikrosustava: MEMS, manipulacija, montaža i pakiranje, skalirajući učinci, proizvodnja mikrostruktura, prikupljanje niskorazinske energije iz okoline  
Micro-systems technologies: MEMS, handling, assembly and packaging, scaling effects, micro-fabrication, energy scavenging
- Zamor materijala  
Fatigue of materials
- Zupčasti prijenosnici, planetarni prijenosi, evolventno ozubljenje s velikim stupnjem prekrivanja profila  
Gear transmissions, planetary gears, high transverse contact ratio gears.
- Ponašanje materijala  
Behaviour of materials



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## PROJEKTI | PROJECTS

- Karakterizacija i modeliranje ponašanja materijala za lage i inovativne konstrukcije, MZOS-DAAD, 2014-2015, međunarodni hrvatsko-njemački znanstveni projekt, voditelj Robert Basan  
Characterisation and modelling of material behaviour for lightweight and innovative designs, MZOS-DAAD, 2014-2015, international croatian-german scientific project, Robert Basan
- Karakterizacija i modeliranje ponašanja materijala i konstrukcija za inovativne primjene, Potpore znanstvenim istraživanjima na Sveučilištu u Rijeci, Robert Basan, 2014-2016 Characterization and modelling of materials and structures for innovative applications, Scientific support of University of Rijeka, Robert Basan, 2014-2016
- Razvoj evolucijskih metoda za identifikaciju parametara materijala, Inicijalna potpora za mlađe istraživače Sveučilišta u Rijeci, voditeljica Marina Franulović, 2014-2016  
Development of evolutionary methods for material parameter identification, Initial scientific support of University of Rijeka, Marina Franulović, 2014-2016
- Razvoj evolucijskih postupaka za karakterizaciju ponašanja bioloških tkiva - BIOMAT, Istraživački projekt Hrvatske zaklade za znanost IP-2014-09-4982, voditeljica Marina Franulović, 2015-2019  
Development of evolutionary procedures for characterization of biological tissues behavior - BIOMAT, Scientific project of the Croatian Science Foundation IP-2014-4982, Project leader Marina Franulović, 2015-2019

## PUBLIKACIJE | PUBLICATIONS

### RADOVI U ČASOPISIMA | JOURNAL PAPERS

136



- Milovančević, M., Vračar, Lj., Troha, S., Applicable Importance of Vibro-Diagnostics in Predictable Maintenance of "Naisus" Aqueduct System, *The Journal of Faculty of Technical Sciences - Machine Design*, 1821-1259, 7(3), 97-100, 2015, Novi Sad, Srbija
- Kamenar, E., Zelenika, S., Nanometric positioning accuracy in the presence of presliding and sliding friction: Modelling, identification and compensation, *Mechanics based design of structures and machines*, 1539-7734, 44, 1-17, 2016., Philadelphia (PA, USA)
- Kamenar, E., Zelenika, S., Blažević, D., Maćešić, S., Gregov, G., Marković, K., Glažar, V., Harvesting of river flow energy for wireless sensor network technology, *Microsystem technologies-micro-and nanosystems-information storage and processing systems*, 0946-7076, 22(7), 1557-1574, 2016., Berlin (D)
- Marunić, G., What Blended Learning Provides with Education and Professional World, *Machine Design*, 1821-1259, 7, 41-46, 2015, Novi Sad, Srbija
- Glažar, V., Perčić, M., Marunić, G., Franković, B., A Comparative Study of Evolutionary and Search Algorithms for Optimization of Heat Exchanger with Microchannel Coil, *Special Transactions of FAMENA*, 1333-1124, 40, 75-84, 2016, Zagreb, Hrvatska
- Zelenika, S., Marković, K., Rubeša, J., Issues in the mechanical engineering design of high-precision kinematic couplings, *Engineering Review*, 1330-9587, 36, 303-314, 2016., Rijeka, Hrvatska
- Marković, K., Vrcan, Ž., Influence of Tip Relief Profile Modification on Involute Spur Gear Stress Transactions of FAMENA, 1333-1124, 40(2), 59-70, 2016, Zagreb, Hrvatska
- Marohnić, T., Basan, R., Study of Monotonic Properties' Relevance for Estimation of Cyclic Yield Stress and Ramberg-Osgood Parameters of Steels, *Journal of Materials Engineering and Performance*, 1544-1024, 2016, Ohio, USA

- Rončević, B., Bakić, A., Kodvanj, J., *Numerical and Experimental Analysis of a Frictionless Receding Contact between Cylindrical Indenter, Layer and Substrate*, *Transactions of FAMENA* 1333-1124, Vol 40, No. 2, 1-18, 2016., Zagreb, Hrvatska
- Rončević, B., *Effect of Friction on a Receding Contact between Cylindrical Indenter, Layer and Substrate*, *Machines, Technologies, Materials*, 1313-0226, Issue 8/2016, 3-6, 2016., Sofija, Bugarska
- Rončević, B., *Effect of Friction on a Receding Contact between a Perfect-Fit Pin, Bushing and Plate Machines, Technologies, Materials*, 1313-0227, Issue 9/2016-3-6, 2016., Sofija, Bugarska

**MEĐUNARODNI KONGRESI | INTERNATIONAL CONGRESSES**

- Basan, R., Marohnić, T., *Analysis of cyclic stress-strain and strain-life fatigue parameters and behaviour of high-alloy steels*, *15th International Conference on New Trends in Fatigue and Fracture (Book of Abstracts)*, 978-953-7738-39-6, 191-192, 2016., Zagreb, Hrvatska
- Franulović, M., Basan, R., Marković, K., Marohnić, T., *Biomaterials characterization – parameters identification*, *16th International Conference on New Trends in Fatigue and Fracture (Book of Abstracts)*, 978-953-7738-39-6, 107-108, 2016., Zagreb, Hrvatska
- Troha, S., Karaivanov, D., Džindo, E., *Two-Speed Two-Carrier Planetary Gear Trains*, *Proceedings of TEAM 2015*, 978-86-7083-877-2, 538-542, 2015, Beograd, Srbija
- Stefanović-Marinović, J., Troha, S., Milovančević, M., *Efficiency as an Expression of Planetary gear Train Energy Losses*, *The 9th International Symposium KOD 2016*, 978-86-7892-821-5, 63-66 2016, Balantofuered, Mađarska
- Troha, S., Karaivanov, D., Stefanović Marinović, J., *Investigation into Two-Speed Two-Carrier Planetary Gearboxes*, *The 10th International Conference Advanced Manufacturing Technologies, AMT 2016*, 2016, Sozopol, Bugarska
- Stefanović-Marinović, J., Troha, S., Milovančević, M., *Planetary Gear Transmission Power Losses as the Cause of Heating*, *The 10th International Conference Advanced Manufacturing Technologies, AMT 2016*, 2016, Sozopol, Bugarska
- Kamenar, E., Zelenika, S., *Validation of pre-sliding friction models for ultra-high precision applications*, *Proceedings of the 16th EUSPEN International Conference*, 978-0-9566790-8-6, 167-168, 2016., Cranfield, UK
- Kamenar, E., Zelenika, S., *Compensation of frictional disturbances in ultra-high precision mechatronics devices*, *Proceedings of the 16th EUSPEN International Conference*, 978-0-9566790-8-6, 175-176, 2016., Cranfield, UK
- Zelenika, S., Kamenar, E., *Modelling and identification of pre-sliding and sliding friction in ultra-high precision positioning systems*, *Proceedings of the 16th EUSPEN International Conference*, 978-0-9566790-8-6, 187-187, 2016., Cranfield, UK
- Katić, V., Zelenika, S., Kamenar, E., Marković, K., Perčić, M., Špalj, S., *Mechanical testing of orthodontic archwires*, *Proceedings of the 16th EUSPEN International Conference*, 978-0-9566790-8-6, 339-340, 2016., Cranfield, UK
- Katić, V., Kamenar, E., Zelenika, S., Marković, K., Špalj, S., *Effect of the pH of Artificial Saliva on Mechanical Properties of Orthodontic Archwires*, *IV International Conference on Biodental Engineering*, 2016., Porto, PT
- Franulović, M., Basan, R., Marković, K., *Material behavior simulation of 42CrMo4 steel*, *Proceedings of the 6th International Conference on Simulation and Modeling Methodologies, Technologies and Applications*, 2016, Lisbon, Portugal



**POZVANA PREDAVANJA | INVITED LECTURES**

- Basan, R., MATDAT - From online materials database to collaborative web platform for increasing availability and citability of published materials research and promoting laboratories and research capabilities, International Conference on Materials, Tribology, Recycling, MATRIB 2016, Vela Luka, Hrvatska
- Basan, R., Metode procjene cikličkih i zamornih parametara materijala – pregled, evaluacija i odabir, Seminar Zamor i lom konstrukcija, Fakultet strojarstva i brodogradnje, 2016., Zagreb, Hrvatska

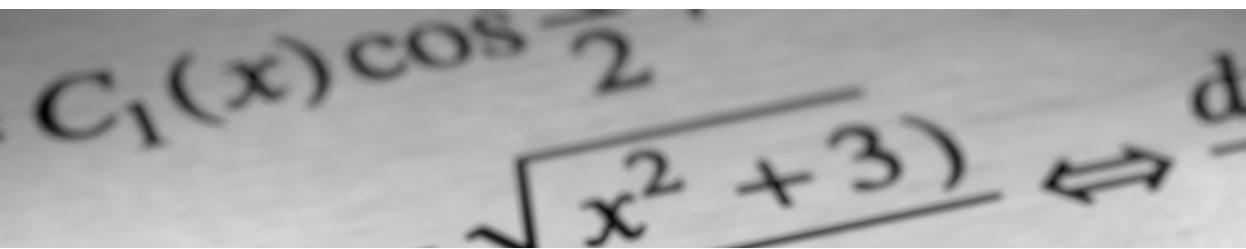
**MEĐUNARODNA SURADNJA | INTERNATIONAL COLLABORATIONS**

- Elettra, Italija, Italy
- Faculty of Industrial Technology, Technical University - Sofia, Bugarska / Bulgaria
- Faculty of Mechanical Engineering, Technical University - Sofia, Bugarska / Bulgaria
- Fakultet strojarstva i brodogradnje, Sveučilište u Zagrebu, Hrvatska / Croatia
- Fakulteta za strojništvo, Univerza v Ljubljani, Slovenija / Slovenia
- Fakulteta za strojništvo, Univerza v Mariboru, Slovenija / Slovenia
- Mašinski fakultet, Univerzitet u Nišu, Srbija / Serbia
- University of Applied Sciences, Graz, Austrija / Austria
- University of Chemical Technology and Metallurgy, Bugarska / Bulgaria
- University of Udine, Italija / Italy
- Moscow State Industrial University, Rusija / Russia
- Institut für Stahlbau und Werkstoffmechanik, Technische Universität Darmstadt, Njemačka / Germany



5<sup>6</sup>

**zavod za matematiku, fiziku,  
strane jezike i kineziologiju  
department of mathematics, physics,  
foreign languages and kinesiology**



**PREDSTOJNIK ZAVODA | DEPARTMENT HEAD:**

Prof. dr. sc. / Prof. D. Sc. **Senka Maćešić**

<http://www.riteh.uniri.hr/ustroj/zavodi/zmfsjk/>

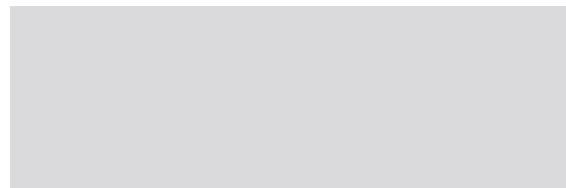
## **djelatnici** faculty and staff

**REDOVITI PROFESORI | PROFESSORS**



**Julijan Dobrinić**

*fizika; zaštita okoliša  
physics; environmental protection*

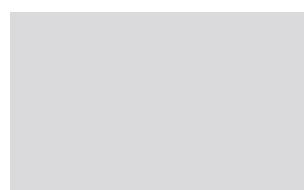


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**Senka Maćešić**

*numerička matematika; znanstveno računanje; matematičko modeliranje; optimalno upravljanje  
numerical mathematics; scientific computing; mathematical modelling; optimal control*

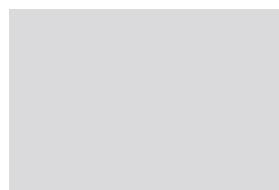


**IZVANREDNI PROFESORI | ASSOCIATE PROFESSORS**

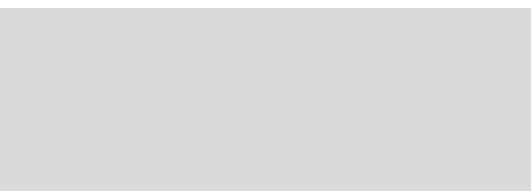


**Nelida Črnjarić-Žic**

*numerička matematika; znanstveno računanje; računalne simulacije u tehniči; matematičko modeliranje; analiza podataka  
numerical mathematics; scientific computing; computer simulations in engineering; mathematical modelling; data analysis*



VIŠI PREDAVAČI | SENIOR LECTURERS



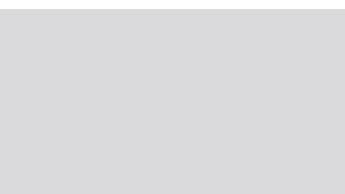
Mirko Bađim

kineziologija  
kinesiology



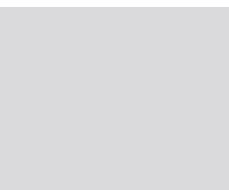
Elisa Velčić-Janjetić

njemački jezik i književnost; engleski jezik i književnost;  
jezik struke  
german language and literature; english language and  
literature; professional language



Katica Jurasić

euklidska i neeuklidska geometrija;  
metodika nastave matematike  
euclidean and noneuclidean geometry;  
mathematics education

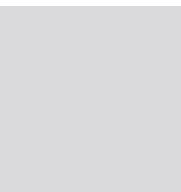


Ksenija Mance

engleski jezik i književnost; njemački jezik i književnost;  
jezik struke  
english language and literature; german language and  
literature; professional language

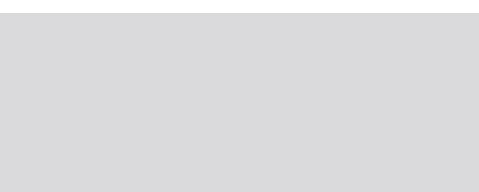


PREDAVAČI | LECTURERS



Ivan Dražić

parcijalne diferencijalne jednadžbe; mikropolarni fluidi;  
numerička analiza; statistička obrada podataka; metodika  
nastave matematike  
partial differential equations; micropolar fluids; numerical  
analysis; statistical analysis; methodology of teaching  
mathematics



Melita Štefan-Trubić

numerička matematika  
numerical mathematics

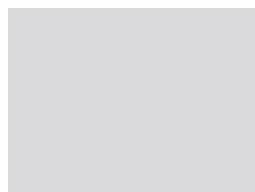


**VIŠI ASISTENTI** | SENIOR ASSISTANTS



**Loredana Simčić**

*kombinatorna i diskretna matematika; mikropolarni fluidi  
combinatorial and discrete mathematics; micropolar fluids*



**VANJSKI SURADNICI** | ASSOCIATES

**Vanja Čotić**  
**Dejan Dešković**  
**Ana Grbac**  
**Igor Lulić**  
**Ivan Tudor**  
**Sanja Vranić**

*matematika  
mathematics*

**Marta Žuvić - Butorac**  
**Nataša Glavan - Vukelić**  
**Zdravko Lenac**  
**Darko Mekterović**  
**Boris Mifka**  
**Marijana Varošanec**

*fizika  
physics*

**Bojan Crnković**

*numerička matematika; matematičko modeliranje;  
računalne simulacije u tehniči  
numerical mathematics, mathematical modelling,  
computer simulations in engineering*

## nastava i znanost education and science

*Nastava matematičkih kolegija izvodi se za inženjere s odabranim poglavljima iz područja linearne algebre, matematičke analize, diferencijalnih jednadžbi, vjerojatnosti i statistike te numeričke i stohastičke matematike. Nastava fizikalnih kolegija izvodi se za inženjere s odabranim poglavljima iz moderne fizike i zaštite okoliša. Nastava engleskog i njemačkog jezika obuhvaća obradivanje odabranih poglavljja iz područja strojarstva, brodogradnje, elektrotehnike i računarstva te usavršavanje stručnog vokabulara i gramatičkih struktura jezika tehnike. Nastava iz tjelesne i zdravstvene kulture odvija se kroz obvezne programe (atletika, nogomet, košarka, odborka, rukomet, vaterpolo sa plivanjem i fitness) kao i slobodne programe (skijanje, jedrenje, veslanje, planinarenje i rafting).*

*Mathematical lectures for engineers with selected chapters in the fields of: linear algebra, mathematical analysis, differential equations, probability and statistics, numerical and stochastic mathematics. Physics lectures for engineers with selected chapters in modern physics and environment protection. The English and German Language courses of study cover the analysis of selected chapters in the field of Mechanical Engineering, Naval Architecture, Electrical Engineering and Computer Engineering as well as the enhancement of professional-technical vocabulary and grammar. Lectures in physical and health education is realized through both compulsory programs (athletics, football, basketball, volleyball, handball, waterpolo with swimming and fitness program) and optional programs (skiing, sailing, rowing, mountaineering and rafting).*

## KOLEGIJI NA PREDDIPLOMSKIM SVEUČILIŠNIM STUDIJIMA

| UNDERGRADUATE UNIVERSITY COURSES

- Matematika 1
- Matematika 2
- Inženjerska matematika ET
- Inženjerska matematika R
- Inženjerska statistika
- Uvod u modernu fiziku
- Fizika 1
- Fizika 2
- Zaštita okoliša
- Engleski jezik I
- Engleski jezik II
- Njemački jezik I
- Njemački jezik II
- Tjelesna i zdravstvena kultura I
- Tjelesna i zdravstvena kultura II
- Mathematics 1
- Mathematics 2
- Engineering mathematics ET
- Engineering mathematics R
- Statistics for engineers
- Introduction to modern physics
- Physics 1
- Physics 2
- Environment protection
- English Language I
- English Language II
- German Language I
- German Language II
- Physical and Health Education I
- Physical and Health Education II

## KOLEGIJI NA DIPLOMSKIM SVEUČILIŠNIM STUDIJIMA

| GRADUATE UNIVERSITY COURSES

- Inženjerska matematika
- Numerička i stohastička matematika
- Stohastička matematika
- Engineering mathematics
- Numerical and stochastic mathematics
- Stochastic mathematics

## KOLEGIJI NA PREDDIPLOMSKIM STRUČNIM STUDIJIMA

| UNDERGRADUATE VOCATIONAL COURSES

- Matematika 1
- Matematika 2
- Fizika
- Engleski jezik I
- Engleski jezik II
- Njemački jezik I
- Njemački jezik II
- Tjelesna i zdravstvena kultura I
- Tjelesna i zdravstvena kultura II
- Mathematics 1
- Mathematics 2
- Physics
- English Language I
- English Language II
- German Language I
- German Language II
- Physical and Health Education I
- Physical and Health Education II



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## KOLEGIJI NA POSLIJEDIPLOMSKIM (DOKTORSKIM) SVEUČILIŠNIM STUDIJIMA

| POSTGRADUATE UNIVERSITY (DOCTORAL) COURSES

- Statističke metode i stohastički procesi
- Matematičko modeliranje i numeričke metode
- Metode optimizacije
- Metodologija znanstvenoistraživačkog rada
- Izabrana poglavlja iz zaštite okoliša
- Instrumentacija i analitičke tehnike u zaštiti okoliša
- Kemija okoliša
- Zaštita mora i priobalja
- Statistical Methods and Stochastic Processes
- Mathematical Modeling and Numerical Methods
- Optimization Methods
- Methodology of Scientific Work and Research
- Selected Topics on Environment Protection
- Instrumentation and Analytical Techniques in Environment Protection
- Environmental Chemistry
- Protection of Sea and Coastal Zone

**ZNANSTVENOISTRAŽIVAČKI RAD | SCIENTIFIC RESEARCH**

- *parcijalne diferencijalne jednadžbe, numerička matematika, matematičko modeliranje, optimizacija, operacijska istraživanja, statističke metode, diferencijalna geometrija, kombinatorna i diskretna matematika*  
*partial differential equations, numerical mathematics, mathematical modeling, optimization, operational research, statistical methods, differential geometry, combinatorial and discrete mathematics*
- *zaštita okoliša, atomska i nuklearna fizika*  
*environment protection, atomic and nuclear physics*
- *interdisciplinarno znanstvenoistraživački pristup području antropologije i temama kulture (znanstvena grana anglistika, područje lingvistike); istraživanje pojma tehnike uopće kao i njegove prisutnosti u izabranim romanima njemačke književnosti weimarskog doba (1918.-1933.) (znanstvena grana germanistika, područje književnosti)*  
*interdisciplinary scientific-research approach to the field of anthropology and cultural themes (the scientific branch of English studies, field Linguistics; research of the term technics and its presence in selected novels of the German literature of the Weimar period (1918-1933) (the scientific branch German studies, field Literature)*

**PROJEKTI | PROJECTS**

- *Matematičko i numeričko modeliranje kompresibilnog mikropolarnog fluida, istraživanje uz potporu Sveučilišta, voditelj Nermina Mujaković, suradnici Ivan Dražić, Nelida Črnjarić-Žic, Senka Mačešić i Loredana Simčić*  
Mathematical and numerical modeling of compressible micropolar fluid, research supported by the University, principal investigator Nermina Mujaković, collaborators Ivan Dražić, Nelida Črnjarić-Žic, Senka Mačešić and Loredana Simčić
- *Ekološko modeliranje u obalnom području Riječkog zaljeva, istraživanje uz potporu Sveučilišta, voditelj Lado Kranjčević, suradnice Nelida Črnjarić-Žic i Senka Mačešić*  
Ecological modeling in the Bay of Rijeka coastal area, research supported by the University, principal investigator Lado Kranjčević, collaborators Nelida Črnjarić-Žic and Senka Mačešić
- *Karakterizacija i modeliranje ponašanja materijala i konstrukcija za inovativne primjene, istraživanje uz potporu Sveučilišta, voditelj Robert Basan, suradnica Nelida Črnjarić-Žic*  
Characterization and modeling of materials and constructions behavior for innovative applications, research supported by the University, principal investigator Robert Basan, collaborator Nelida Črnjarić-Žic
- *Reciklajući endosomalni putevi, istraživanje uz potporu Sveučilišta, voditeljica Gordana Blagojević-Zagorac, suradnik Senka Mačešić*  
Recycling endosomal paths, research supported by the University, principal investigator Gordana Blagojević-Zagorac, collaborator Senka Mačešić
- *TRACESS - prijenos i kemodinamika elemenata u tragovima u vodi i obalnom sedimentnom sustavu*  
TRACESS - Transport and chemodynamics of trace elements in freshwater and coastal sedimentary systems



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**PUBLIKACIJE** | PUBLICATIONS**RADOVI U ČASOPISIMA** | JOURNAL PAPERS

- Dražić, I., Mujaković, N., Simčić, L., *3-D flow of a compressible viscous micropolar fluid with spherical symmetry: regularity of the solution*, *Journal of mathematical analysis and applications*, 0022-247X, 438, 162-183, 2016
- Dražić, I., Mujaković, N., *Some properties of a generalized solution for 3-D flow of a compressible viscous micropolar fluid model with spherical symmetry*, *Differential and Difference Equations with Applications - Springer Proceedings in Mathematics & Statistics*, Pinelas, S. et al. eds, 978-3-319-32855-3, 197-205, 2016, Springer, Heidelberg
- Mujaković, N., Črnjarić-Žic N., *Finite Difference Formulation for the Model of a Compressible Viscous and Heat-Conducting Micropolar Fluid with Spherical Symmetry*, *Differential and Difference Equations with Applications - Springer Proceedings in Mathematics & Statistics*, Pinelas, S. et al. eds, 978-3-319-32855-3, 275-283, 2016, Springer, Heidelberg
- Črnjarić-Žic N., Mujaković, N., *Numerical analysis of the solutions for 1d compressible viscous micropolar fluid flow with different boundary conditions*. *Mathematics and computers in simulation*, 0378-4754, 126, 45-62, 2016
- Črnjarić-Žic N., *Upwind numerical approximations of a compressible 1d micropolar fluid flow*. *Journal of computational and applied mathematics*, 0377-0427, 303, 81-92, 2016
- Kamenar, E., Zelenika, S., Blažević, D., Maćešić, S., Gregov, G., Marković, K., Glažar, V., *Harvesting of river flow energy for wireless sensor network technology*, *Mycrosystems Technologies*, 0946-7076, 22, 1557-1574, 2016
- Mahmutfendić, H., Blagojević Zagorac, G., Grabušić, K., Karleuša, Lj., Maćešić, S., Momburg, F., Lučin, P., *Late Endosomal Recycling of Open MHCI Conformers*, *Journal of Cellular Physiology*, 1097-4652, 9999, doi 10.1002/jcp.25495, 2016, Wiley Periodicals, Inc.
- Blagojević Zagorac, G., Mahmutfendić, H., Maćešić, S., Karleuša, Lj., Lučin, P., *Quantitative Analysis of Endocytic Recycling of Membrane Proteins by Monoclonal Antibody Based Recycling Assays*, *Journal of Cellular Physiology*, 1097-4652, 9999, doi 10.1002/jcp.25503, 2016, Wiley Periodicals, Inc.

**MEĐUNARODNI KONGRESI** | INTERNATIONAL CONGRESSES

- Dražić, I., Mujaković, N., *3-D flow of a compressible viscous micropolar fluid with cylindrical symmetry: a local existence theorem*, *Equadiff 2015*, 2015, Lyon, Francuska
- Dražić, I., *3-D flow of a compressible viscous micropolar fluid with spherical symmetry: exponential stability of the solution*, *4th Najman Conference On Spectral Problems For Operators And Matrices*, 2015, Opatija, Hrvatska
- Dika, A., Dražić, I., *e-Classroom - Extra Curricular, Excellence & Innovation in Basic-Higher Education & Psychology*, 2016, Rijeka, Hrvatska
- Dražić, I., *Global existence theorem for 3-D flow of a compressible viscous micropolar fluid with cylindrical symmetry*, *6th Croatian Mathematical Congress*, 2016, Zagreb, Hrvatska
- Dražić, I., Črnjarić-Žic, N., Mujaković, N., *Numerical approximation of the solution for 3D compressible viscous micropolar fluid model with cylindrical symmetry*, *7th European Congress of Mathematics*, 2016, Berlin, Njemačka



- Simčić, L., Mujaković, N., Dražić, I., *3-D flow of a compressible viscous micropolar fluid with cylindrical symmetry: uniqueness of the solution*, 6th Croatian Mathematical Congress, 2016, Zagreb, Hrvatska
- Simčić, L., Mujaković, N., Dražić, I., *Hölder continuous solution for spherically symmetric 3-D model of a compressible viscous micropolar fluid*, 7th European Congress of Mathematics, 2016 Berlin, Njemačka
- Črnjarić-Žic N., Mujaković N., *Convergent finite difference scheme for a compressible micropolar fluid flow with a free boundary*, 6th Croatian Mathematical Congress, 2016, Zagreb, Hrvatska
- Štefan Trubić M., Radošević I., *Prezentacijski alati za prikaz matematičkih sadržaja*, 39. međunarodni skup za informacijsku i komunikacijsku tehnologiju, elektroniku i mikroelektroniku, 2016, Opatija, Hrvatska

#### MEĐUNARODNA SURADNJA | INTERNATIONAL COLLABORATIONS

- University of California, Santa Barbara, SAD / USA
- Paul Scherrer Institut, Švicarska / Switzerland



5.<sup>7</sup>

**zavod za materijale**  
**department of materials science and**  
**engineering**





**PREDSTOJNIK ZAVODA | DEPARTMENT HEAD:**

Prof. dr. sc. / Prof. D. Sc. Božo Smoljan

<http://www.riteh.uniri.hr/ustroj/zavodi/zm/>

# djelatnici

## faculty and staff

**REDOVITI PROFESORI | PROFESSORS**



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**Loreta Pomenić**

*materijali; tehnologija materijala; materijali i tehnološki postupci; nemetalni materijali; zaštita materijala; karakterizacija materijala; selekcija materijala; kemijska materijala; korozija i zaštita metala*  
*materials; technology of material; materials and technological processes; nonmetal materials; materials protection; materials characterisation; materials selection; materials chemistry; corrosion and metals protection*



**Domagoj Rubeša**

*mehanika materijala; mehanika prijeloma i umorljivost; selekcija materijala; procesi oštećivanja materijala*  
*materials mechanics; fracture mechanics and fatigue of materials; materials selection; processes of damaging of materials*



**Božo Smoljan**

*materijali; tehnologija materijala; materijali i tehnološki postupci; metalni materijali; ljevarstvo; karakterizacija materijala; toplinska obrada i inženjerstvo površina; ispitivanje materijala*  
*materials; technology of material; materials and technological processes; metallic materials; casting; materials characterisation; heat treatment and surface engineering; materials testing*

**DOCENT | ASSISTANT PROFESSOR**



**Dario Ilijkić**

*materijali; tehnologija materijala; materijali i tehnološki postupci; postupci toplinske obrade; metalni materijali; ljevarstvo; ispitivanje materijala*  
*materials; technology of material; materials and technological processes; processes of heat treatment; metallic materials; casting; materials testing*

**ASISTENTI | ASSISTANTS****Lovro Štic**

*termalni procesi materijala  
thermal processes of materials*

**VANJSKI SURADNICI | ASSOCIATES****Sunčana Smokvina Hanza**

Adriainspekt d.o.o.

*materijali; tehnologija materijala; materijali i tehnološki postupci; metalni materijali; ispitivanje materijala  
materials; technology of material; materials and technological processes; metallic materials; materials testing*

**Neven Tomašić**

Hara d.o.o.

*materijali; tehnologija materijala; materijali i tehnološki postupci; postupci toplinske obrade; metalni materijali  
materials; technology of material; materials and technological processes; processes of heat treatment; metallic materials*

**Leszek Adam**

Silesian University of Technology, Gliwice

*materijali; tehnologija materijala; materijali i tehnološki postupci; metalni materijali; nemetalni materijali; zaštita materijala; ljevarstvo; karakterizacija materijala; mehanika materijala; toplinska obrada i inženjerstvo površina; mehanika prijeloma i umorljivost; ispitivanje materijala; selekcija materijala; procesi oštećivanja materijala; kemijska materijala; korozija i zaštita metala  
materials; technology of material; materials and technological processes; metallic materials; nonmetal materials; materials protection; casting; materials characterisation; materials mechanics; heat treatment and surface engineering; fracture mechanics and fatigue of materials; materials testing; materials selection; processes of damaging of materials; materials chemistry; corrosion and metals protection*

**Vojteh Leskovšek**

IMT Ljubljana

*karakterizacija materijala; toplinska obrada i inženjerstvo površina; mehanika prijeloma i umorljivost  
materials characterisation; heat treatment and surface engineering; fracture mechanics and fatigue of materials*

**Robert Danzer**

Institut für Struktur- und Funktionskeramik

*keramički i kompozitni materijali  
ceramics and composite materials*



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## nastava i znanost education and science

Nastava se izvodi iz područja materijala, tehnologije materijala, materijala i tehnoloških postupaka, karakterizacije materijala, metalnih materijala, nemetalnih materijala, zaštite materijala, ljevarstva, mehanike materijala, toplinske obrade i inženjerstva površine, mehanike prijeloma i umorljivosti, ispitivanja materijala, selekcije materijala, procesa oštećivanja materijala, kemije materijala, korozije i zaštite metala.

Lectures in the field of materials, technology of material, materials and technological processes, materials characterisation, metallic materials, nonmetal materials, materials protection, casting, materials mechanics, heat treatment and surface engineering, fracture mechanics and fatigue of materials, materials testing, materials selection, processes of damaging of materials, materials chemistry, corrosion and metals protection.

## KOLEGIJI NA PREDDIPLOMSKIM SVEUČILIŠNIM STUDIJIMA

| UNDERGRADUATE UNIVERSITY COURSES

- Materijali I
- Materijali II
- Tehnologija materijala
- Izborni projekt - Materijali I
- Izborni projekt - Materijali II
- Karakterizacija materijala
- Postupci toplinske obrade
- Materials I
- Materials II
- Technology of Material
- Elective project - Materials I
- Elective project - Materials II
- Materials Characterisation
- Processes of Heat Treatment

## KOLEGIJI NA DIPLOMSKIM SVEUČILIŠNIM STUDIJIMA

| GRADUATE UNIVERSITY COURSES

- Metalni materijali
- Nemetalni materijali
- Zaštita materijala
- Projekt I - Zaštita materijala
- Projekt I - Metalni materijali
- Mehanika materijala
- Toplinska obrada metala i inženjerstvo površina
- Projekt II - Mehanika materijala
- Projekt II - Toplinska obrada metala i inženjerstvo površina
- Mehanika prijeloma
- Ispitivanje materijala
- Selekција materijala
- Metallic Materials
- Nonmetallic Materials
- Materials Protection
- Project I - Materials Protection
- Project I - Metallic Materials
- Materials Mechanics
- Metals Heat Treatment and Surface Engineering
- Project II - Materials Mechanics
- Project II - Metals Heat Treatment and Surface Engineering
- Fracture Mechanics
- Materials Testing
- Materials Selection

## KOLEGIJI NA PREDDIPLOMSKIM STRUČNIM STUDIJIMA

150

| UNDERGRADUATE VOCATIONAL COURSES

- Materijali
- Materijali i tehnološki postupci
- Materials
- Materials and Technological Processes

## KOLEGIJI NA POSLIJEDIPLOMSKIM (DOKTORSKIM) SVEUČILIŠNIM STUDIJIMA

| POSTGRADUATE UNIVERSITY (DOCTORAL) COURSES

- Procesi oštećivanja materijala
- Mehanika prijeloma i umorljivost materijala
- Kemija materijala
- Korozija i zaštita materijala
- Toplinska obrada i inženjerstvo površina
- Izabrana poglavља iz ispitivanja materijala
- Processes of Damaging of Materials
- Fracture Mechanics and Fatigue of Materials
- Materials Chemistry
- Corrosion and Metals Protection
- Heat Treatment and Surface Engineering
- Selected Chapters on Material Testing

## ZNANSTVENOISTRAŽIVAČKI RAD | SCIENTIFIC RESEARCH

- Znanstvenoistraživački rad iz znanstvenog područja tehničke znanosti, znanstvenih polja strojarstvo i temeljne tehničke znanosti, znanstvenih grana proizvodno strojarstvo i materijali. Research and development activities in the scientific area of Technical Sciences, scientific fields of Mechanical Engineering and Fundamental Engineering Sciences, scientific branches of Mechanical Production Engineering and Materials

**PROJEKTI** | PROJECTS

- *Optimiranje i modeliranje termalnih procesa materijala, HRZZ - Hrvatska zaklada za znanost, Božo Smoljan, 2014 - 2018, znanstvenoistraživački.*  
*Optimisation and modelling of thermal processes of materials, HRZZ - Croatian science foundation, Božo Smoljan, 2014 - 2018, research and scientific project.*
- *Računalno optimiranje parametara termalnih procesa obrade metala, Sveučilište u Rijeci, Božo Smoljan, 2013 - 2015, znanstvenoistraživački.*  
*Computer optimization of parameters of thermal processes of metals, University of Rijeka, Božo Smoljan, 2013 - 2015, research and scientific.*

**PUBLIKACIJE** | PUBLICATIONS**KNJIGE** | BOOKS

- *Smoljan B., Encyclopedia of Iron, Steel, and Their Alloys (ch. "Quench Processing: Multiple", pp. 2683-2705), CRC Press, Taylor & Francis Group, 9781466511040, 2015., New York, SAD  
 Prvo izdanje (poglavlje u knjizi)*

**RADOVI U ČASOPISIMA** | JOURNAL PAPERS

- *Smoljan, B., Ilijkić, D., Totten, G. E., Mathematical Modeling and Simulation of Hardness of Quenched and Tempered Steel, Metallurgical and Materials Transactions B, 1073-5615, 46 (6) 2666-2673, 2015., SAD*

**MEĐUNARODNI KONGRESI** | INTERNATIONAL CONGRESSES

- *Smoljan B., Ilijkić D., Rubeša D., Štic L., Maretić M., Mathematical Modelling and Computer Simulation of Steel Quenching, "Proceedings of The Ninth Pacific Rim International Conference on Advanced Materials and Processing (PRICM9)", 2016., Kyoto, Japan*
- *Smoljan, B., Ilijkić, D., Štic, L., Computer modelling of quenching of steel die for industrial purpose, Proceedings of the International Conference HIGH TECH DIE CASTING 2016, 2016. Venecija, Italija*
- *Smoljan, B., Ilijkić, D., Štic, L., Tomašić, N., Smokvina Hanza, S., Mathematical modelling of mechanical properties and microstructure of welded joint, Proceedings of the 41st International Conference WELDING 2016, Modern Joining Processes, Development of Filler Materials and Simulations, 2016., Opatija, Hrvatska*
- *Smoljan, B., Ilijkić, D., Štic, L., Kolumbić, Z., Mathematical modelling of steel quenching, Proceedings of the International Conference on PROCESSING & MANUFACTURING OF ADVANCED MATERIALS, Processing, Fabrication, Properties, Applications, THERMEC'2016, 2016., Graz, Austrija*
- *Smoljan, B., Ilijkić, D., Štic, L., Smokvina Hanza, S., Numerical modelling of steel quenching Proceedings of the European Conference on Heat Treatment 2016, 3rd International Conference on Heat Treatment and Surface Engineering in Automotive Applications, 2016. Prag, Česka*
- *Smoljan, B., Ilijkić, D., Štic, L., Mathematical Modeling and Computer Simulation of Non-monotonic Quenching, Proceedings of the 23rd IFHTSE Congress, 2016., Savannah, SAD*
- *Smoljan, B., Ilijkić, D., Salopek, G., Prediction of Load Capacity of Quenched and Tempered Steel Specimen Proceedings of the International Conference on Advances in Materials and Processing Technologies, AMPT 2015, 2015., Madrid, Španjolska*



- Smoljan, B., Ijkić, D., Štic, L., Rubeša, D., Matematičko modeliranje i računalna simulacija tvrdoće nakon poboljšanja Proceedings of the 5th International conference on Mechanical Technologies and Structural Materials 2015, 2015., Split, Hrvatska
- Smoljan, B., Ijkić, D., Tomašić, N., Prediction of Mechanical Properties and Microstructure Composition of Quenched and Tempered Steel, Proceedings of the 28th ASM Heat Treating Society Conference "Heat Treat 2015", 2015., Detroit, SAD

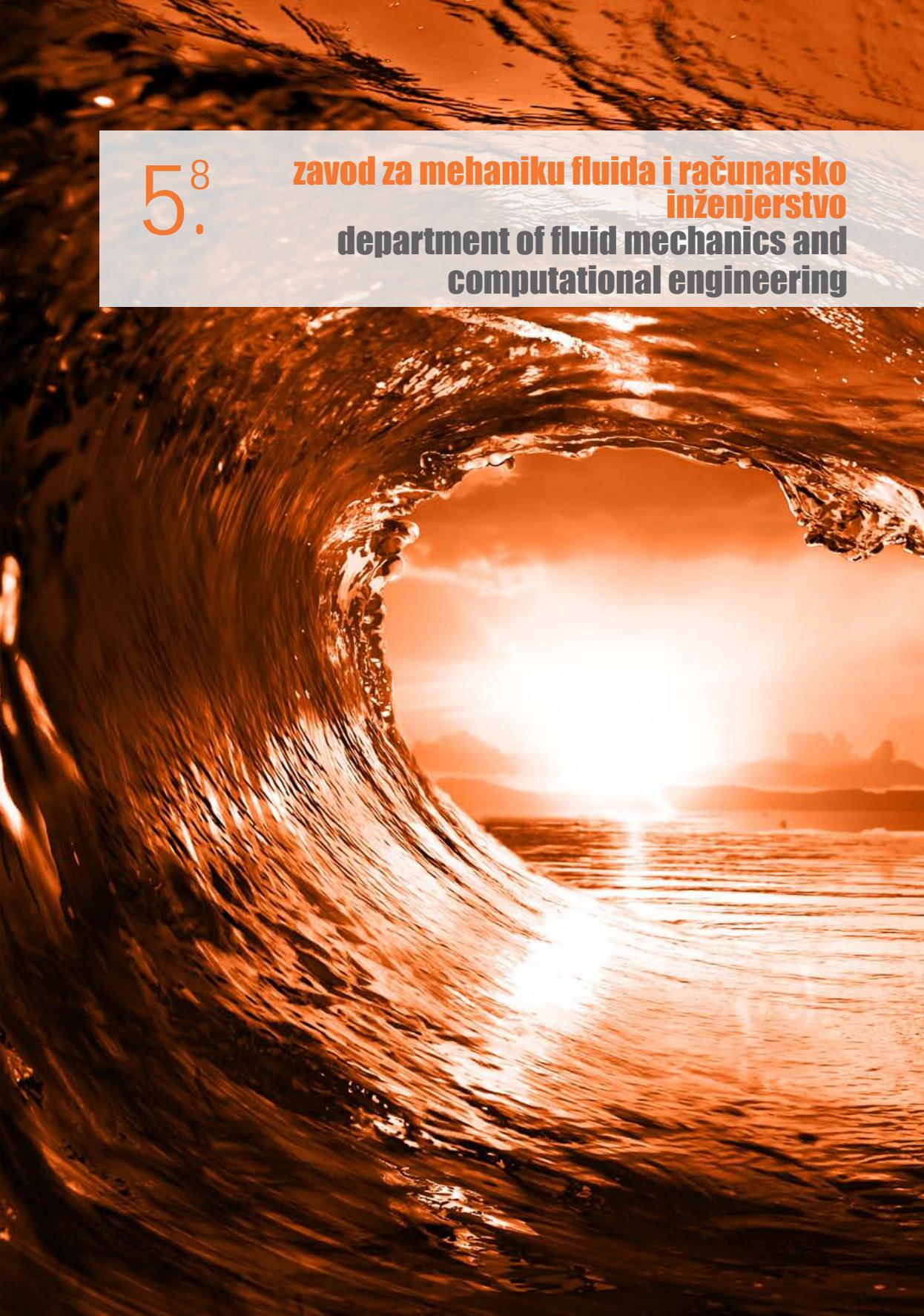
#### MEĐUNARODNA SURADNJA | INTERNATIONAL COLLABORATIONS

- Faculty of Mechanical Engineering, State University of Campinas, Campinas, Brazil / Brasil
- Faculty of Mechanical Engineering, University of Ljubljana, Ljubljana, Slovenija / Slovenia
- Institute of Metals and Technology, Ljubljana, Slovenija / Slovenia
- John von Neumann Faculty of Informatics, Obuda University, Madarska / Hungary
- Materials Engineering, Silesian University of Technology in Gliwice, Gliwice, Polska / Poland
- Metallurgy and Materials Science Research Institute, Chulalongkorn University, Bangkok, Tajland / Thailand
- The Institute of Materials, Minerals and Mining, Velika Britanija / UK



5.<sup>8</sup>

**zavod za mehaniku fluida i računarsko  
inženjerstvo**  
**department of fluid mechanics and  
computational engineering**





**PREDSTOJNIK ZAVODA | DEPARTMENT HEAD:**

Izv. prof. dr. sc. / Assoc. Prof. D. Sc. **Lado Kranjčević**

<http://www.riteh.uniri.hr/ustroj/zavodi/zmfri/>

# djelatnici

## faculty and staff

**REDOVITI PROFESORI | PROFESSORS**

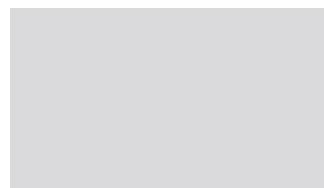


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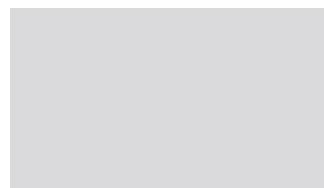
**Zoran Mrša**

*strujanje u priobalnom području; analiza i optimizacija hidrauličkih sustava; analiza i optimizacija strujanja u hidroturbinama*  
*coastal flow; hydraulic systems analysis and optimization; hydroturbine flow analysis and optimization*



**Luka Sopta**

*strujanje u priobalnom području; analiza i optimizacija hidrauličkih sustava; strujanje u otvorenim vodotocima; hidraulički tranzijenti*  
*coastal flow; hydraulic systems analysis and optimization; open channel flow; hydraulic transients*

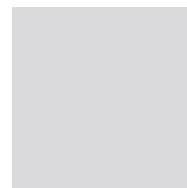


**IZVANREDNI PROFESORI | ASSOCIATE PROFESSORS**



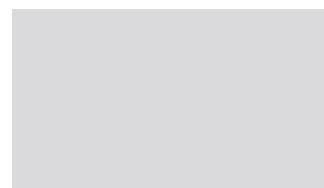
**Zoran Čarija**

*analiza i optimizacija hidrauličkih sustava; analiza i optimizacija strujanja u hidroturbinama; strujanje sa slobodnom površinom*  
*hydraulic systems analysis and optimization; hydroturbine flow analysis and optimization; free surface fluid flow*



**Lado Kranjčević**

*numeričko modeliranje strujanja u otvorenim vodotocima; strujanje u mreži cjevovoda; paralelno programiranje*  
*pipe network flow; open channel flow; parallel programming*



Siniša Družeta

*strujanje u priobalnom području; analiza i optimizacija hidrauličkih sustava; strujanje u otvorenim vodotocima  
coastal flow; hydraulic systems analysis and optimization; open channel flow*



DOCENTI | ASSISTANT PROFESSORS

Jerko Škifić

*hidraulički tranzijenti; analiza i optimizacija hidrauličkih sustava;  
programiranje tehničkih aplikacija  
hydraulic transients; hydraulic systems analysis and  
optimization; technical software development*



ZNANSTVENI NOVACI | JUNIOR RESEARCHERS

Stefan Ivić poslijedoktorand | Postdoctoral Research Assistant

*programiranje tehničkih aplikacija; polaganje cjevovoda;  
optimizacija  
technical software development; pipe laying;  
optimization*



## nastava i znanost education and science

Nastava se izvodi iz područja: mehanika fluida, hidraulički strojevi, računalne metode, numeričko modeliranje, optimizacija.

CO: Primjena računarskih metoda

Lectures in the field of: fluid mechanics, hydraulic machines, computational methods, numerical modeling, optimization.

LLL: Applied Computational Methods

### KOLEGIJI NA PREDDIPLOMSKIM SVEUČILIŠNIM STUDIJIMA

| UNDERGRADUATE UNIVERSITY COURSES

- Računalne aplikacije u inženjerstvu
- Uvod u računarstvo
- Mehanika fluida
- Računarske metode
- Hidraulički strojevi
- Programiranje
- Računalna grafika
- Računalne simulacije u tehniči
- Računarsko inženjerstvo

- Computer Applications in Engineering
- Introduction to Computer Science
- Fluid Mechanics
- Computational Methods
- Hydraulic Machines
- Programming
- Computer Graphics
- Computer Simulations in Engineering
- Computational Engineering

## KOLEGIJI NA DIPLOMSKIM SVEUČILIŠNIM STUDIJIMA

### | GRADUATE UNIVERSITY COURSES

- *Dinamički sustavi*
- *Dinamika fluida*
- *Modeliranje u tehniči*
- *Numeričko modeliranje hidrauličkih strojeva*
- *Optimizacije u tehniči*
- *Primjena paralelenog računanja*
- *Primjena računalne grafike*
- *Programiranje tehničkih aplikacija I*
- *Programiranje tehničkih aplikacija II*
- *Računalom podržano mjerjenje*
- *Računalna mehanika fluida*
- *Upoznavanje industrijskih postrojenja*
- *Računarske metode u brodogradnji*
- *Dynamic Systems*
- *Fluid Dynamics*
- *Models in Engineering*
- *Numerical Modeling of Hydraulic Machines*
- *Optimization in Technics*
- *Applied Parallel Computing*
- *Applied Computer Graphics*
- *Programming of Technical Applications I*
- *Programming of Technical Applications II*
- *Computer Aided Measuring*
- *Computational Fluid Dynamics*
- *Insight to Industrial Facilities*
- *Computational Methods in Naval Engineering*

## KOLEGIJI NA PREDDIPLOMSKIM STRUČNIM STUDIJIMA

### | UNDERGRADUATE VOCATIONAL COURSES

- *Hidraulički strojevi ST*
- *Mehanika fluida ST*
- *Hydraulic Machines ST*
- *Fluid Mechanics ST*

## KOLEGIJI NA POSLIJEDIPLOMSKIM SVEUČILIŠNIM (DOKTORSKIM) STUDIJIMA

### | POSTGRADUATE UNIVERSITY (DOCTORAL) COURSES

- *Dinamika fluida*
- *Hidrodinamika turbostrojeva*
- *Turbulentno strujanje*
- *Modeliranje onečišćenja zraka*
- *Računalna mehanika fluida*
- *Modeliranje strujanja sa slobodnom površinom*
- *Modeliranje nestacionarnog strujanja u cjevovodu*
- *Fluid Dynamics*
- *Hydrodynamics of Turbomachines*
- *Turbulent Flow*
- *Air Quality Modeling*
- *Computational Fluid Mechanics*
- *Free Surface Flow Modeling*
- *Unsteady Pipe Flow Modeling*

## ZNANSTVENOISTRAŽIVAČKI RAD | SCIENTIFIC RESEARCH

- *Strujanje u priobalnom području*  
*Coastal flow*
- *Strujanje u otvorenim vodotocima*  
*Open channel flow*
- *Analiza i optimizacija hidrauličkih sustava*  
*Hydraulic systems analysis and optimization*
- *Hidraulički tranzijenti*  
*Hydraulic transients*
- *Strujanje u cjevovodima*  
*Pipe flow*
- *Turbine*  
*Turbomachinery*



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**PROJEKTI | PROJECTS**

- Kranjčević, L., Arbula, D., Vidučić, D.: *ISVURI - faza II*, 2015.  
Kranjčević, L., Arbula, D., Vidučić, D.: *ISVURI - phase II*, 2015.
- Sopata, L., Družeta, S., Škifč, J.: *Matematički model spoja Rječine i Mrtvog kanala odnosno poplavljivanja donjeg toka Rječine*, Rijeka, 2015.  
Sopata, L., Družeta, S., Škifč, J.: *Mathematical model of a junction between Rječina and Mrtvi kanal with lower Rječina flooding*, Rijeka, 2015.
- Sopata, L., Družeta, S., Škifč, J.: *Analiza crpljenja morske vode kroz mikrotunel*, Rijeka, 2016.  
Sopata, L., Družeta, S., Škifč, J.: *Micro tunnel sea water feeding analysis*, Rijeka, 2016.
- Bulić, N., Braut, S., Kranjčević, L.: *Strojarsko – elektrotehničko vještovanje u parničnom predmetu*, 2015.  
Bulić, N., Braut, S., Kranjčević, L.: *Mechanical and electrical engineering expertise in civil action*, 2015.
- Čavrak, M., Kranjčević, L.: *Određivanje optimalne lokacije mjerne postaje za praćenje utjecaja TE Plomin na kvalitetu zraka na području Primorsko-goranske županije*, 2015.  
Čavrak, M., Kranjčević, L.: *Optimal location assesment of the measurement station for monitoring the TPP Plomin influence on air quality in Primorsko-goranska county*, 2015
- Čarija, Z., Mrša, Z.: *Ventilacija palubnih prostora live-stock carrier-a gradnja 522*, 2015  
Čarija, Z., Mrša, Z.: *Live-stock carrier- 522 deck ventilation*, 2015
- Čarija, Z., Mrša, Z.: *Ventilacija palubnih prostora live-stock carrier-a gradnja 526*, 2015  
Čarija, Z., Mrša, Z.: *Live-stock carrier- 526 deck ventilation*, 2015
- Čarija, Z., Kranjčević, L.: *Hidraulički proračun dovodnog i odvodnog sustava HE Senj - recenzija*, 2015  
Čarija, Z., Kranjčević, L.: *HPP Senj inflow and outflow system hydraulic analysis - review*, 2015



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**PUBLIKACIJE | PUBLICATIONS****RADOVI U ČASOPISIMA | JOURNAL PAPERS**

- Družeta, S., Ivić, S., *Examination of benefits of personal fitness improvement dependent inertia for Particle Swarm Optimization*, *Soft Computing*, 1433-7479, 1-14, 2016, Berlin, Heidelberg
- Ivić, S., Grbčić, L., Družeta, S., *Cooperative random walk for pipe network layout optimization*, *International Journal of Applied Engineering Research*, 0973-4562, 4 (11), 2839-2847, 2016 New Delhi
- Ivić, S., *Sensitivity analysis of S-lay pipe-laying configuration*, *International Journal of Applied Engineering Research*, 43250, 22, 2015

**MEĐUNARODNI KONGRESI | INTERNATIONAL CONGRESSES**

- Crnković, B., Ivić, S., *Numerical analysis of the DSMC algorithm for multi-agent systems*, *The Fourth Najman Conference on Spectral Problems for Operators and Matrices*, 2015, Opatija
- Vidas J., Šnjarić D., Braut A., Čarija Z., Brekalo P.I., Vidovic I.R., Persic B., *An ex vivo analysis of apical irrigant pressure developed by different irrigation needle types at various irrigant flow rates* *International Endodontic Journal Conference*, 2015, Barcelona

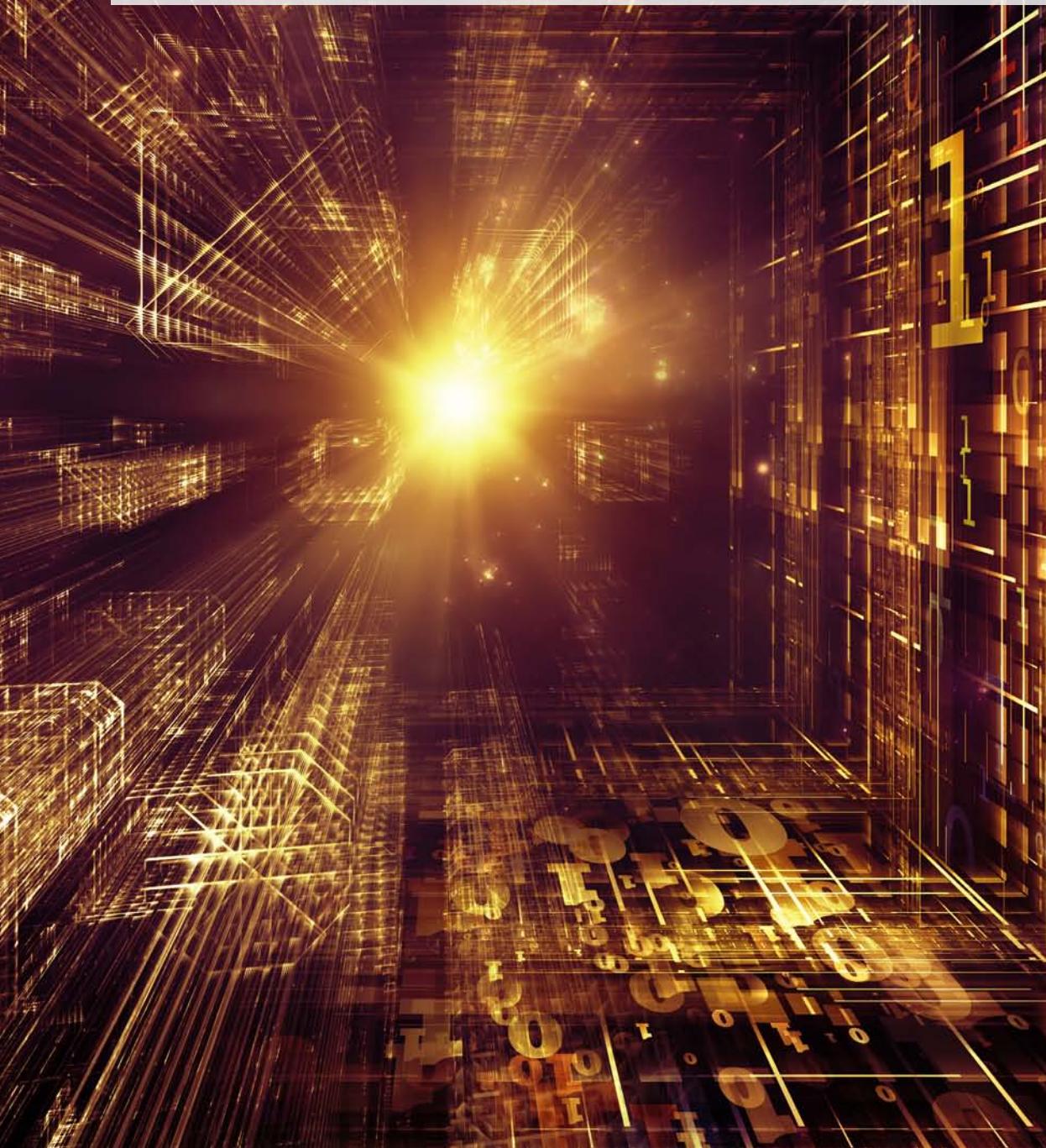
**MEĐUNARODNA SURADNJA | INTERNATIONAL COLLABORATIONS**

- *National Institute of Oceanography and Experimental Geophysics, Trst, Italija / Italy*



**5.<sup>9</sup>**

**zavod za računarstvo**  
**department of computer engineering**





**PREDSTOJNIK ZAVODA | DEPARTMENT HEAD:**

Prof. dr. sc. / Prof. D. Sc. **Željko Jeričević**

<http://www.riteh.uniri.hr/ustroj/zavodi/zr/>

# djelatnici

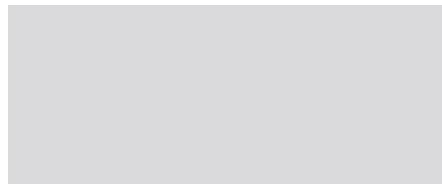
## faculty and staff

**REDOVITI PROFESORI | PROFESSORS**



**Ivo Ipšić**

*umjetna inteligencija; raspoznavanje uzorka;  
govorne tehnologije  
artificial intelligence; pattern recognition;  
speech technologies*

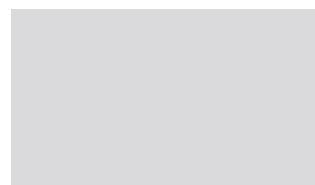


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**Željko Jeričević**

*znanstveno računanje; bioračunalstvo; razvoj algoritama;  
digitalna obrada slike  
scientific computing; biocomputing; algorithm development;  
digital image processing*

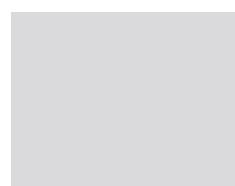


**IZVANREDNI PROFESORI | ASSOCIATE PROFESSORS**



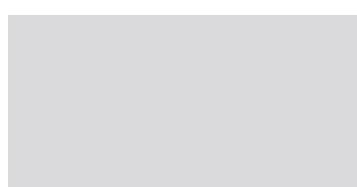
**Miroslav Joler**

*bežične komunikacije; računalni elektromagnetizam; biomedicinske  
aplikacije elektromagnetizma; mobilne aplikacije  
wireless communications; computational electromagnetics; biomedical  
applications of electromagnetics; applications for mobile*



**Kristijan Lenac**

*mobilna robotika; operacijski sustavi; razvoj algoritama;  
ugradbeni sustavi  
mobile robotics; operating systems; algorithm  
development; embedded systems*



DOCENTI | ASSISTANT PROFESSORS

Tihana Galinac Grbac

*programsko inženjerstvo; meko računarstvo; inženjerski menadžment; informacijsko-komunikacijske tehnologije*  
software engineering; soft computing; engineering management; information-communication technologies



Jonatan Lerga

*digitalna obrada signala; vremensko-frekvencijska analiza signala*  
digital signal processing; time-frequency signal analysis



Ivan Štajduhar

*umjetna inteligencija; strojno učenje*  
artificial intelligence; machine learning



Mladen Tomic

*digitalna obrada signala i slike; teorija valića; fitarski slogovi*  
digital signal and image processing; wavelets and filter banks



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ASISTENTI | ASSISTANTS

Sandi Ljubić poslijedoktorand | Postdoctoral Research Assistant

*interakcija čovjeka i računala; mobilne aplikacije; inženjerstvo upotrebljivosti; univerzalni pristup*  
human-computer interaction (HCI); mobile applications; usability engineering; universal access



Damir Arbula poslijedoktorand | Postdoctoral Research Assistant

*bežične mreže osjetila; raspodjeljeni algoritmi; lokalizacija*  
wireless sensor networks; distributed algorithms; localization



Goran Mauša

*umjetna inteligencija; neuronske mreže; meko računarstvo*  
artificial intelligence; neural networks; soft computing





**Diego Sušanj**

*ugradbeni sustavi; umjetna inteligencija; računalni vid  
embedded systems; artificial intelligence; computer vision*

**VANJSKI SURADNICI | ASSOCIATES**

**Renato Filjar**

*postupci određivanja položaja; navigacije i vremenskog uskladišivanja obrada signalâ; ionosferski uticaji na tehnološke sisteme; usluge zasnovane na lokaciji; programski određen radio*

*positioning; navigation and timing (PNT) methods and systems; Signal processing; Space weather and ionospheric effects on technological systems; Location Based Services (LBS); Software-Defined Radio (SDR)*

**Predrag Domijan**

*građa računala  
computer architecture*

**Dean Noč**

**Iva Vlah**  
**Ivona Franković**  
**Ines Janković**  
**Stjepan Picek**  
**Vjeran Tuhtan**  
**Edi Grbac**  
**Ivan Ivakić**

# nastava i znanost education and science



**KOLEGIJI NA PREDDIPLOMSKIM SVEUČILIŠNIM STUDIJIMA**

| UNDERGRADUATE UNIVERSITY COURSES

**162**

- *Algoritmi i strukture podataka*
- *Baze podataka*
- *Dijagnostičke metode u medicini I*
- *Dijagnostičke metode u medicini II*
- *Gradsa računala*
- *Informacijski sustavi*
- *Operacijski sustavi*
- *Osnove znanstvenog računanja*
- *Programsko inženjerstvo*
- *Programiranje*
- *Računalne mreže*
- *Razvoj web aplikacija*
- *Ugradbeni računalni sustavi*
- *Uvod u objektno orijentirano programiranje*
- *Uvod u računalstvo*

- *Algorithms and Data Structures*
- *Database Systems*
- *Diagnostic Methods in Medicine I*
- *Diagnostic Methods in Medicine II*
- *Computer Architecture*
- *Information Systems*
- *Operating Systems*
- *Foundations of Scientific Computation*
- *Software Engineering*
- *Programming*
- *Computer Networks*
- *Web Applications Development*
- *Embedded Systems*
- *Introduction to Object Oriented Programming*
- *Introduction to Computer Engineering*

**KOLEGIJI NA DIPLOMSKIM SVEUČILIŠNIM STUDIJIMA**

| GRADUATE UNIVERSITY COURSES

- *Bežične mreže osjetila*
- *Bioinformatika*
- *Gradsa računala*
- *Komunikacija čovjek-stroj*
- *Mobilne komunikacije*
- *Napredni algoritmi i strukture podataka*
- *Napredne računalne mreže*
- *Objektno orijentirano programiranje*
- *Programiranje ugradbenih sustava*
- *Računalna obrada govora i jezika*
- *Radiokomunikacije*

- *Wireless Sensor Networks*
- *Bioinformatics*
- *Computer Architecture*
- *Human-Machine Interaction*
- *Mobile Communications*
- *Advanced Algorithms and Data Structures*
- *Advanced Computer Networks*
- *Object Oriented Programming*
- *Embedded Systems Programming*
- *Computer Speech and Language Processing*
- *Radiocommunications*

- Razvoj mobilnih aplikacija
- Teorija informacija i kodiranja
- Upravljanje u programskom inženjerstvu
- Usluge zasnovane na lokaciji
- Napredna korisnička sučelja
- Analiza računalnih i komunikacijskih sustava
- Strojno učenje
- Digitalna obrada slike
- Programski određen radio
- Digitalna mikroskopija
- Razvoj internetskih aplikacija
- Mobile Applications Development
- Information Theory and Coding
- Software Engineering Management
- Location-Based Services
- Advanced User Interfaces
- Computer and communication system analysis
- Machine Learning
- Digital Image Processing
- Software-Defined Radio
- Digital Microscopy
- Internet Applications Development

**KOLEGIJI NA PREDDIPLOMSKIM STRUČNIM STUDIJIMA**

| UNDERGRADUATE VOCATIONAL COURSES

- Informacije i komunikacije
- Primjena računala ST
- Računalne mreže ST
- Radiokomunikacije ST
- Svetlovodne mreže
- Telekomunikacijski uređaji i mreže
- Information and Communication
- Applied Computing ST
- Computer Networks ST
- Radiocommunications ST
- Optical Networks
- Telecommunication Devices and Networks

**ZNANSTVENOISTRAŽIVAČKI RAD | SCIENTIFIC RESEARCH**

- Bežične mreže osjetila, raspodijeljeni algoritmi  
Wireless sensor networks, distributed algorithms
- Programsko inženjerstvo, informacijsko-komunikacijske tehnologije  
Software engineering, information-communication technologies
- Računalna obrada govora i jezika, raspoznavanje uzorka  
Speech processing and pattern recognition
- Razvoj i optimizacija algoritama  
Development and optimization of algorithms
- Rekonfigurable i nosive antene, samoadaptivni sustavi, numeričko modeliranje širenja vala  
Reconfigurable and wearable antennas, self-adaptive systems, numerical modeling of wave propagation
- Mobilna robotika, autonomni sustavi, interakcija čovjeka i računala  
Mobile robotics, autonomous systems, human computer interaction
- Digitalna obrada signala, vremensko-frekvencijska analiza signala  
Digital signal processing, time-frequency signal analysis
- Digitalna obrada signala, adaptivni wavelet algoritmi  
Digital signal processing, adaptive wavelet algorithms
- Inženjerstvo upotrebljivosti, prediktivno modeliranje i vrednovanje, univerzalni pristup  
Usability engineering, predictive modeling and evaluation, universal access
- Analiza slike, računalom potpomognuto dijagnostiranje, strojno učenje  
Image analysis, computer aided diagnosis, machine learning
- Digitalna obrada slike, računalni vid, umjetna inteligencija  
Digital image processing, computer vision, artificial intelligence
- Umjetna inteligencija, meko računarstvo, predviđanje programskih neispravnosti  
Artificial intelligence, soft computing, software defect prediction



## PROJEKTI | PROJECTS

- Galinac Grbac, T., *Programski sustavi u evoluciji: analiza i inovativni pristupi pametnom upravljanju*, Hrvatska Zaklada za Znanost, UIP-2014-09-7945, uspostavni istraživački projekt Galinac Grbac, T., *Evolving Software Systems: Analysis and Innovative Approaches for Smart Management (EVOSOFT)*, Croatian Science Foundation, UIP-2014-09-7945, Tihana Galinac Grbac, 2015 - 2018, instalation research grant
- Galinac Grbac, T., *Teorija iz ponašanja tipova za pouzdane velike programske sustave*, COST Action IC1201, voditelj za HR: Tihana Galinac Grbac, 2012-2016, znanstveno-istraživački. Galinac Grbac, T., *Behavioral Types for Reliable Large-Scale Software Systems*, COST Action, project no. IC1201, MC Cro: Tihana Galinac Grbac, 2012-2016.
- Galinac Grbac, T., *Pouzdana mreža Internetskih usluga temeljanja na samoupravljanju*, COST Action IC 1304, voditelj za HIR: Tihana Galinac Grbac, 2013-2017, znanstveno-istraživački. Galinac Grbac, T., *Autonomous Control for a Reliable Internet of Services*, COST Action, project no. IC1304, MC Cro: Tihana Galinac Grbac, 2013-2017.
- Galinac Grbac, T., *Analiza i inovativni pristupi razvoju, upravljanju i primjeni kompleksnih softverskih sustava*; Sveučilište u Rijeci; 58.384,02; 2013 - 2016, Tihana Galinac Grbac, znanstveno-istraživački. Galinac Grbac, T., *Analysis and innovative approaches to management and application of complex software systems*, University of Rijeka, 58.384,02; 2013-2017, Tihana Galinac Grbac, research and scientific project
- Joler, M., *Studija utjecaja proze na ponašanje rezonantnih frekvencija mikrotrakastih antena*. Sveučilište u Rijeci, znanstveno-istraživački. Voditelj projekta. Joler, M., *A study of the Slot Effects on the Behavior of Resonant Frequencies of Microstrip Antennas*. Funded by: University of Rijeka, Croatia. Scientific research. Principal Investigator.
- Štajduhar, I., *Automatizirana detekcija oblika ozljede ligamenta koljena iz snimke koljena magnetskom rezonancijom*. Financirano od strane agencije TÜBITAK. Partneri: Sveučilište Sabanci, Istanbul, Turska i KBC Rijeka. Voditelj projekta. Štajduhar, I., *Automated Detection of Knee Ligament Injury from Magnetic Resonance Scans*. Funded by The Scientific & Technological Research Council of Turkey (TÜBITAK). Partners: Sabanci University, Istanbul, Turkey and Clinical Hospital Center Rijeka. Principal Investigator.
- Lenac, K., Sušanj, D., *Dalekometna 3D percepcija u stvarnom vremenu*. Financirano od strane agencije HAMAG-BICRO u sklopu 6. kruga Programa provjere inovativnog koncepta (PoC6) Lenac, K., Sušanj, D., *Real-time long range 3D perception*. Funded by HAMAG-BICRO as part of 6th round of Proof of concept program (PoC6)

## PUBLIKACIJE | PUBLICATIONS

### RADOVI U ČASOPISIMA | JOURNAL PAPERS

- Šegon, G., Lerga, J., Sučić, V., *Improved LPA-ICI-Based Estimators Embedded in a Signal Denoising Virtual Instrument*, *Signal, Image and Video Processing*, ISSN: 1863-1711, 2016, 1-8 2016
- Bujak, M., Ratkaj, I., Markova-Car, E., Jurišić, D., Horvatić, A., Vučinić, S., Lerga, J., Baus-Lončar, M., Pavelić, K., Kraljević Pavelić, S., *Inflammatory Gene Expression Upon TGF-β1- Induced p38 Activation In Primary Dupuytren's Disease Fibroblasts*, *Frontiers in Molecular Biosciences*, 2 (2015), 1-9, 2015



- Mauša, G., Galinac Grbac, T., Dalbelo Bašić, B., A Systematic Data Collection Procedure for Software Defect Prediction, *Computer Science and Information Systems Journal*, ISSN: 1820-0214 (Print), 2406-1018 (Online), 13 (1), 173 - 197, 2016
- Kathiravelu, P., Galinac Grbac, T., Veiga, L., A FIRM Approach to Software-Defined Service Composition, *Computing Research Repository*, 1601,02131, 1 - 10, 2016

**MEĐUNARODNI KONGRESI | INTERNATIONAL CONGRESSES**

- Ljubić, S., Three Text Entry Methods Based on Smartphone Discrete Tilting: An Empirical Evaluation, *UAHCI/HCII 2016; Universal Access in Human-Computer Interaction: Interaction Techniques and Environments (Part II)*, Lecture Notes in Computer Science 9738, Springer, ISBN: 978-3-319-40243-7, 141-152, 2016, Toronto, Canada
- Joler, M., Hodanić, D., Šegon, G., Interpolative Computation of Two Slot Dimensions in a Rectangular Microstrip Antenna Given the Mode Number and the Resonant Frequency, 24th International Conference on Software, Telecommunications, and Computer Networks (SoftCOM 2016), 2016, Split, Croatia
- Sušanj, D., Arbula, D., Distributed, Graph Reduction Algorithm with Parallel Rigidity Maintenance, *Proceedings of the 39th International Convention on Information and Communication Technology*, 978-953-233-087-8, 253-256, 2016, Opatija, Croatia
- Miškić-Pleterac, N., Lenac, K., Distributed real-time lift kinematic monitoring using COTS smartphones, *Proceedings of the 39th International Convention on Information and Communication Technology*, 978-953-233-087-8, 2016, Opatija, Croatia
- Sušanj, D., Gulan, G., Kožar, I., Jeričević, Ž., Bone Shape Characterization Using the Fourier Transform and Edge Detection in Digital X-Ray Images, *Proceedings of the 39th International Convention on Information and Communication Technology*, 978-953-233-087-8, 380-382, 2016, Opatija, Croatia
- Kathiravelu, P., Galinac Grbac, T., Veiga, L., Building Blocks of Mayan: Componentizing the eScience Workflows Through Software-Defined Service Composition, *International Conference on Web Services*, 9,78147E+12, 0 - 8, 2016, San Francisco, USA
- Galinac Grbac, T., Runeson, P., 'Plug-in' Software Engineering Case Studies, *Fourth Intl. Workshop on Conducting Empirical Studies in Industry CESI 2016*, ISBN: 978-1-4503-4154-7, 21 - 24, 2016, Austin, USA
- Grbac Babić, S., Galinac Grbac, T., Graph-Based Analysis and Metrics of Evolving Open-Source Software Systems, "Proceedings of the 18th International Multiconference INFORMATION SOCIETY", ISBN 978-961-264-088-0, 9 - 12, 2015, Ljubljana, Slovenia

**POZVANA PREDAVANJA | INVITED LECTURES**

- Joler, M., Modern Design of Multiband Antennas for Mobile, 24th International Conference on Software, Telecommunications, and Computer Networks (SoftCOM 2016), 2016, Split, Croatia

**MEĐUNARODNA SURADNJA | INTERNATIONAL COLLABORATIONS**

- Institute of Informatics, Faculty of eleclrical engineering and computer science, University of Maribor Slovenia, Slovenija / Slovenia
- Department of Mathematics and Informatics, Faculty of Sciences, University of Novi Sad, Srbija / Serbia



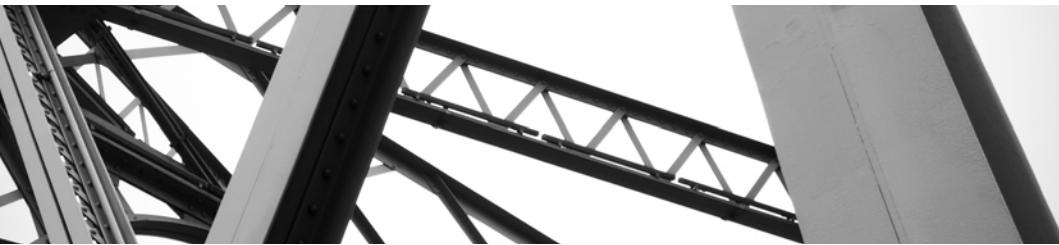
- Faculty of Informatics, Eötvös Loránd University, Mađarska / Hungary
- Sabanci University, Faculty of Engineering and Natural Sciences, Istanbul, Turska / Turkey
- University of Trieste, Trieste, Italija / Italy
- AIBS Lab S.r.l., Trieste, Italija / Italy



**5.<sup>10</sup>**

**zavod za tehničku mehaniku**  
**department for engineering mechanics**





**PREDSTOJNIK ZAVODA | DEPARTMENT HEAD:**

Prof. dr. sc. / Prof. D. Sc. Josip Brnić

<http://www.riteh.uniri.hr/ustroj/zavodi/ztm/>

# djelatnici

## faculty and staff

**REDOVITI PROFESORI | PROFESSORS**

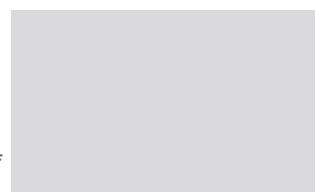


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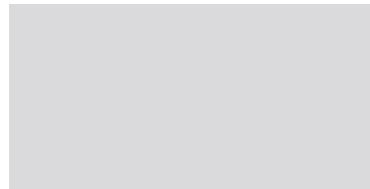
**Josip Brnić**

statika; čvrstoča konstrukcija; teorija elastičnosti i plastičnosti;  
metoda konačnih elemenata; eksperimentalna mehanika;  
optimizacija konstrukcija; mehanika grešaka i loma  
statics; strength of materials; theory of elasticity and plasticity;  
finite element method; experimental mechanics; optimization of  
structures; failure and fracture mechanics



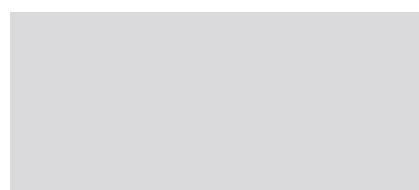
**Goran Turkalj**

čvrstoča konstrukcija; elasto-plastomehanika; stabilnost  
konstrukcija; računarska analiza konstrukcija  
strength of materials; elasto-plastomechanics; structural  
stability; computational structural analysis



**Marko Čanadija**

termomehanika; eksperimentalna mehanika; statika;  
metoda konačnih elemenata; nanomehanika  
thermomechanics; experimental mechanics; statics;  
finite element method; nanomechanics



**Roberto Žigulić**

kinematika; dinamika; dinamika strojeva i robota; mehatronika;  
eksperimentalna ispitivanja u mehanici konstrukcija i strojeva  
kinematics; dynamics; dynamics of robots and machines;  
mechatronics; experimental testing in mechanics of  
structures and machines



**Domagoj Lanc**

*čvrstoća; elasto-plastomehanika; stabilnost konstrukcija; kompozitne konstrukcije  
strength of materials; elasto-plastomechanics; structural stability; composite structures*



**IZVANREDNI PROFESORI** | ASSOCIATE PROFESSORS

**Sanjin Braut**

*kinematika; dinamika; vibracije; regulacija i upravljanje dinamičkim sustavima; trajnost strojeva i konstrukcija; mehatronika  
kinematics; dynamics; vibration; dynamic system control; durability of machines and structures; mechatronics*



**DOCENT** | ASSISTANT PROFESSOR

**Marino Brčić**

*statika; čvrstoća konstrukcija; mehanika i elementi konstrukcija, laboratorijske vježbe; eksperimentalna ispitivanja u mehanici konstrukcija i strojeva; nanomehanika  
statics; strength of materials; mechanics and structural elements; experimental methods in mechanics; nanomechanics*



**VIŠI ASISTENTI** | SENIOR ASSISTANTS

**Sanjin Kršćanski**

*statika; čvrstoća konstrukcija; mehanika i elementi konstrukcija; laboratorijske vježbe  
statics; strength of materials; mechanics and structural elements; laboratory exercises*



**Igor Pešić**

*statika; čvrstoća konstrukcija; mehanika i elementi konstrukcija; laboratorijske vježbe  
statics; strength of materials; mechanics and structural elements; laboratory exercises*



**Goranka Štimac Rončević** znanstveni novak | junior researcher

*kinematika; dinamika; regulacija; aktivni magnetski ležajevi  
kinematics; dynamics; control; active magnetic bearings*





**Ante Skoblar**

*kinematika; dinamika; vibracije; akustika  
kinematics; dynamics; vibration; acoustics*

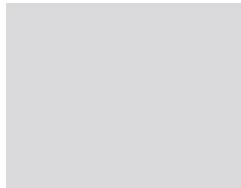


**ZNANSTVENI NOVACI | JUNIOR RESEARCHERS**



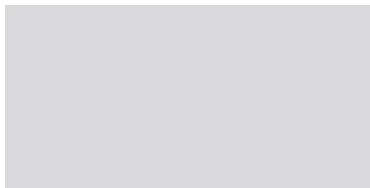
**Neven Munjas poslijedoktorand** | Postdoctoral Research Assistant

*statika; čvrstoča konstrukcija; mehanika i elementi konstrukcija;  
laboratorijske vježbe  
statics, strength of materials, mechanics and structural elements,  
laboratory exercises*



**Damjan Banić**

*na znanstvenom projektu Hrvatske zaklade za znanost  
(HRZZ)*



**VANJSKI SURADNICI | ASSOCIATES**

**170**

**Franc Kosek**

Fakulteta za Strojništvo, Univerza v Ljubljani, Ljubljana, Slovenija | Faculty of Mechanical Engineering, University of Ljubljana, Ljubljana, Slovenia

*tehnička mehanika; čvrstoča;  
elastoplastomehanika  
engineering mechanics; strength of materials;  
elasto-plastomechanics*

**Stojan Kravanka**

Fakulteta za Strojništvo, Univerza v Ljubljani, Ljubljana, Slovenija | Faculty of Mechanical Engineering, University of Ljubljana, Ljubljana, Slovenia

*tehnička mehanika; optimizacija konstrukcija  
engineering mechanics; structural optimization*

## nastava i znanost education and science

Nastava se izvodi iz područja primijenjene mehanike što uključuje analitičku, računalnu i eksperimentalnu mehaniku. Prema sadržaju razmatranja ovdje spadaju: statika, čvrstoča konstrukcija, stabilnost konstrukcija, mehanika konstrukcija, optimizacija konstrukcija, konačnoelementna analiza, tankostjene konstrukcije, računalna analiza konstrukcija, kompozitne konstrukcije, eksperimentalna ispitivanja u mehanici konstrukcija i strojeva, termomehanika, kontaktna mehanika, kinematika, dinamika, vibracije; akustika, regulacija i upravljanje dinamičkim sustavima; trajnost strojeva i konstrukcija; mehatronika, i.t.d.

Courses are running in the field of applied mechanics and includes analytical, computational and experimental mechanics. According to the content of consideration, here belong: statics, strength of materials, structural stability, structural mechanics, optimization of structures, finite element analysis, thin-walled structures, computational analysis of structures, composite structures, experimental testing of structures and machines, termomechanics, contact mechanics, kinematics, dynamics, vibrations, vibroacoustics, dynamic system control, durability of machines and structures; mechatronics, etc.

## KOLEGIJI NA PREDDIPLOMSKIM SVEUČILIŠNIM STUDIJIMA

| UNDERGRADUATE UNIVERSITY COURSES

- *Statika*
- *Kinematika*
- *Dinamika*
- *Čvrstoča konstrukcija*
- *Čvrstoča konstrukcija I*
- *Mehanika i elementi konstrukcija*
- *Računarska analiza konstrukcija*
- *Osnove primjene metode konačnih elemenata*
- *Statics*
- *Kinematics*
- *Dynamics*
- *Strength of Materials*
- *Mechanics of Materials I*
- *Mechanics and Structural Elements*
- *Computational Structural Analysis*
- *Introduction to Finite Element Method (FEM)*

## KOLEGIJI NA DIPLOMSKIM SVEUČILIŠNIM STUDIJIMA

| GRADUATE UNIVERSITY COURSES

- *Čvrstoča konstrukcija II*
- *Dinamika strojeva i robota*
- *Eksperimentalna ispitivanja u mehanici konstrukcija i strojeva*
- *Eksperimentalna ispitivanja u mehanici konstrukcija i strojeva*
- *Elasto i plastomehanika*
- *Mehanika kompozita*
- *Metoda konačnih elemenata čvrstih tijela*
- *Optimalni dizajn konstrukcija*
- *Regulacija i upravljanje dinamičkim sustavima*
- *Simulacija dinamičkih sustava*
- *Stabilnost konstrukcija*
- *Tankostjene konstrukcije*
- *Termomehanika*
- *Trajinost strojeva i konstrukcija*
- *Vibracije*
- *Strength of Materials II*
- *Dynamics of Machines and Robots*
- *Experimental Testing in Mechanics of Structures and Machines*
- *Experimental Testing in Mechanics of Structures and Machines*
- *Elasto and Plastomechanics*
- *Mechanics of Composites*
- *Finite Element Method of Solids*
- *Optimization of Structures*
- *Dynamic Systems Control*
- *Simulation of Dynamic System*
- *Structural Stability*
- *Thin-Walled Structures*
- *Thermomechanics*
- *Durability of Machines and Structures*
- *Vibration*

## KOLEGIJI NA PREDDIPLOMSKIM STRUČNIM STUDIJIMA

| UNDERGRADUATE VOCATIONAL COURSES

- *Čvrstoča*
- *Mehanika I*
- *Mehanika i elementni konstrukcija ST*
- *Mehanika II*
- *Strength of Materials*
- *Mechanics I*
- *Mechanics and Structural Elements ST*
- *Mechanics II*

## KOLEGIJI NA POSLIJEDIPLOMSKIM SVEUČILIŠNIM (DOKTORSKIM) STUDIJIMA

| POSTGRADUATE UNIVERSITY (DOCTORAL) COURSES

- *Elastomehanika i plastomehanika*
- *IP iz termomehanike*
- *Kinematika i dinamika robota*
- *Kontaktna mehanika*
- *MKE i optimizacija konstrukcija*
- *Nelinearna analiza konstrukcija*
- *Stabilnost konstrukcija*
- *Vibracije i trajnost strojeva i konstrukcija*
- *Elastomechanics and Plastomechanics*
- *Advanced Thermomechanics*
- *Kinematics and Dynamics of Robots*
- *Contact mechanics*
- *FEM and Optimization of Structures*
- *Nonlinear Structural Analysis*
- *Structural Stability*
- *Vibrations and Durability of Machines and Structures*
- *Viscoelasticity and Viscoplasticity*
- *Protection against Noise and Vibration of Machines and Structures*



**ZNANSTVENOISTRAŽIVAČKI RAD | SCIENTIFIC RESEARCH**

- Primijenjena mehanika: računalna mehanika, eksperimentalna mehanika, mehanika grešaka i loma konstrukcija, optimalni dizajn konstrukcija, stabilnost konstrukcija, mehanika kompozita, vibracije, vibroakustika, dinamika strojeva i konstrukcija, mehatronika, termomehanika, nanomehanika, integritet konstrukcija  
*Applied mechanics: computational mechanics, experimental mechanics, failure and fracture mechanics of structures, optimal structural design, structural stability, vibrations, vibroacoustics, dynamics of structures and machines, mechatronics, thermomechanics, nanomechanics, structural integrity*

**PROJEKTI | PROJECTS**

- Procjena ponašanja konstrukcija u graničnim uvjetima rada, Hrvatska zaklada za znanost, 2014 - 2018, Josip Brnić  
*Assessment of structural behaviour in limit state operating conditions, Hrvatska zaklada za znanost, znanstvenoistraživački, 2014 - 2018, Josip Brnić*
- Svojstva materijala, ponašanje pri puzaњu, lomna žilavost i mikrostruktura metalnih legura - eksperimentalne analize i numeričke simulacije, bilateralni projekt Hrvatska - Kina, 2014 - 2015, Josip Brnić  
*Material properties, creep behavior, fracture toughness and microstructure of metal alloys – experimental analysis and numerical simulations, bilateral project Croatia - China, 2014 - 2015, Josip Brnić*
- Utjecaj toplinske zone uzrokovane elektronskim snopom zavarenog martenzitnog čelika GX4CrNi13-4 na čvrstoću materijala pri zamoru, bilateralni projekt Hrvatska - Austria, 2014 - 2015, Josip Brnić  
*Influence of Heat Affected Zone of electron beam welded steel casting GX4CrNi13-4 on the fatigue strength, bilateral project Croatia - Austria, 2014 - 2015, Josip Brnić*
- Modeliranje i vibracijska dijagnostika rotacijskih strojeva, OJ 221 MT 146, Inicijalna potpora za mlađe istraživače, Sveučilište u Rijeci, Sanjin Braut  
*Modeling and vibration diagnosis of rotating machines, OJ 221 MT 146, Initial support for young researchers, University of Rijeka, Sanjin Braut*
- Redukcija vibracija i buke rotacijskih strojeva, OJ 213 MT 118, Potpora za istraživački tim s najmanje 5 istraživača, Sveučilište u Rijeci, Roberto Žigulić  
*Reduction of vibrations and noise of the rotational machines, OJ 213 MT 118, Support for the research team with min. 5 researchers, University of Rijeka, Roberto Žigulić.*
- Numerička analiza odziva konstrukcija i eksperimentalna istraživanja svojstava materijala, OJ 203, Sveučilište u Rijeci, Josip Brnić  
*Numerical analysis of structural response and experimental investigations of material properties, OJ 203, University of Rijeka, Josip Brnić*
- Razvoj numeričkih modela za analizu stabilnosti deformacijskih formi grednih konstrukcija, Sveučilište u Rijeci, Goran Turkalj, od 2013.  
*Development of numerical models for stability analysis of beam-type structure deformation modes, University of Rijeka, since 2013, Goran Turkalj*
- I. Eksperimentalna istraživanja svojstava materijala portalna i II. Analiza izvedenog stanja i procjena mehaničkog ponašanja dijela rasklopнog postrojenja 110 kV u EVP Vrata., Brnić, J., Čađađija, M., Lanc, D., Brčić, M., Turkalj, G.,  
*I. Experimental investigations of the material properties of the portal and II. Structural analysis and estimation of mechanical behaviour of the part of 110 KV plant in EVP Vrata*



- Konačnoelementno modeliranje laminatno kompozitnih konstrukcija grednog tipa, OJ11222, Sveučilište u Rijeci, Domagoj Lanc, od 2014.  
Finite element modeling of flaminated composite beam-type structures, OJ11222, University of Rijeka, Domagoj Lanc, since 2014.
- IPA Adriatic projekt/2. poziv/127/Premošćivanje tehničkih razlika i socijalnih podozrivosti u svrhu doprinosa transformacije Jadranske regije u stabilno čvorište održivog tehnološkog razvoja  
IPA Adriatic CBC/2nd Order/127/Bridge technical differences and social suspicions contributing to transform the Adriatic area in a stable hub for a sustainable technological development

**PUBLIKACIJE | PUBLICATIONS****RADOVI U ČASOPISIMA | JOURNAL PAPERS**

- Brnić, J., Turkalj, G., Čanađija, M., Lanc, D., Krščanski, S., Brčić, M., Li, Qi., Niu, J., Mechanical Properties, Short Time Creep and Fatigue of an Austenitic Steel Materials, 1996 - 1944, 9, 298-1-298-19, 2016
- Lanc, D., Turkalj, G., Vo, T. P., Brnić, J., Nonlinear buckling behaviours of thin-walled functionally graded open section beams, Composite Structures, 0263-8223, 152, 829-839, 2016
- Vukelić, G., Brnić, J., Predicted Fracture Behavior of Shaft Steels with Improved Corrosion Resistance Metals, 2075-4701, 6, 40-1-40-9 2016
- Gao, Zeng, Chen, Z.R., Wu, Y. H., Niu, J., Brnić, J., Structure and properties of welded joint of high-strength wear-resistant steel NM360, Materials Science and Technology, 0276-0836, 32 299-302, 2016
- Vukelić, G., Brnić, J., Analysis of Austenitic Stainless Steels (AISI 303 and AISI 316Ti) Regarding Crack Driving Forces and Creep Responses, Proceedings of the Institution of Mechanical Engineers, Part L: Journal of Materials: Design and Applications, 1464-4207 230, 699-704, 2016
- Brnić J., Turkalj G., Čanađija M., Lanc D., Brčić, M., Study of the Effects of High Temperatures on the Engineering Properties of Steel 42CrMo4, High Temperature Materials and Processes 0334-6455, 34, 27-34, 2015
- Vukelic, G., Brnic, J., Prediction of Fracture Behavior of 20MnCr5 and S275JR Steel Based on Numerical Crack Driving Force Assessment, Journal of Materials in Civil Engineering 0899-1561, 27, 04014132-1 - 04014132-5 , 2015
- Turkalj, G., Lanc, D., Brnić, J., Pešić, I., A beam formulation for large displacement analysis of composite frames with semi-rigid connections, Composite Structures, 0263-8223, 134, 237-246 2015
- Čanađija, M., Barretta, R., Marotti de Sciarra, F., On functionally graded Timoshenko nonisothermal nanobeams, Composite Structures, 0263-8223, 135, 286-296, 2016
- Čanađija, M., Barretta, R., Marotti de Sciarra, F., A gradient elasticity model of Bernoulli-Euler nanobeams in non-isothermal environments, European Journal of Mechanics, A/Solids, 0997-7538, 55, 243-255, 2016
- Barretta, R., Čanađija, M., Marotti de Sciarra, F., A higher-order Eringen model for Bernoulli-Euler nanobeams, Archive of Applied Mechanics, 0939-1533, 86, 483-495, 2016
- Skoblar, A., Anđelić, N., Žigulić, R., Determination of Critical Rotational Speed of Circular Saws from Natural Frequencies of Annular Plate with Analogous Dimensions, International Journal for Quality Research, 1800-6450, 10(1), 177-192, 2016



- Nguyen, Hoang X.; Lee, J., Vo, Thuc P.; Lanc, D., *Vibration and lateral buckling optimisation of thin-walled laminated composite channel-section beams*, Composite Structures, 0263-8223 143, 84-92, 2016
- Pešić, I., Lanc, D., Turkalj, G., *Non-linear global stability analysis of thin-walled laminated beam-type structures*, Computers & Structures, 173, 19-30, 2016

#### MEĐUNARODNI KONGRESI | INTERNATIONAL CONGRESSES

- Brčić, M., Čanađija, M., *Carbon Nanotube Imperfections: Review and Influence on Mechanical Properties*, Workshop on Multiscale Numerical Modeling of Material Deformation Responses from Macro to Nanolevel, 2016, Zagreb
- Čanađija, M., Munjas, N., Brnić, J., *A multiscale approach to thermoplastic deformation* Joint Annual Meeting of DMV-GAMM 2016, 2016, Braunschweig, Njemačka
- Brčić, M., Čanađija, M., Brnić, J., *Influence of Imperfections on Mechanical Properties of Carbon Nanotube Reinforced Polymer Matrix Nanocomposites*, Proceedings of the 8th International Congress of Croatian Society of Mechanics, 2015, Opatija
- Munjas, N., Čanađija, M., Brnić, J., *Thermo-mechanical multiscale modeling in plasticity of metals*, Proceedings of the 8th International Congress of Croatian Society of Mechanics, 2015 Opatija
- Čanađija, M., Mosler, J., *Variationally Consistent Thermoplastic Framework for Microstructure Evolution of Metals Undergoing Phase Changes*, COMPLAS XIII – Computational Plasticity XIII- Fundamentals and Applications, 2015, Barcelona, Španjolska
- Andelić, N.; Pavlović, A.; Braut S., *Variation of Natural Frequencies by Circular Saw Blade Rotation*, 8th International Congress of Croatian Society of Mechanics, Opatija, 2015. - Book of Abstracts, 1-11, 2015., Hrvatska
- Fragassa, C., Žigulić, R., Braut, S., *Effect of Design Parameters in Circular Saw Blades* 8th International Congress of Croatian Society of Mechanics, Opatija, 2015. - Book of Abstracts, 1-13, 2015., Hrvatska
- Žigulić, R., Fragassa, C., Skoblar, A., *A nonlinear vibrational model of the woodworking bandsaw*, 8th International Congress of Croatian Society of Mechanics, Opatija, 2015. - Book of Abstracts, 1-13, 2015., Hrvatska
- Braut, S., Žigulić, R., Štimac-Rončević, G., Skoblar, A., *Diagnosis of partial rotor–stator rubbing using Variational Mode Decomposition*, 14th World Congress in Mechanism and Machine Science - IFToMM, Taipei, Taiwan, 2015., 1-6, 2015., Tajvan
- Škorjanc, T., Žigulić, R., Andelić A., *AdriaHub ICT platforma*, 39th International convention on information and communication technology, electronics and microelectronics - mipro 2016, 1-6 2016. Hrvatska
- Blažević, S., Pilićić, S., Skoblar, A., Žigulić, R., Braut, S., *Analysis of Vibration of Vertical lathe Machining Centre*, 15th Youth Symposium on Experimental Mechanic, 1.tra, 2016., Italija



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#### POZVANA PREDAVANJA | INVITED LECTURES

- Čanađija, M., Brčić, M., *Estimation of Mechanical Properties of Carbon Nanotube Nanocomposites by Multiscale Methods*, Computational Multiscale Mechanics School, 2015 Rijeka, Hrvatska

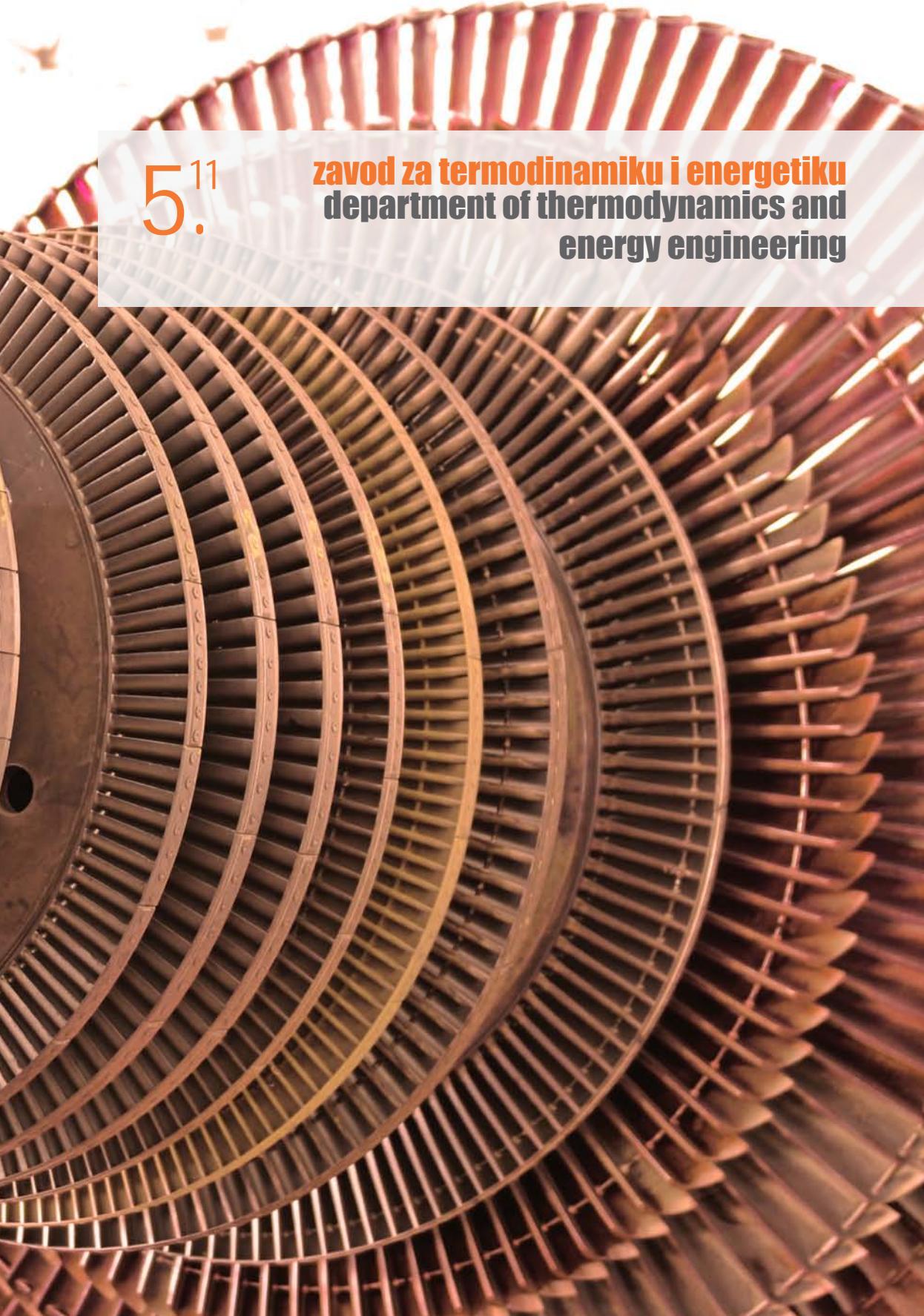
- *Turkalj, G., Updated Lagrangian Formulation for Large Displacement Analysis of Beam-Type Structures, School of Materials Science and Technology, Harbin Institute of Technology 2016 Harbin, Kina*
- *Lanc, D., Models for Non-Linear Analysis of Composite Thin-Walled Beams and Frames School of Materials Science and Technology, Harbin Institute of Technology, 2016, Harbin, Kina*
- *Brnić, J., Finite Element Analysis, Creep and Fatigue of Engineering Structures, School of Materials Science and Technology, Harbin Institute of Technology, 2016, Harbin, Kina*
- *Braut, S., Theory of MDOF (Multiple degree-of-freedom) vibrations Lappeenranta University of Technology, 2016, Lappeenranta, Finska*
- *Čanadija, M., A multiscale approach to thermoplasticity, Special Workshop on Multiscale Modelling of Heterogeneous Structures, 2016, Dubrovnik, Hrvatska*





5.<sup>11</sup>

**zavod za termodinamiku i energetiku**  
**department of thermodynamics and**  
**energy engineering**





**PREDSTOJNIK ZAVODA | DEPARTMENT HEAD:**

Prof. dr. sc. / Prof. D. Sc. **Vladimir Medica**

<http://www.riteh.uniri.hr/ustroj/zavodi/zte/>

# **djelatnici**

## faculty and staff

**REDOVITI PROFESORI | PROFESSORS**

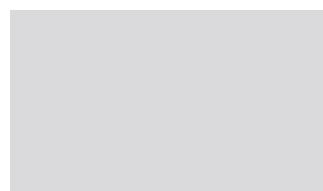


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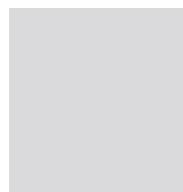
**Bernard Franković**

*termodinamika; prijenos topline i prijenos tvari; izmjenjivači topline; plinska tehnika; obnovljivi izvori energije  
refrigeration, thermal measurements, compressors, process equipment, heat pumps, energy efficiency, renewable energy sources*



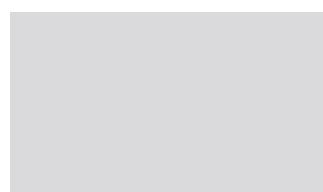
**Vladimir Medica**

*motori s unutarnjim izgaranjem; toplinski strojevi, brodski pogonski strojevi, numeričko modeliranje, numeričke simulacije izgaranja  
internal combustion engines, heat engines, ship propulsion machinery, numerical modelling, numerical simulations of combustion*



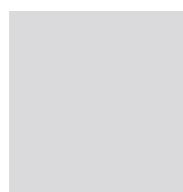
**Tomislav Mrakovčić**

*brodski energetski sustavi; brodski pogonski sustavi; brodski pomoći strojevi; numeričko modeliranje prijenosa topline i tvari  
marine energy systems; marine propulsion systems; marine auxiliary machinery; numerical modeling of heat and mass transfer*



**Branimir Pavković**

*tehnika hlađenja; mjerena u termoteknici; kompresori; procesna oprema; dizalice topline; energetska učinkovitost; obnovljivi izvori energije  
regeration; thermal measurements; compressors; process equipment; heat pumps; energy efficiency; renewable energy sources*



Anica Trp

*termodinamika; izmjerenjivači topline; numeričko modeliranje prijenosa topline i tvari; obnovljivi izvori energije*  
thermodynamics; heat exchangers; numerical modeling of heat and mass transfer; renewable energy sources



Kristian Lenić

*termodinamika; izmjerenjivači topline; numeričko modeliranje prijenosa topline i tvari; obnovljivi izvori energije*  
thermodynamics; heat exchangers; numerical modeling of heat and mass transfer; renewable energy sources



**DOCENTI | ASSISTANT PROFESSORS**

Vladimir Glažar

*inženjerska grafika; dokumentiranje; tehničko crtanje; oblikovanje pomoću računala; inženjerska vizualizacija*  
engineering graphics; documenting; technical drawing; modelling by computer; engineering visualization



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Tomislav Senčić

*termoenergetika; toplinski strojevi; goriva, maziva i voda*  
thermoenergetics; thermal machines; fuels, lubricants and water



Igor Wolf

*termotehnička oprema i sustavi; toplinska ugodnost; kvaliteta zraka u prostoru; obnovljivi izvori energije; centralni sustavi nadzora i upravljanja; optimizacija sustava*  
thermo-technical equipment and systems; thermal comfort; indoor air quality; renewable energy sources; central management and control systems; system optimization



**VIŠI ASISTENCI | SENIOR ASSISTANTS**

Igor Bonefačić

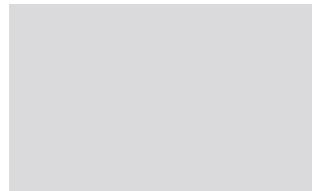
*termodinamika; numeričko modeliranje procesa izgaranja; prijenosa topline i tvari; obnovljivi izvori energije*  
thermodynamics; numerical modelling of combustion; heat and mass transfer; renewable energy sources





**Viktor Dragičević**

energetski sustavi; energetski i procesni uređaji;  
inženjerstvo zaštite okoliša  
thermodynamics; numerical modelling of combustion; heat and  
mass transfer; renewable energy sources

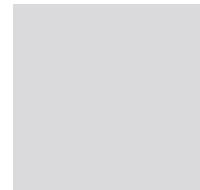


**ASISTENT | ASSISTANT**



**Mateo Kirinčić**

termodinamika; izmjenjivači topline; numeričko modeliranje prijenosa topline i  
tvari; obnovljivi izvori energije  
thermodynamics; heat exchangers; numerical modeling of heat and mass  
transfer; renewable energy sources



**ZNANSTVENI NOVACI | JUNIOR RESEARCHERS**



**Paolo Blecich poslijedoktorand | Postdoctoral Research Assistant**

termodinamika; numeričko modeliranje; obnovljivi izvori energije;  
energetska učinkovitost  
thermodynamics; numerical modelling; renewable energy sources;  
energy efficiency

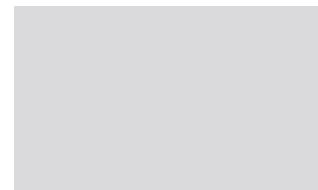


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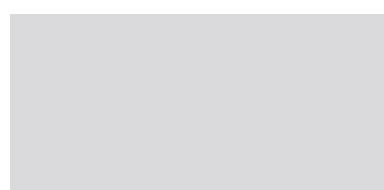
**Ozren Bukovac**

motori s unutranjim izgaranjem; termodinamika; toplinski strojevi;  
numeričko modeliranje; neuronske mreže  
internal combustion engines; thermodynamics; heat engines;  
numerical modeling; neural networks



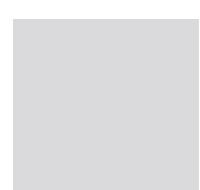
**Boris Delač**

tehnika hlađenja; mjerenja u termotehnici; kompresori;  
procesna oprema; dizalice topline  
refrigeration; thermal measurements; compressors;  
process equipment; heat pumps



**Vedran Mrzljak poslijedoktorand | Postdoctoral Research Assistant**

motori s unutranjim izgaranjem; termodinamika; toplinski strojevi; toplinske  
turbinе; numeričko modeliranje  
internal combustion engines; thermodynamics; heat engines; heat turbines;  
numerical modeling



**VANJSKI SURADNICI | ASSOCIATES**

**Ivan Jakovljević**

toplinske turbine  
termal turbines

**Bojan Jurdana**

toplinska tehnika  
gas technology

**Serđo Klapčić**

*izvori energije*  
heat sources

**Edi Kučan**

*brodski pomoći strojevi; brodski sustavi*  
marine auxiliary machinery; marine systems

**Katarina Knafelj**

*goriva i maziva*  
fuels and lubricants

## nastava i znanost education and science

*Nastava iz područja znanstvenih polja strojarstva, temeljnih i interdisciplinarnih tehničkih znanosti, znanstvenih grana procesnog energetskog strojarstva, brodskog strojarsva, termodinamike, energetike i inženjerstva okoliša, Energetski sistemi; Energetska postrojenja; Energetska oprema, uređaji i strojevi; Zaštita okoliša; Procesno inženjerstvo.*

*Program stručnog osposobljavanja osoba koje provode energetske preglede i/ili energetsko certificiranje zgrada s jednostavnim tehničkim sustavom (Modul 1).*

*Program stručnog osposobljavanja osoba koje provode energetske preglede i/ili energetsko certificiranje zgrada sa složenim tehničkim sustavom (Modul 2).*

*Lectures in the field of scientific fields of Mechanical Engineering, Fundamental and Interdisciplinary Engineering Sciences, the scientific branches of Process Energy Engineering, Marine Engineering, Thermodynamics, Energy Engineering and Environmental Engineering, Energy systems, Power plants, Energy equipment, facilities and engines, Environmental protection, Process engineering.*

*Education of persons who are to perform energy audits and/or energy certification of buildings with a simple technical system (Module 1).*

*Education of persons who are to perform energy audits and/or energy certification of buildings with a complex technical system (Module 2).*

### KOLEGIJI NA PREDDIPLOMSKIM SVEUČILIŠNIM STUDIJIMA

| UNDERGRADUATE UNIVERSITY COURSES

- Brodski pomoći strojevi
- Energetski sustavi
- Izvori energije
- Nauka o toplini I
- Tehnika grijanja
- Termodinamika BG
- Termodinamika i energetika
- Toplinski strojevi i uređaji
- Marine Auxiliary Machinery
- Energy Systems
- Energy Sources
- Thermodynamics I
- Heating Systems
- Thermodynamics NA
- Thermodynamics and Energy Engineering
- Thermal Engines and Devices

### KOLEGIJI NA DIPLOMSKIM SVEUČILIŠNIM STUDIJIMA

| GRADUATE UNIVERSITY COURSES

- Automatizacija i regulacija u sustavima klimatizacije
- Brodski energetski uređaji
- Brodski pogonski strojevi
- HVAC Control Systems
- Ship Energy Facilities
- Naval Propulsion Engines

- Brodski sustavi
- Brodski termotehnički sustavi
- Energetska postrojenja
- Energetski i procesni uređaji
- Goriva, maziva i voda
- Inženjerstvo zaštite okoliša
- Kompresori
- Laboratorijske vježbe u termotehnici
- Motori
- Nauka o toplini II
- Numeričko modeliranje u termodinamici
- Obnovljivi izvori energije
- Oprema procesnih postrojenja
- Plinska tehnika
- Pogonski i radni strojevi
- Procesno inženjerstvo
- Tehnički izmjenjivači topline
- Tehnika hlađenja
- Tehnika klimatizacije i automatska regulacija
- Termodinamika smjesa
- Termoenergetska postrojenja
- Toplinska mjerena
- Toplinske turbine

- Ship Systems
- Marine HVAC&R Systems
- Power plants
- Energy and process facilities
- Fuels, lubricants and water
- Environmental engineering
- Compressors
- Laboratory practice in Thermal Engineering
- Internal Combustion Engines
- Thermodynamics II
- Numerical Modelling in Thermodynamics
- Renewable Energy Sources
- Process Plants Equipment
- Gas Engineering
- Motive and Working Engines
- Process engineering
- Heat Exchangers
- Refrigeration
- Climatization technique and automatic control
- Thermodynamics of Mixtures
- Thermal energy plants
- Thermal Measurements
- Heat turbines

## KOLEGIJI NA PREDDIPLOMSKIM STRUČNIM STUDIJIMA

| UNDERGRADUATE VOCATIONAL COURSES



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- Brodski sustavi, pomoći strojevi i uređaji
- Energetika u procesnoj industriji
- Grijanje i klimatizacija
- Tehnološki procesi u procesnoj industriji
- Toplina
- Toplinski strojevi i uređaji 1
- Toplinski strojevi i uređaji 2
- Zaštita okoliša i radne sredine

- Ship Systems and Auxiliaries
- Energetics in process industry
- Heating and Air-Conditioning Systems
- Technological processes in process industry
- Thermodynamics
- Thermal machines and devices 1
- Thermal machines and devices 2
- Environmental and working space protection

## KOLEGIJI NA POSLIJEDIPLOMSKIM SVEUČILIŠNIM (DOKTORSKIM) STUDIJIMA

| POSTGRADUATE UNIVERSITY (DOCTORAL) COURSES

- Eksperimentalne metode u toplinskoj tehnici i termoenergetici
- IP iz motora s unutarnjim izgaranjem
- Izabrana poglavља iz brodskih energetskih postrojenja
- Izabrana poglavља iz brodskih strojnih kompleksa
- Izabrana poglavља iz grijanja i klimatizacije
- Izabrana poglavља iz izmjenjivača topline
- Izabrana poglavља iz tehnike hlađenja i tehnike niskih temperatura
- Izabrana poglavља iz toplinskih znanosti
- Numeričko modeliranje prijelaza topline
- Numeričko modeliranje procesa izgaranja
- Obnovljivi izvori energije
- Termodinamička analiza procesa
- Termodinamika smjesa i toplinski uređaji
- Zaštita okoliša u tehnici hlađenja

- Experimental Methods in Thermal and Power Engineering
- Selected chapters on Internal Combustion Engines
- Selected Topics Marine Energy Systems
- Selected Topics of Marine Machinery Systems
- Selected Topics on Heating and Air-Conditioning
- Selected Topics on Heat Exchangers
- Selected chapters on Refrigeration and Low Temperature Refrigeration
- Selected Topics on Thermal Sciences
- Numerical Modeling of Heat Transfer
- Numerical Modeling of the Combustion Process
- Renewable Energy Sources
- Thermodynamic Analysis of Processes
- Thermodynamics of Mixtures and Thermal Devices
- Environmental refrigeration

**ZNANSTVENOISTRAŽIVAČKI RAD | SCIENTIFIC RESEARCH**

- Istraživanja na toplinskim aparatima i uređajima, izmjenjivačima topline i toplinskim spremnicima koja obuhvaćaju teorijska i laboratorijska istraživanja prijelaza topline, prijenosa mase te izmjene topline pri promjeni faza; istraživanja i optimizacija sustava grijanja i klimatizacije te sustava za korištenje obnovljivih izvora energije; istraživanja na području rashladne tehnike koja obuhvaćaju kompresijske i apsorpcijske rashladne uređaje i dizalice topline; istraživanja u području energetske učinkovitosti i optimizacija termotehničkih sustava grijanja, hlađenja i klimatizacije; istraživanja utjecaja parametara vlažne pare na proces erozije rotorskih lopatica toplinskih turbina; istraživanja erozije korozije protočnog dijela parnih turbin; istraživanja mogućnosti smanjenja emisije štetnih tvari motora s unutarnjim izgaranjem uz zadržavanje niske specifične potrošnje goriva te s ciljem povećanja specifične snage i pouzdanosti u preuzimanju naglih opterećenja snage kod motora s prednabijanjem; istraživanja iz brodskog strojarstva s ciljem optimalnog i energetski racionalnog vođenja brodskih pogonskih sustava; istraživanja na području optimizacije energetskih procesa; istraživanja na području smanjenja emisija štetnih sastojaka iz energetskih i procesnih postrojenja.*  
Research on heat devices, heat exchangers and heat storages which encompass theoretical and laboratory research of heat and mass transfer, as well as heat transfer during phase change processes; research and optimization of heating and cooling systems, as well as of renewable energy systems; research into the field of refrigeration which embraces compression and absorption cooling devices and heat pumps; research into energy efficiency and optimization of HVAC&R systems; research into influence of wet steam parameters on the erosion process of rotor turbine blades; research into erosion - corrosion in the flowing part of steam turbines; research into reducing pollution species emission of internal combustion engines while retaining low specific fuel consumption and aiming at increasing specific power and reliability by sudden overload of a super charged engine; research to field of marine engineering aiming at the optimizing ships power plant control; investigation into optimization of energy processes; investigation into the field of emission reduction from energy and process facilities.
- Optimizacija energetskih sistema; Zaštita okoliša u energetskim postrojenjima*  
*Optimisation of energy systems; Environmental protection in energy plants*



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**PROJEKTI | PROJECTS**

- Pavković, B., Damjanović, J.: Izrada studije izvodivosti i idejnog projekta za instalaciju fotonaponske elektrane na rashladnom skladištu u okviru GreenBerth Projekta Rijeka, Hrvatska, podizvođač u IPA Med projektu: Promotion of Port Communities SMEs role in Energy Efficiency and GREEN Technologies for BERTHing Operations, Tehnički fakultet u Rijeci 2015., studija opravdanosti i idejni projekt*  
Pavković, B., Damjanović, J.: External Services for Development of Feasibility and Preliminary Design for Installing Photovoltaic Cells on Cold Storage Warehouse Within GreenBerth Project Rijeka, Croatia, subcontractor in IPA Med project: Promotion of Port Communities SMEs role in Energy Efficiency and GREEN Technologies for BERTHing Operations, Faculty of Engineering in Rijeka, 2015., feasibility study and preliminary design
- Pavković, B., Delač, B.: Projekt poboljšanja energetske učinkovitosti VII odjela bolnice za ortopediju i rehabilitaciju „Prim. dr. Martin Horvat“, Rovinj, 2015*  
Pavković, B., Delač, B.: Project of energy efficiency improvement for department VII of special hospital for orthopedics and rehabilitation „Prim. dr. Martin Horvat“, Rovinj, 2015
- Pavković, B., Lenič, K.: Nadogradnja računalnog programa KI Expert 2013, 2015*  
Pavković, B., Lenič, K.: Updating the computer program KI Expert 2013, 2015
- Medica, V., Mrakovčić, T., Mrzljak, V.: Generalni remont turbineskog otoka i retrofit NT turbine nazivne snage 210 MW - Izvješće o analizi toplinskih shema iz ponudbene dokumentacije*

Medica, V., Mrakovčić, T., Mrzljak, V.: General conversion of turbine island and retrofit of LP turbine with power of 210 MW - Report on the analysis of heat balance diagrams from the offered project documentation

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- Mrzljak, V., Mrakovčić, T., *Comparison of COGES and Diesel-Electric Ship Propulsion Systems* Pomorski zbornik, ISSN 0554-6397 (Tisak), Posebno izdanje No.1, 131-148, 2016, Rijeka
- Mrzljak, V., Medica, V., Mrakovčić, T. *SIMULATION OF DIESEL ENGINE CYLINDER PROCESS USING QUASI-DIMENSIONAL NUMERICAL MODEL*, Scientific Journal of Maritime Research ISSN 1332-0718 (Tisak), 29, No. 2, 165-169, 2015, Rijeka
- Bukovac, O., Medica, V., Mrzljak, V., *STEADY STATE PERFORMANCES ANALYSIS OF MODERN MARINE TWO-STROKE LOW SPEED DIESEL ENGINE USING MLP NEURAL NETWORK MODEL*, Brodogradnja : Teorija i praksa brodogradnje i pomorske tehnike, ISSN 0007-215X (Tisak), 66, No. 4, 57-70, 2015, Zagreb



- Mrzljak, V., Medica, V., Bukovac, O., *Simulation of a Two-Stroke Slow Speed Diesel Engine Using a Quasi-Dimensional Model*, *Transactions of FAMENA*, ISSN 1333-1124 (Tisak), 40, No. 2, 35-44, 2016, Zagreb

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- Janković, Z., Sieres Atienza, J., Cerdeira Perez, F., Pavković, B., *Steady-State Numerical Simulation of a Vapor Compression Heat Pump System as an Effective Method to Predict its Performance*, 16th International Refrigeration and Air Conditioning Conference at Purdue, 2016 Purdue, USA
- Franković, B., Blečić, P., Hustić, A., *Utjecaj uvođenja obnovljivih izvora energije na održivi razvoj energetskih sustava Republike Hrvatske s osvrtom na emisije stakleničkih plinova* 24. forum Hrvatskog Energetskog društva, CD, 2015, Zagreb
- Franković, B., Blečić, P., *Thermodynamics of Torpedo Propulsion Engines*, 7th International Industrial Heritage Conference, CD, 2016, Rijeka

#### MEĐUNARODNA SURADNJA | INTERNATIONAL COLLABORATIONS

- ASHRAE – American Society of Heating, Refrigerating and Air-Conditioning Engineers. California Institute of Technology, SAD / USA
- Dipartimento di fisica tecnica, Universita' degli studi di Padova, Italija / Italy
- Dipartimento di energetica, Universita' degli studi di Trieste, Italija / Italy
- Dipartimento di energetica, Politecnico di Milano, Italija / Italy
- EAEC – European Automobile Engineers Cooperations, Austrija / Austria
- Ente per le Nuove tecnologie, l'Energia e l'Ambiente, ENEA, Roma, Italija / Italy
- EURAMMON - a joint initiative by companies, institutions and individuals committed to increasing the use of natural refrigerants, Frankfurt, Njemačka / Germany
- Faculty of Chemistry and Chemical Engineering, University of Maribor, Slovenija / Slovenia
- Faculty of Mechanical Engineering, University of Ljubljana, Slovenija / Slovenia
- Faculty of Mechanical Engineering, University of Maribor Slovenija / Slovenia
- FH Joanneum, University of Applied Sciences, Graz, Austrija / Austria
- FISITA – International Federation of Automotive Engineering Societies, Ujedinjeno Kraljevstvo / United Kingdom
- GRETh, Bâtiment Lynx, SavoieTechnolac, Le Bourget du Lac – Cedex, Francuska / France
- Institute of Energy Technology, ETH Zürich, Švicarska / Switzerland
- Institut für angewandte Thermo- und Fluiddynamik, Fakultät Maschinenbau, Hochschule Mannheim, Njemačka / Germany
- Institute for Resource Efficient and Sustainable Systems, Graz University of Technology, Austrija



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/ Austria

- *International Institute of Refrigeration, Paris, Francuska, France*
- *ISES – The International Solar Energy Society, Freiburg, World Organisation, Germany / Njemačka ISES Europe Freiburg, Njemačka / Germany*
- *Laboratory for Heating, Sanitary and Solar Technology, University of Ljubljana, Slovenija / Slovenia*
- *REHVA - Federation of European Heating, Ventilation and Air Conditioning Associations, Brussels, Belgija / Belgium*
- *Research and Development Center, Compagnie Industrielle d'Aplications Thermiques (CIAT), Culoz Francuska / France*
- *Szent Istvan University, Gödollo, Mađarska / Hungary*
- *Universität in Kassel, Njemačka / Germany*



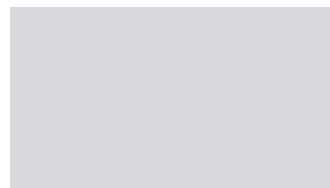


# 5.<sup>12</sup> akademici i profesori emeritusi academics and professors emeritus



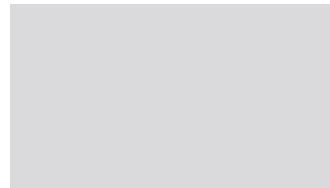
Ivan Katavić

*professor emeritus*  
*professor Emeritus*



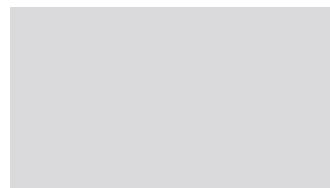
Elso Kuljanić

*professor emeritus, Akademik HAZU*  
*professor Emeritus, HAZU academician*



Špiro Milošević

*professor emeritus*  
*professor Emeritus*





# SLUŽBE

DEKANAT, TAJNIŠTVO

RAČUNALNI CENTAR

STUDENTSKA EVIDENCI

KNJIŽNICA

# 6 stručne službe professional and administrative staff



# 6.<sup>1</sup> knjižnica library



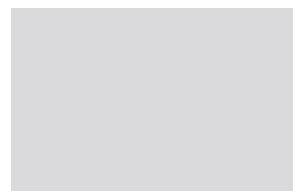
VODITELJICA | HEAD:

Prof. i dipl. knjižničarka / prof., grad. librarian **Marta Lončarević**

<http://www.riteh.uniri.hr/ustroj/knjiznica>



**Marta Lončarević** prof. i dipl. knjižničarka prof., grad. librarian



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**mr. sc. Mario Šlosar-Brnelić** dipl. knjižničar grad. librarian



Knjižnica Tehničkog fakulteta Sveučilišta u Rijeci dio je znanstvene, istraživačke i obrazovne djelatnosti Fakulteta. Obavlja poslove oblikovanja i izgradnje knjižničnog fonda (nabava, stručna obrada), pružanja knjižničnih usluga korisnicima (posudba i korištenje građe, informacijsko-edukacijsku djelatnost) te ostale poslove koji proizlaze iz tih procesa.

Korisnici knjižnice su redovni i izvanredni studenti, nastavno osoblje i stručni suradnici Fakulteta, ali i ostali članovi šire društvene zajednice koji se bave znanstvenim i stručnim radom, a usluge knjižnice koriste po posebnim uvjetima. Knjižnica funkcioniра kao informacijsko, izobrazbeno i komunikacijsko središte. Nalazi se u prizemlju zgrade Fakulteta, gdje su na 403 m<sup>2</sup>, na dvije etaže, smještene čitaonica, računalna čitaonica te otvoreni i zatvoreni fond.

The Library of the Faculty of Engineering, University of Rijeka is a part of the scientific, research and educational activities of the Faculty. It performs tasks of designing and construction of the library collection (procurement, expertise) the provision of library services to users (loan and the use of materials, information and educational activities) and other matters arising from these processes.

The Library is used by full and part-time students, faculty and professional staff of the Faculty but also by other members of the wider community engaged in scientific and professional work who use library facilities under special conditions. Therefore, the library functions as a media, education and communication center. It is located on the ground floor of the Faculty, namely on two floors covering 403 m<sup>2</sup> where there are situated a Reading Room, computer Reading Room, Open and Closed-End Fund.

Čitaonica se sastoji od trideset i tri mesta za učenje i korištenje prijenosnih računala s priključcima na mrežu. Računalna čitaonica ima dvadeset i četiri mesta s dvanaest računala namijenjenih istraživanju i učenju; preko njih studenti imaju pristup bazama podataka i katalozima svih knjižnica. Nedavnom modernizacijom knjižničnoga sustava, Knjižnica je integrirana u knjižnični sustav Sveučilišta u Rijeci, dodano je niz novih funkcionalnosti i usluga i omogućeno je pretraživanje svih baza kroz jedan sustav. Pomoću Discovery servisa, jedinstvenog sučelja za pretraživanje, omogućeno je pretraživanje skupnog kataloga Sveučilišta čime i u kataloga svih knjižnica Sveučilišta, preplaćenih baza podataka dostupnih na Fakultetu i Sveučilištu u Rijeci, portala znanstvenih časopisa RH HRČAK i drugih odabranih znanstvenih izvora u slobodnom pristupu na internetu. Knjižnica je uključena u projekt Centra za online baze podataka čime su znanstveni i stručni časopisi dostupni našim korisnicima.

Knjižnični fond Knjižnice je svojim sadržajem i obimom prilagođen znanstveno-istraživačkom programu rada na Fakultetu. Kontinuirano se dopunjava, obnavlja i osuvremeniuje pri čemu se težište stavlja na nabavu literature iz tehničkih znanosti, elektrotehnike, brodogradnje, računarstva. Početkom 2015. godine, knjižnični fond iznosi oko 22000 svezaka omeđenih publikacija te tridesetak naslova domaćih i stranih periodičkih publikacija. Uz klasičnu posudbu tiskane građe, pridaje se pažnja i pretraživanju i odabiru relevantne građe prema individualnim potrebama korisnika kao i njihovoj edukaciji za samostalno pretraživanje izvora informacija. Knjižnica, prema zahtjevima korisnika, vrši usluge i međuknjnične posudbe.

Uključeni smo u sustav upravljanja kvalitetom ISO 9001.

The Reading Room consists of thirty-three places for learning and using laptop computers with connections to the network. The Computer Reading Room has twenty four places with twelve computers intended for research and learning; through them, students have access to licensed databases and catalogs of all libraries. With recent modernization of the library system, the Library has been integrated into the library system of the University of Rijeka, a number of new features and services have been added and searches over databases through one system enabled. Using the Discovery Service as a unified search interface, it is now possible to search not only over the Union University Catalogue but also over the catalogs of all the libraries of the University, subscribed databases available on the Faculty and the University of Rijeka, the central portal of Croatian scientific journals named RH HRČAK and other selected scientific resources freely accessible on the Internet. The library is also included in the project of the Center for online databases making thus all scientific and professional journals available to our customers.

The library fund of the Library is in its funding sources, contents and scope adjusted to scientific research program at the Faculty. It has been continuously complementing, renewing and modernizing whereby the emphasis has been placed on the acquisition of literature in engineering sciences, electrical engineering, naval architecture and computing. In early 2015 the library fund covered about 22000 volumes of monographs and thirty titles of domestic and foreign periodicals. However, apart from lending the classic printed materials, due attention is also given to the search and selection of relevant material for individual search of sources of information according to the individual needs of users as well as their education. The Library provides services and interlibrary loans meeting thus the requirements of their users.

It is also worth pointing out that the Library and its members are involved in the quality management system ISO 9001 standard.



## 6.<sup>2</sup> računalni centar computer center



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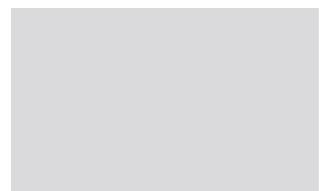
Tatjana Škorjanc, dipl. ing. graduate engineer

<http://www.riteh.uniri.hr/ustroj/rc/>



Tatjana Škorjanc, dipl. ing. graduate engineer

voditelj  
head

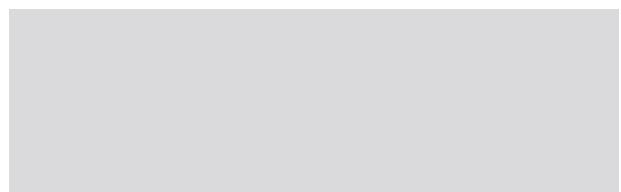


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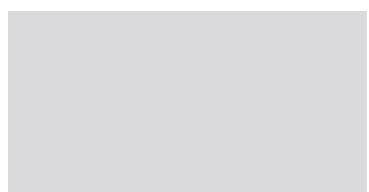
Siniša Vukotić

stručni suradnik  
associate



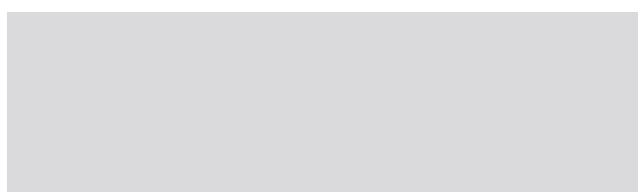
Domagoj Crljenko, dipl. ing. graduate engineer

stručni suradnik  
associate



Dario Maršanić, prof.

viši stručni suradnik  
senior associate

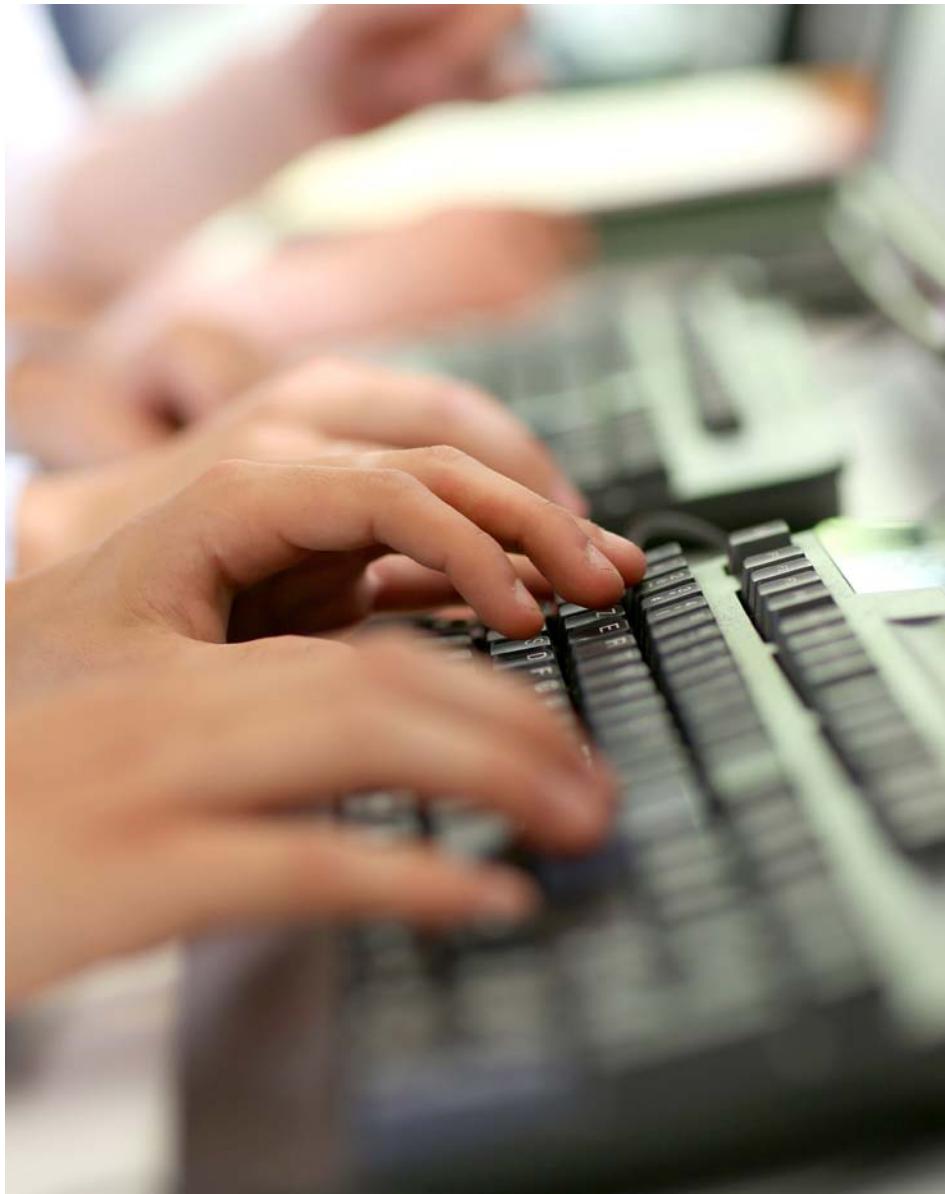


## RAČUNALNI KABINETI

- *Računalni kabinet 1: 20 + 1 računalo*
- *Računalni kabinet 2: 20 + 1 računalo*
- *Računalni kabinet 3: 20 + 1 računalo*
- *Računalni kabinet 4: 20 + 1 računalo*
- *Računalni kabinet 5: 10 računala*
- *Računalni kabinet 6: 10 računala*
- *Računalni kabinet 7: 20 + 1 računalo*
- *Računalni kabinet 8: 20 + 1 računalo*

## COMPUTER CLASSROOMS

- *Computer Classroom 1: 20 + 1 computers*
- *Computer Classroom 2: 20 + 1 computers*
- *Computer Classroom 3: 20 + 1 computers*
- *Computer Classroom 4: 20 + 1 computers*
- *Computer Classroom 5: 10 computers*
- *Computer Classroom 6: 10 computers*
- *Computer Classroom 7: 20 + 1 computers*
- *Computer Classroom 8: 20 + 1 computers*



## 6.<sup>3</sup> financijska služba accounting division



### VODITELJICA | HEAD:

Ana Mirković Pavlović, mag. oec. grad. economist

<http://www.riteh.uniri.hr/ustroj/strucne-službe/fs/>



Ana Mirković Pavlović, mag. oec. grad. economist

voditeljica  
head



Mirjana Mihaljević Vukelić, ing. bacc. eng.

voditeljica ostalih ustrojstvenih jedinica  
head of other organizational units



Karolina Kaštelan

financijski poslovi  
financial activities



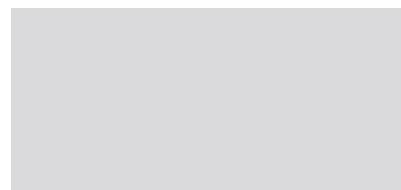
Iva Spajić, dipl. oec. grad. economist

financijski poslovi  
financial activities



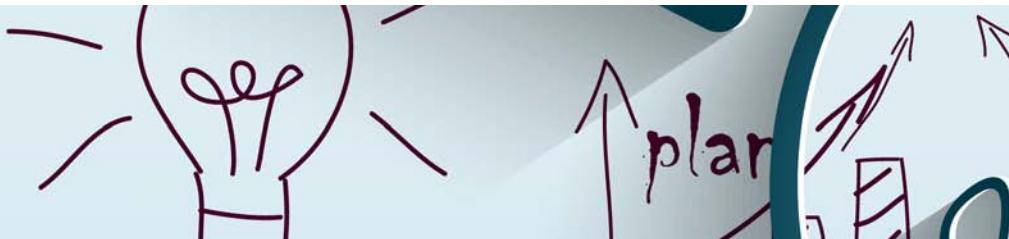
Ana Šutalo, struc. spec. oec. spec. grad. economist

financijski poslovi  
financial activities





## 6.<sup>4</sup> služba nabave i komercijale procurement and commerciale office



### VODITELJ | HEAD:

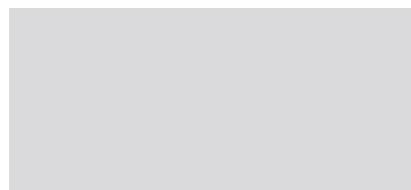
Robert Mohorić, dipl. oec. grad. economist

<http://www.riteh.uniri.hr/ustroj/strucne-službe/skn/>



Robert Mohorić, dipl. oec. grad. economist

voditelj  
head



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Bruna Martinović, oec. economist

ekonom za inventar  
inventory economist



Mladen Ostrogović

ekonom za potrošni materijal  
i prodaju publikacija  
economist for consumables  
and publications sales

Služba obavlja poslove komercijale, nabave i ekonomata. Vodi poslove u vezi nabave roba, usluga i radova, izradom plana nabave robe, usluga i radova za tekuću godinu, priprema i provodi postupke odabira godišnjih dobavljača, vodi evidenciju nabave male i velike vrijednosti, administrativno provodi postupke nabave prema Zakonu o javnoj nabavi, priprema dokumentaciju ovisno o načinu nabave, kontaktira s dobavljačima, sudjeluje u pripremanju odluka i prijedloga ugovora, pohranjuje cijelokupnu dokumentaciju o nabavi, preuzima naručenu robu, vodi evidenciju o sitnom inventaru, osnovnim sredstvima i potrošnom materijalu, radi na izradi, održavanju i unapređenju baza podataka Službe te održava i unapređuje sustav kontrole kvalitete u Službi.

This office performs commercial, procurement and economic services. It runs services connected with the procurement of goods and services, prepares and implements the procedures for the annual selection of suppliers, contracts with suppliers, receives ordered goods, keeps records of small inventories, basic resources and consumables, works on the office's databases and maintains and improves the system of quality control of its services.

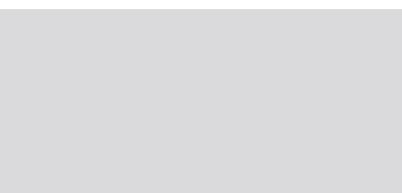
## 6.5 služba općih i kadrovskih poslova general and personnel office



### VODITELJICA | HEAD:

Lenka Štajduhar, oec. economist

<http://www.riteh.uniri.hr/ustroj/strucne-sluzbe/sokp/>



Lenka Štajduhar, oec. economist

voditeljica opće i kadrovske službe  
general and personnel office head



199

Lidija Petričić

administrativna tajnica  
administrative secretary



Snježana Mikuličić

voditeljica kadrovskih poslova  
personnel operation manager



### TAJNICE ZAVODA | DEPARTMENT SECRETARY:

Mira Bobanović



Vesna Franelić



Marijana Burić Redžović



Tijana Ćupurdija





Natalija Forgić



Lovorka Malinić



Dragica Jurin



Željka Dujić

**SPREMAČICE | CLEANING STAFF:**



Dragica Alempić



Marica Gnjatović



Lidija Antunović



Jasna Mijolović



Snježana Ban



Patricija Vukić



Mirjana Košpić



## 6.<sup>6</sup> služba studentske evidencije student's registrar and affairs office



VODITELJ | HEAD:

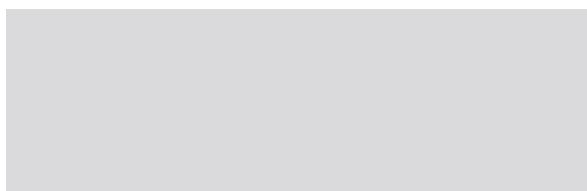
Žarko Burić, mag. ing.

<http://www.riteh.uniri.hr/ustroj/strucne-sluzbe/sse/>



Žarko Burić, mag. ing.

voditelj  
office head



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Ivona Balzani

voditelj odsjeka  
head of section



Antonela Ćaleta

voditelj ostalih ustrojstvenih jedinica  
head of other organizational units



Darko Vidučić

stručni savjetnik ISVU  
ISVU Advisor



Tanja Veljčić

administrativna tajnica  
administrative secretary

Služba studentske evidencije Fakulteta obavlja sve poslove vezane uz potrebe studenata. Zaprima i obrađuje dokumentaciju za razredbeni postupak, obavlja upis studnata u prvu i u više studijske godine, priprema dokumentaciju studenata za završni ili diplomski ispit, organizira promocije završenih studenata, prima i izdaje razne zahtjeve, uvjerenja i potvrde, izrađuje izvješća prostručne analize za potrebe Fakulteta te vodi potrebnu korespondenciju i daje izvješća zainteresiranim strankama.

The students' Registrars and Affairs Office is in charge of all the issues pertaining to students' needs. It collects and manages documentation for the admission exams, manages the enrolment of students to all the study years, prepares students' documents for the graduation exams, organizes the commencement of graduates, receives and delivers various requests and certificates, produces reports and analyses as per Faculty need, manages the necessary correspondence and gives reports to interested parties.



# 6.<sup>7</sup> tehnička služba technical and maintenance services



**VODITELJ | HEAD:**

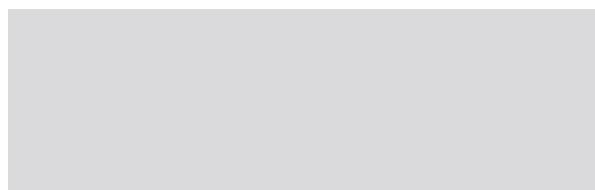
Nevio Poniš, dipl. ing.

<http://www.riteh.uniri.hr/ustroj/strucne-sluzbe/tehnicka-sluzba/>



**Nevio Poniš, dipl. ing.**

*voditelj*  
office head



**Bernardo Badurina**



**Goran Bakotić**



**Josip Jurasić**



**Andrej Miljuš**



**DOMAR - KUĆEPAZITELJI | MAJOR - DOMO**



**Štefan Racinger**



**Boris Šegota**

Tehnička služba obavlja poslove održavanja, zaštite na radu i zaštite od požara. U sastavu Tehničke službe su i laboranti koji pod nadzorom nastavnika sudjeluju u pripremi, odnosno izvedbi dijela nastave.

The Technical and Maintenance Services perform activities pertaining to maintenance, work safety and fire protection. Involved in the Technical Services are also laboratory technicians that, under supervision of teaching staff, participate in the preparation of performing parts of lectures.

## 6.<sup>8</sup> uredi za IPA projekte IPA project offices

Sandra Anić-Brklijača

projekt administrator  
project admin



Vedran Margan

projekt administrator  
project admin



Nadija Surać

projekt administrator  
project admin



Jelena Višnić

projekt administrator  
project admin



## 6.<sup>9</sup> hamag-bicro projekti hamag-bicro projects

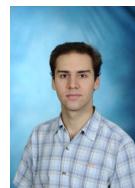
Guruprasad Madhale Jadav

istraživač  
researcher



Nino Miškić-Pletenac

istraživač  
researcher



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# 7 studentske aktivnosti student activities



## 7.1 studentski zbor tehničkog fakulteta student council at the faculty of engineering



Studentski zbor je najviše predstavničko tijelo studenta unutar Fakulteta čiji je rad definiran Statutom. Broj 15 članova predstavnika i isto toliko zamjenika koji se biraju u pet izbornih jedinica. Prema Statutu Fakulteta i drugim općim aktima, Studentski zbor izabire 14 predstavnika koji aktivno sudjeluju pri radu Fakultetskog vijeća Tehničkog fakulteta. Članovi Studentskoga zbora kroz odbore i povjerenstva sudjeluju u kreiranju politike Fakulteta.

Studentski zbor dužan je braniti interese studenata, upozoravati na nepravilnosti i nepravde te sufinancirati i podržavati rad studentskih udruga i organizacija na Fakultetu. Sufinanciran od strane Fakulteta i Sveučilišta u Rijeci i u okviru svojih mogućnosti, Studentski zbor raspolaze određenim sredstvima predviđenim za sudjelovanje u troškovima studentskih projekata te za rad njihovih udruga i organizacija. Preko svojega ovlaštenoga predstavnika aktivno sudjeluje i u tijelima odlučivanja unutar Sveučilišnog zbora Sveučilišta u Rijeci.

Tijekom ove akademske godine proveli smo nekoliko stručnih ekskurzija: posjetili smo Tehnički muzej u Munchenu, muzej BMW-a, tvornicu Rimac, tvornicu DOK-ING, Zagrebački inkubator poduzetništva, itd. Ponovo smo pokrenuli tradiciju odlaska studenata Tehničkog fakulteta na "ijade": tako smo ove godine otišli na Elektrijadu koja se održavala u Rimini, u Italiji, i ostvarili solidan rezultat u znanju i sportu. Također smo organizirali i "Dan sporta" u suorganizaciji s RSSS i tako obilježili završetak UNI SPORT lige u kojoj smo, nakon dugo godina, osvojili pokal u sveukupnoj konkurenciji, na što smo izuzetno ponosni.

The Student Council is the highest representative body of the students on the Faculty whose work is defined by the Statute. It counts 15 representatives and 15 deputies who are electing in 5 constituencies. According to Statue of the Faculty and other regulations, Student Council is choosing 14 representatives who are active in work of Student Council of the Faculty of engineering. Members, through different boards and commissions, are involved in creating Faculty's politics.

Student Council must defend students' interest, warn on irregularities and injustices, and co-finance and support work of student associations and organizations on the Faculty. Within their possibilities and co-financing from the Faculty and University of Rijeka, it's having certain financial support provided for student projects and for work of their organizations and associations. Through their in-charge member, they are also actively involved in deciding within Student Council of University of Rijeka.

During this academic year, we were on few field trip so we visited technical Museum in Munich, BMWs museum, Rimac factory, DOK-ING factory, Zagreb incubator of entrepreneurship and others. We have started again trips to Elektrijada, a tradition of technical faculties. This year it was in Rimini, Italy where we achieved solid results in sports and knowledge competitions.

We have also organised „Dan sporta“ with collaboration with RŠSS in which we marked finish of UNI SPORT league in which we, after many years, took the trophy in overall competition and we are very proud of it.



Studentski zbor aktivno sudjeluje u radu tijela Fakulteta i Sveučilišta u Rijeci. Predstavnik Studentskog zbora Tehničkog fakulteta pri Studentskom zboru Sveučilišta bio je Šimun Rogoznica, a zamjenica Teodora Milošević.

Ove akademske godine imali smo studentske izbore gdje smo izabrali nove predstavnike u Studentski zbor.

Student council is activly involved in work of Faculty and University of Rijeka. A representative of Student council of Faculty of engineering and University of Rijeka, was Šimun Rogoznica and his deputie Teodora Milošević.

This academic year were held new student elections where has been choosen new representatives.

## članovi studentskog zbora po izbornim jedinicama members, listed by electoral wards

### 1. PREDIPLOMSKI SVEUČILIŠNI STUDIJ STROJARSTVA I BRODOGRADNJE

#### 1. UNDERGRADUATE UNIVERSITY STUDY OF MECHANICAL ENGINEERING AND NAVAL ARCHITECTURE

- *Grigor Dumbović*
- *Ivan Golik*
- *Marko Mesarić*
- *Marin Smilović*

### 2. PREDIPLOMSKI SVEUČILIŠNI STUDIJ ELEKTROTEHNIKE I RAČUNARSTVA

#### 2. UNDERGRADUATE UNIVERSITY STUDY OF ELECTRICAL ENGINEERING AND COMPUTER ENGINEERING

- *Denis Mijolović*
- *Endi Miletić*
- *Gordan Nekić*
- *Ivana Žužić*



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### 4. DIPLOMSKI SVEUČILIŠNI STUDIJ STROJARSTVA I BRODOGRADNJE

#### 4. GRADUATE UNIVERSITY STUDY OF MECHANICAL ENGINEERING AND NAVAL ARCHITECTURE

- *Luka Bukvić*
- *Ivana Gašpert*
- *Šimun Rogoznica*

### 5. DIPLOMSKI SVEUČILIŠNI STUDIJ ELEKTROTEHNIKE I RAČUNARSTVA

#### 5. GRADUATE UNIVERSITY STUDY OF ELECTRICAL ENGINEERING AND COMPUTER ENGINEERING

- *Franko Hržić*
- *Domagoj Poljančić*

### 6. POSLIJEDIPLOMSKI SVEUČILIŠNI (DOKTORSKI) STUDIJ

#### 6. POSTGRADUATE UNIVERSITY (DOCTORAL) STUDY

- *Damjan Banić*
- *Diego Sušanj*



## 7.2 ieee sb rijeka



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IEEE, Institute of Electrical Engineers, je stručna neprofitna organizacija koja djeluje širom svijeta. Udruga je nastala 1884. godine na inicijativu nekoljicine znanstvenika radi praćenja razvoja elektrotehnike te je prerasla u najveću svjetsku stručnu udrugu s više od 425 tisuća članova.

Posredstvom svojih članova IEEE je vodeći autoritet na širokom tehničkom području, od računalnih znanosti, biomedicinske tehnologije i telekomunikacija, preko električne energije, potrošačke elektronike te mnogih drugih područja. Svojom djelatnošću IEEE nastoji poticati, organizirati i pomagati tehničke aktivnosti širom svijeta.

Riječki studentski ogranak IEEE trenutno okuplja tridesetak studentskih članova koji sudjeluju na raznim državnim i međunarodnim događajima i daju svoj doprinos u organizaciji raznih događanja u riječkom području.

### 5. kongres IEEE Studentskih ogranaaka

Krajem rujna prošle godine, u organizaciji studentskog ogranka iz Osjeka, održan je 5. CroSYP (Croatian Student and Young Professionals Congress) na kojem su se okupili predstavnici svih četiriju hrvatskih ogranaaka. Samom kongresu prisustvovali su i članovi

IEEE, the Institute of Electrical Engineers, is a professional non-profit organisation active worldwide. The association, which was established in 1884 at the initiative of several scientists with the aim of monitoring the development of electrical engineering, has grown into the world's largest professional association with more than 425,000 members.

Through its members, the IEEE is a leading authority in wide technical areas ranging from computer science, biomedical technology and telecommunications, electrical energy to consumer electronics and several other fields. With its activity the IEEE aims to encourage, organise and assist technical activities worldwide.

The Rijeka IEEE student branch currently comprises about thirty student members participating in various national and international events, thus giving their contribution to the organisation of different events in the area of Rijeka.

### 5th IEEE STUDENT BRANCH CONGRESS

In late September last year, the student branch in Osijek organised the 5th CroSYP (Croatian Student and Young Professionals Congress), which brought together representatives from all four Croatian branches. The members of Rijeka



studentskog ogranka Rijeka koji su, obogaćeni za jedno novo iskustvo i potaknuti novim idejama, pokrenuli projekt Success Stories.

#### **IEEE success stories**

Po prvi put naši članovi organizirali su, u suradnji s Alumni klubom Tehničkog fakulteta u Rijeci, tri predavanja u sklopu IEEE success stories. Cilj spomenutih predavanja bio je približiti industriju Rijeke fakultetu, a studentima dati priliku upoznati i poslušati uspješne pojedince iz struke te im postavljati pitanja.

Prvo predavanje održao je prof. dr. sc. Branimir Ružojočić, vlasnik tvrtke TEMA d.o.o., drugo predavanje dipl. ing. brodogradnje Siniša Reljić, osnivač i direktor tvrtke Navis Consult d.o.o., a treće predavanje dipl. ing. el. Boris Popović, predsjednik upravne tvrtke Alarm Automatika d.o.o.. Odaziv studenata na sva tri predavanja bio je velik, a zadovoljstvo odslušanim još veće.

#### **Pripravni seminar iz programiranja**

Prošle godine po drugi put održan je pripravni seminar iz programiranja za studente prve godine prediplomskog sveučilišnog studija računarstva. Seminar su održali volonteri ogranka te kroz četiri dana obradili osnove programiranja u programskom jeziku C. Odazvala se polovina studenata upisanih u prvu godinu, što je i više nego zadovoljavajuće. Također, u sklopu seminara održane su prezentacije laboratorija koji djeluju na Tehničkom fakultetu u Rijeci kao i udruga usko vezanih uz računarstvo. Ove godine

SB, who also took part at the Congress, used the experience and new ideas gained at it to start their Success Stories Project.

#### **IEEE SUCCESS STORIES**

For the first time, our members organised in collaboration with the Alumni Club of the Faculty of Engineering in Rijeka three lectures as part of the IEEE Success Stories. The purpose of these lectures was to present Rijeka's industry to Faculty members and give students the opportunity to meet and listen to successful members from the professional field as well as ask them further questions.

The first lecture was held by Prof D.Sc. Branimir Ružojočić, owner of TEMA d.o.o., followed by Siniša Reljić, B.S. in Naval Architecture, founder and director of Navis Consult d.o.o., and Boris Popović, B.S. in Electrical Engineering, chairman of Alarm Automatika d.o.o. Students attended the guest lectures in large numbers and with lively interest.

#### **INTRODUCTORY PROGRAMMING SEMINAR**

Last year, an introductory programming seminar was organised for the second time for the first-year students of the undergraduate university study of computer engineering. The seminar was held by branch volunteers, who covered the basics in C Programming Language. More than half of the students enrolled in the first year attended, which is more than satisfactory. Moreover, laboratories of the Faculty of



pripravni seminar iz programiranja proširen je na sve studije Tehničkog fakulteta u Rijeci.

### MIPRO konferencija

Naši su članovi volontirali na promociji udruge i fakulteta na konferenciji MIPRO koja se svake godine održava u Opatiji. Konferencija je prvenstveno namijenjena informacijskim i komunikacijskim tehnologijama te sadržava i promociju studentskih radova iz istih područja.

### IEEE day

Kao i svake godine, studenti IEEE ogranka Rijeka su u sklopu proslave svoga dana, 6. listopada, nastojali informirati studente o IEEE udruzi. Tako su u holi fakulteta postavili štand s promotivnim materijalom i pružili zainteresiranim informacije o radu udruge, a oni koji su se htjeli učlaniti, mogli su to učiniti odmah.

### ZEC – Zagreb Energy Conference

Sredinom prosinca prošle godine održana je konferencija o energetici na kojoj su sudjelovali članovi naše sekcije. Prvi dan prošao je u vrlo zanimljivim predavanjima posvećenim povijesti energetike u Hrvatskoj te budućnosti energije tj. obnovljivim izvorima energije, dok su drugi i dan bile organizirane posjete hrvatskim elektranama.

### IEEE Region 8 Student and Young Professionals Congress

Od 17. 8. - 21. 8. održan je kongres u Regensburgu (Njemačka) koji je okupio oko 450 članova IEEE iz Europe, Afrike i Bliskog istoka. Kroz veliki broj radionica i posjeta raznim uspješnim firmama, sudionici kongresa dobili su smjernice kako voditi svoje ogranke IEEE-ja te kako unaprijediti svoju regiju. Između desetak članova Hrvatske sekcije IEEE bili su i pripadnici IEEE Studentskog ogranka Rijeke.

Engineering in Rijeka were presented as well as associations closely related to computer engineering. This year, however, the introductory programming seminar is offered to students of all study programmes of the Faculty of Engineering.

### MIPRO CONFERENCE

Our members volunteered at the promotion of the Association and Faculty at the MIPRO Conference, which is held in Opatija every year. The Conference is primarily focused on information and communication technologies but also on promoting student works from these fields.

### IEEE DAY

On 6 October, as part of the celebration of the IEEE Day, Rijeka IEEE SB members informed their peers about the IEEE association. They set up a stand with promotive material and gave information about the activity of the association. There was the possibility for those interested to join the association on the spot.

### ZEC-ZAGREB ENERGY CONFERENCE

In mid- December last year, Energy Conference was held, at which members of our section also participated. The first day was dedicated to interesting lectures on the history of energy engineering in Croatia and the future of energy, namely renewable energy sources, while the second day was spent on organised visits to Croatian power plants.

### IEEE REGION & STUDENT AND YOUNG PROFESSIONALS CONGRESS

On 17-21 August 2016, the Congress was held in Regensburg (Germany), attended by about 450 IEEE members from Europe, Africa and the Near East. Numerous workshops and visits to various successful companies were organised, where the participants of the Congress were given guidelines for organising their respective IEEE branches and developing their region. Rijeka IEEE SB members attended the Congress together with other Croatian IEEE section members.



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## 7.3 iaeste

### IAESTE HRVATSKA *new experience today, new expert tomorrow*



IAESTE (The International Association for the Exchange of Students for Technical Experience) najveća je svjetska udruga za razmjenu studenata tehničkih i prirodnih znanosti. Udruga je utemeljena 1948. godine na Imperial College of London i danas organizirano djeluje u više od 90 zemalja diljem svijeta. U Hrvatskoj djeluje još od 1952. godine, a od 1992. g. kao međunarodna udruga za razmjenu stručnih praksi tehničkih i prirodnih znanosti IAESTE Croatia.

Udruga već godinama uspješno djeluje i na Sveučilištu u Rijeci i to zahvaljujući volonterskom radu svojih članova. Od osnivanja 1952. godine, više od 1400 hrvatskih studenata dobilo je priliku svoju stručnu praksu odraditi u inozemstvu, dok je u Hrvatsku na stručnu praksu primljeno više od 1300 studenata iz cijelog svijeta.

Posljednjih desetak godina više od 400 studenata hrvatskih sveučilišta dobilo je priliku otici na stručnu praksu u inozemstvo posredstvom udruge IAESTE, od čega više od 60 studenata Tehničkog fakulteta Sveučilišta u Rijeci. Naši su studenti na stručnom usavršavanju bili u Portugalu, Njemačkoj, Mađarskoj, Velikoj Britaniji, Nizozemskoj, Grčkoj, Finskoj, Kazahstanu, Indiji, Japanu, Švedskoj, itd. Pružena im je prilika vidjeti i upoznati nove zemlje i kulture te stjecati ne samo praktična životna iskustva, već i prijateljstva.

U istom je razdoblju lokalni odbor Rijeka ugostio više od 20 stranih studenata koji su na stručnom usavršavanju boravili na riječkom području. Za strane i naše studente svakoga se ljeta organiziraju druženja i putovanja pod nazivom GETT (Get together days). Studenti Tehničkog fakulteta, članovi udruge, također su aktivni sudionici mnogobrojnih međunarodnih susreta, kongresa i seminarâ.

IAESTE (The International Association for the Exchange of Students for Technical Experience) is the biggest international association for exchanging students from technical and natural science. It was established in 1948 on Imperial College of London and today it is active in more than 90 states all around the world. In Croatia it is working since 1952, and since 1992 it is like international association for exchanging for professional practice of technical and natural science IAESTE Croatia.

The association is succesfully working in University of Rijeka and thanks to students volunteering. Since 1952 more than 1400 croatian students had a chance to do their professional practice outside Croatia, while here, in Croatia, came more than 1300 students from all around the world.

In last 10 years, more than 400 students have got a chance to go do thier professional practice under the support of IAESTE, of which more than 60 students were from our Faculty. Our students were in Portugal, Germany, Hungary, Great Britain, Netherlands, Greece, Finland, Kazakhstan, India, Japan, Sweden etc. They had a chance to see and meet not just new countries and cultures, but practical life experience and friendships.

During that same period, the local board Rijeka has hosted more than 20 foreign students who were on their practice here in Rijeka. For foreign and domestic students, every summer is organizing hanging arounds and trips under the name GETT (Get together days). Students from Faculty of engineering, associations' members are also active in many international meetings, congress and seminars.



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## 7.4 elektrijada

RITEH ELEKTRIJADA je projekt koji je omogućio studentima Tehničkog fakulteta njihovo prvo sudjelovanje na Elektrijadi, a sudjelovao je ukupno 31 student. Elektrijada je međunarodno okupljanje studenata tehničkih znanosti u sklopu koje se odvijaju brojna natjecanja u znanju i sportu te popratne zabavne aktivnosti. Ovogodišnje okupljanje održalo se u Italiji, u Riminiju, od 12.05. do 17.05.

Realizacija projekta započela je 12.05. u ranim jutarnjim satima kada se iz Rijeke krenulo za Rimini. Studenti Tehničkog fakulteta pokazali su izuzetan trud i dobre uspjehe u raznim sportskim disciplinama poput rukometa, veslanja, crossa, nogometu, i sl., a sudjelovali su i u natjecanjima u znanju. Popratno su se, uz službeni dio natjecanja, odvijale razne zabavne aktivnosti gdje su naši studenti upoznali studente iz raznih zemalja regije. Na povratku je izdvojeno par sati za posjetu San Marinu.

Ovim projektom pozicionira se matični fakultet u odnosu na ostale fakultete. Interakcijom studenata razmjenjuju se iskustva o načinu studiranja i rada i sudjelovanja u projektima na raznim fakultetima. Povratne informacije projekta i sva prikupljena saznanja mogu služiti kao temelj za daljnja poboljšanja na fakultetu. Ovim projektom povećava se broj studenata koji su aktivni u razvoju studentske zajednice.

Zahvaljujemo se svima koji su nam ustupili svoje vrijeme i pružili pomoć pri realizaciji ovog projekta. Pripreme za sljedeću godinu već su u tijeku. Očekuje se sudjelovanje većeg broja studenata i djelatnika Fakulteta te značajniji rezultati.

RITEH ELEKTRIJADA is a project on which 31 student from Faculty of engineering went this year for the first time. Elektrijada is an international gathering of students of technical sciences and on it are held numerous competitions in knowledge and sports just like other fun activity. This year it was in Rimini, Italy from 12.5.-17.5.

The realization of this project started on 12.5. in early hours from Rijeka. The students from Faculty of engineering showed exceptional willing and good successes in different sport disciplines like handball, rowing, cross, football etc., and they were also competing in knowledge competitions. During the official part of competition, there were all kinds of fun activities where our students have met students from other states from region. On the way back home, it was separated few hours to visit San Marino.

With this project, our Faculty is comparing with other Faculties . With students interaction , experiences of the way of studying and working are exchanging just like participating in projects at various faculties. The feedback of the project and all collected informations can be used as a base to the future improvements on Faculty. With this project, the number of students who are active in development of student community, is rising.

Here we would like to say Thank You to everyone who gave us their time and give help so we could realize this project. The preparations for the next year are in progress. It is expected to be more students involved just like better results.







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## 7.5 riteh racing team

Sezona 2015. / 2016. za Riteh Racing Team bila je i više nego produktivna i uspješna. RRT je u ovoj sezoni i dalje predvođen prof. dr. sc. Sanjinom Brautom i novim voditeljima tima, Matijom Prprovićem i Denisom Lončarom. Riteh Racing Teamu priključili su se i studenti ostalih fakulteta čime su dokazali kako je suradnja između različitih područja poput ekonomije, prava i strojarstva potrebna u ovakovom projektu.

Članovi RRT-a su marljivo projektirali peti bolid konceptnog naziva „Phoenix“, odnosno RRC4. RRC4 je brži, inovativniji i uspješniji od svojih prethodnika. Noviteti su aerodinamički paket, uspješno realiziran prvi put u povijesti tima, i zamjena čeličnih dijelova dijelovima od ugljičnih vlakana. RRC4 karakterizira i njegova snaga u odnosu na prethodnike. Ubrzanje od 3 sekunde do 100 km/h može ga okarakterizirati najsnajnijim bolidom izrađen u RRT-u. Članovi RRT-a su na rad bolidu utrošili preko 2000 sati napornog rada kako bi sami osmislili, konstruirali i dizajnirali više od 1000 dijelova od kojih se bolid sastoji.

Riteh Racing Team je s RRC4 nastupio na natjecanju FS Hungary te ostvario najbolje rezultate u povijesti tima! U ukupnom poretku, RRC4 je zauzeo 23. mjesto dok je u najzahtjevnoj kategoriji, utrci izdržljivosti, zauzeo 17. mjesto. Odličnim rezultatima RRT se predstavio u najboljem svjetlu na ovom prestižnom i cijenjenom automotu natjecanju podržanom od strane Instituta inženjera strojarstva.

RRT odlično surađuje i s ostalim projektima studenata Sveučilišta u Rijeci poput Onetiusa, Bure znanja i Urban Junglea 2. Međusobna razmjena znanja i iskustva nastavit će se i u narednoj sezoni. Također, RRT su i u ovoj sezoni prepoznali i podržali Tehnički fakultet Sveučilišta u Rijeci, Sveučilište u Rijeci, Studentski zbor Sveučilišta u Rijeci te mnogobrojni sponzori poput AVL-a, Rimac Automobili, DOK-ING-a, INA-e i Zagrebačke banke, bez kojih se projekt ne bi mogao realizirati.

RRT i u sezoni 2016. / 2017. nastavlja s radom kojega možete pratiti na društvenim mrežama poput Facebooka, Instagrama, Twiterra i Youtbea, te na službenoj stranici [www.ritehracingteam.uniri.hr](http://www.ritehracingteam.uniri.hr).

The 2015/2016 season was more than productive and successful for the Riteh Racing Team, which has continued to be led by Prof. D. Sc. Sanjin Braut, accompanied by the new team leaders Matija Prprović and Denis Lončar. Students from other faculties also joined the Riteh Racing Team, thus proving that collaboration among different fields such as economics, law and mechanical engineering is much needed in projects of this kind.

Members of the RRT have diligently designed the fifth car named "Phoenix" or RRC4, which is faster, more innovative and successful than its predecessors. The novelties comprise the aerodynamic package, successfully realised for the first time in the history of the team, and the replacement of steel parts with those made from carbon fibre.

The RR4 is more powerful and faster than its predecessors, which is confirmed by the acceleration of 100 km/h within 3 seconds. Members of the RRT have invested more than 2000 hours of hard work in conception, design and construction of over 1000 parts.

The RRT participated with the RRC4 at the FS Hungary competition, achieving the best results in the history of the team! As for the overall placement, the RRC4 took 23rd place while in the most demanding category, the endurance race, it finished in 17th position. With these excellent results, the RRT presented itself in the best light at this prestigious and respected automotive competition, which is supported by the Institute of Mechanical Engineers.

The RRT has established excellent collaboration with other projects of Rijeka University students like Onetius, Bura znanja and Urban Jungle 2. This mutual exchange of knowledge and experience will continue in the next season. Moreover, this season again the RRT was recognized and supported by the Faculty of Engineering of Rijeka University, by the Student Council of Rijeka University as well as by many sponsors like AVL, Rimac Automobili, DOK-ING, INA, Zagrebačka banka. Needless to say, without their support, this project could not have been realised.

The RRT will continue with its work in the 2016/2017 season; their further work can be followed on social networks like Facebook, Instagram, Twitter and YouTube, and on the official webpage [www.ritehracingteam.uniri.hr](http://www.ritehracingteam.uniri.hr).



FO  
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18TH.



# FORMULA STUDENT UNGARY

BAR - GÖNYÜ HARBOR  
19-21<sup>ST</sup> OF AUGUST, 2016

KNOR



7.5 riteh racing team

## 7.6 riteh waterbike team

RITEH Waterbike Team (RWT) osnovala je grupa studenata brodogradnje Tehničkog fakulteta u Rijeci 1999. g., radi sudjelovanja na International Waterbike Regatta (IWR). Prva regata je održana 1980. godine u Hannoveru. Isprva je to bio skup studenata s raznih njemačkih sveučilišta te viših škola koji su svoje druženje nastojali upotpuniti natjecanjem u granama znanosti i tehnologijama koje najbolje poznaju. Time započinju prva natjecanja plovila na nožni pogon. Uključivanjem sveučilišta iz Nizozemske, regata poprima internacionalni karakter pa je 1988. godine održana prva regata izvan granica Njemačke.

### Vodocikl (engl. Waterbike)

Plovilo je pokretano isključivo snagom ljudskih mišića dvije osobe. Prema pravilima IWR, vodocikli ne smiju biti duži od šest metara, širina im ne smije biti veća od dužine, gaz ne smije prelaziti 1,5 metara i ne smiju se koristiti elektronička pomagala na pogonu. Pobjednik natjecanja je plovilo koji skupi najmanje negativnih bodova u sedam disciplina:

- sprint 100 m,
- slalom 100 m,
- ubrzanje 10 m,
- naprijed - stop - natrag 50 m,
- maraton (1 h),
- vuča o stup na kojoj se mjeri prosječna vrijednost sile koju može proizvesti brodski vijak na vodociklu u periodu od 30 sekundi,
- utrka iznenađenja (ne boduje se za ukupni poredak, osim u slučaju istog broja bodova)

Na plovilu su moguće korekcije i izmjene dijelova između disciplina. Svi dijelovi korišteni na početku natjecanja fizički moraju ostati na vodociklu do završetka svih disciplina.

Područje rada RWT usko je vezano za tehničku struku (strojarstvo i brodogradnja), ekološki prihvatljive tehnologije i promociju zdravog života studenata. RWT je najstariji i najtrofejniji studentski tim na Tehničkom fakultetu kroz koji je prošlo više desetaka studenata, danas uspješnih inženjera i uglednih ljudi iz brodograđevne i strojarske struke. RWT se bavi projektiranjem i izradom vodocikala. To je inovativno i ekološki prihvatljivo plovilo pokretano snagom ljudskih mišića najviše dvojice natjecatelja. Studenti moraju projektirati i izraditi plovilo na fakultetu uz rukovođenje mentora i voditelja tima, počevši od razvijka koncepta vodocikla, preko njegove

RITEH Waterbike Team (RWT) was founded in 1999 by the group of students of Naval Architecture at the Faculty of Engineering in Rijeka with a goal to participate in International Waterbike Regatta (IWR). The first regatta was held in Hannover in 1980. At first, it was a crew of students from different German universities and colleges who tried to fulfill their needs for socializing by competing in various fields of science and technology in which they were the experts. That is how their first waterbike pedal competitions started.. This regatta became international when the Dutch students, namely students from the universities in the Netherlands, participated. It was only in 1988 that the first regatta was held outside of Germany.

### Waterbike

It is a vessel driven only by the human force of two people. According to the rules of IWR, waterbikes cannot be longer than 6 meters, wider than its length and sea gauge should not exceed more than 1,5 meters. Also, allowed no electronical gadgets are allowed. The winner of a competition is a vessel with the minimum of negative points in seven disciplines:

- -sprint 100 m
- -slalom 100 m
- -acceleration 10 m
- -back-forth-back 50 m
- -marathon (1 h)
- -the traction force acting on the pillar on which the average value of the force made by the propeller mounted on waterbike must be measured in 30 seconds
- -surprise race (no points unless there are teams with the same points)

According to need and disciplines, some corrections and changes of parts may be introduced on the vessel. However, all the parts that were used at the beginning of the competition must remain on the waterbike until all disciplines have been completed.

The working field of RWT is closely related with engineering professions (mechanical engineering and naval architecture), environmentally friendly technology and promotion of a healthy life of a student. RWT is the oldest and most trophies student team at the Faculty of Engineering in Rijeka and dozens of students have passed through it. Today



izrade i naposlijetku samog natjecanja, a sve to uz racionalno korištenje finansijskih sredstava te organizaciju cijelokupnog projekta. Ne postoje stroga pravila o izgledu vodocikla, stoga su izvedbe inovativne i ovise o znanju, tehničkim mogućnostima i spremnosti ekipe.

Radeći na projektu vodocikla, studenti praktično primjenjuju teorijska znanja stečena na fakultetu. Kako bi se kvalitetno pristupilo projektu izrade vodocikla, primjenjuju se integralna brodograđevna znanja poput plovnosti i stabilite, hidrodinamike i konstrukcije plovila. Rad u timu isključivo je volonterskog karaktera, a sredstva za rad studenti prikupljaju samostalno, traženjem sponsorstava i donacija. Pored toga, studenti se uče vještina organizacije, financija, marketinga, logistike i timskog rada, važnih pri budućem zapošljavanju.

Kroz povijest su izgrađena četiri vodocikla, Esmeralda, Zvizda, Kajzer i Šijun. Posljednji je ostvario najznačajnije rezultate kroz kratku povijest tima. U nastavku je prikazan razvoj i napredak vodocikala kroz povijest.

they are successful engineers and prominent people from the fields of naval architecture, shipbuilding and mechanical engineering. RWT is currently projecting and making waterbikes. These innovative and eco friendly vessels are driven only by the force of human muscles of two competitors. Students must do all that work with the help and leadership from a mentor and team leader, starting from design concept of a waterbike, through its building and, at the end, competition. All that must be done with rational and viable finance and entire organisation of competition. There are no strict rules for good appearance of a waterbike so that performances are innovative and depend on knowledge, technical possibilities and team readiness. When working on a waterbike project, students apply theoretical knowledge acquired from college courses. In order to design the project with high quality, there must be a wide range of integrated naval architecture and shipbuilding skills applied such as navigation, hydrostatics, hydrodynamics and the construction of a vessel. The member of a team works exclusively on the voluntary basis, so all the time, students are finding sponsors and donations for work all by themselves. Besides, students acquire skills needed for organisation, financing, marketing, logistics and team work, which are very important for the future business.

Throughout the team's existence a lot of improvements have been made and in such a short period of time the team has constructed four waterbikes: Esmeralda, Zvizda, Kajser and Šijun. The last one achieved the best results ever. Shown below is the development and progress of waterbikes throughout their history.



### Vodocikl - Šijun (tornado, pijavica)

Godina gradnje: 2013.

Trupovi: karbon – aramid, staklena vlakna

Konstrukcija: aluminijска konstrukција s nosačima.

Pogon i propulzija: azipodni propulzor (pedale i lanci za bicikle - prijenos na poluosovine, ulaz u multiplikator - mehanički prijenosnik - kardansko vratilo - kutni prijenosnici – brodski vijak)

Duljina: 5,10 m / Širina: 2,10 m / Masa: 38 kg / Gaz: 0,12 m

Maksimalna brzina: 9 čvorova

Najbolji plasman : 2016. IWR Vienna 4. mjesto



### Waterbike - Šijun (tornado, leech)

Construction year: 2013

Hulls: carbon - aramid, glass fiber

Construction: aluminum construction with carriers.

Drive and propulsion: azimuthing propulsion system (pedals and chains for bicycles - transfer to the shaft, the entrance to the multiplier - mechanical gearbox - PTO - angular gears - propeller)

Length: 5.10 m / Width: 2.10 m / Weight: 38 kg / Draft: 0.12 m

Maximum speed: 9 knots

Highest ranking: 2016 IWR Vienna 4th place



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### Vodocikl - Kajzer (car, imperator)

Godina gradnje: 2010.

Trupovi: dvotrupac - karbonska vlakna, drvo, poliuretanska pjena

Konstrukcija: aluminijска конstrukција s uzdužnim i poprečnim nosačima

Pogon i propulzija: pedale i lanci za bicikle – prijenos na poluosovine, multiplikator - mehanički prijenosnik, vratilo s osloncem u skroku pod kutom od 23 stupnjeva – brodski vijak

Duljina: 5,20 m / Širina: 1,85 m / Masa: 75 kg / Gaz: 0,1 m

Brzina: 6 čvorova

Najbolji plasman: 2013. IWR Duisburg 12. mjesto



### Waterbike - Kajzer (emperor)

Construction year: 2010.

Hulls: dvotrupac - carbon fiber, wood, polyurethane foam

Construction: aluminum construction with longitudinal and transverse beams

Drive and propulsion: pedals and chains for bicycles - transfer to the shaft, multiplier - mechanical gearbox, shaft relying on the propeller strut, propeller struts at an angle of 23 degrees - the propeller

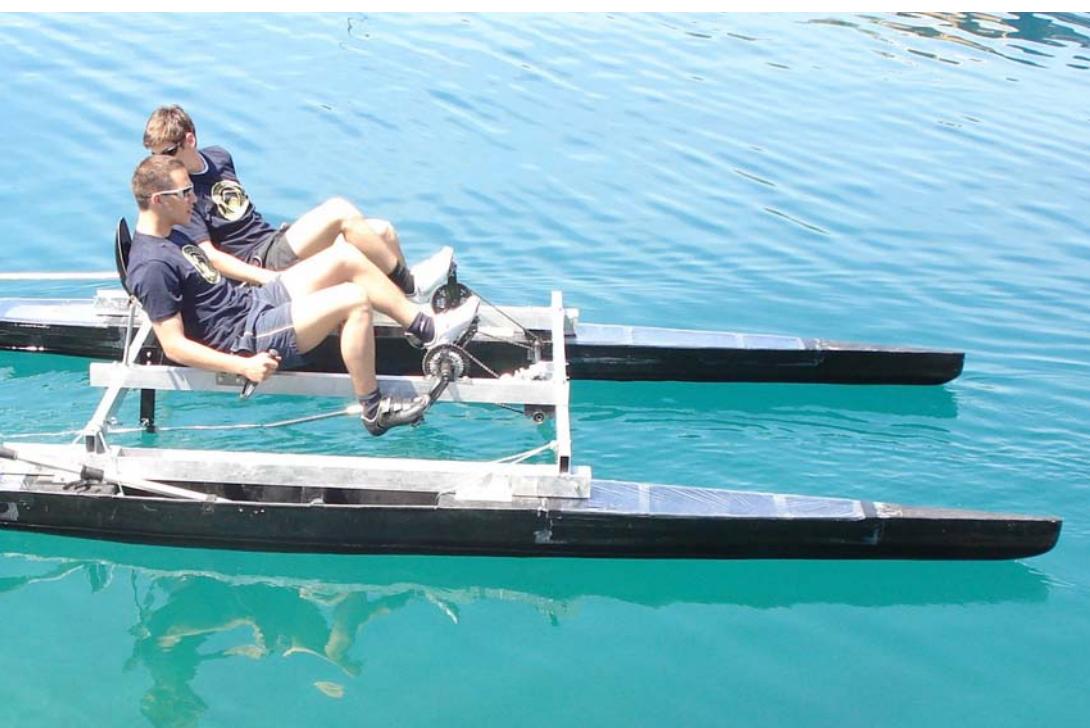
Length: 5.20 m / Width: 1.85 m / Weight: 75 kg / Draft: 0.1 m

Speed: 6 knots

Highest ranking: 2013 IWR Duisburg 12th place



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7.6 riteh waterbike

### Vodocikl - Zvizda

Godina gradnje: 2009.

Trupovi: dvotrupac – stakloplastika (preinaka kajaka jednosjeda)

Konstrukcija: aluminijска konstrukcija s poprečnim nosačima

Pogon: pedale i lanci za bicikle – prijenos na poluosovine, multiplikator

- mehanički prijenosnik, kutni prijenosnik – brodski vijak

Duljina: 5,10 m / Širina: 1,60 m / Masa: 83 kg / Gaz: 0,12 m

Brzina: 5 čvorova

Najbolji plasman: 2010. IWR Szczecin 11. mjesto



### Waterbike - Zvizda (star)

Construction year: 2009

Hulls: two-hull vessel (CAT - fiberglass (kayak single-modification)

Construction: aluminum construction with crossbeams

Drive: pedals and chains for bicycles - the transfer of the shaft, multiplier - mechanical gearbox, gearbox - propeller

Length: 5.10 m / Width: 1.60 m / Weight: 83 kg / Draft: 0.12 m

Speed: 5 knots

Highest ranking: 2010 IWR Szczecin- 11th place



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### Vodocikl - Esmeralda

Godina gradnje: 1998.

Trupovi: jednotrupac – stakloplastika

Konstrukcija: stakloplastika

Pogon: pedale i lanci za bicikl, multiplikator - vratilo pod kutem spojeno na skrok – brodski vijak

Duljina: 4,9 m / Širina: 1,2 m / Masa: 90 kg / Gaz: 0,2 m

Brzina: 6 čvorova

### Waterbike - Esmeralda

Construction year: 1998

Hulls: monohull - fiberglass Construction: fiberglass

Drive: pedals and chains for bicycle, multiplier - shaft angle connected to – propeller strut

Length: 4.9 m / Width: 1.2 m / Weight: 90 kg / Draft: 0.2 m

Speed: 6 knots



Ovogodišnja regata, 37. po redu, održana je u Beču od 25. do 29. svibnja. U Austriji se natjecalo preko 250 članova posada uglednih europskih sveučilišta s 43 različitih vodocikala. Ondje je RWT postigao najbolji rezultat u povijesti tima. Zauzeto je izvrsno četvrto mjesto u ukupnom poretku sa sljedećim rezultatima po disciplinama:

- sprint 100 m - 12. mjesto
- slalom 100 m - 7. mjesto
- ubrzanje 10 m - bez plasmana (kvar mernog uređaja)
- naprijed – stop - natrag 50 m - 2. mjesto
- maraton - 7. mjesto
- vuča o stup - 16. mjesto
- utrka iznenadenja - nismo nastupili zbog tehničkih problema

Ove godine u tim je bilo uključeno 13 studenata Tehničkog fakulteta sa svih studijskih smjerova (brodogradnja 9, strojarstvo 1, elektrotehnika 2, računarstvo 1). RITEH Waterbike Team činili su Luka Bertetić, Lucija Bujan, Darin Majnarić, Boris Tomić, Abdulah Suljić, Matea Horvat, Theo Đuga, Ljubomir Pozder, Mihovil Tomašić, Patrik Kubaska, Vanda Brandić, Petar Topljak i Vjekoslav Žiković koji su radili pod mentorstvom prof. dr. sc. Roka Dejhalle.

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Medijska vidljivost projekta:

Službena web stranica:  
<http://ritehwaterbike.uniri.hr/>

Facebook stranice:  
[facebook.com/RitehWaterbikeTeam/](https://facebook.com/RitehWaterbikeTeam/)  
[facebook.com/studirajbrodogradnjuuirjeci/](https://facebook.com/studirajbrodogradnjuuirjeci/)

Twitter:  
[twitter.com/ritehwaterbike](https://twitter.com/ritehwaterbike)

Youtube kanal:  
[youtube.com/channel/UCf2jkY0kpoakgUogCljvH4A](https://youtube.com/channel/UCf2jkY0kpoakgUogCljvH4A)

This year, the 37th regatta was held in Vienna from 25th to 29th May. More than 250 crew members from reputable European universities came to Austria with their 43 different waterbikes. RWT achieved the best result ever in the team's existence. Overall, RWT won the 4th place with the following results obtained in the disciplines:

- Sprint 100m-12th place
- Slalom 100m-7th place
- Acceleration 10m-no result (due to the failure of the measuring device)
- Back-forth-back 50m-2nd place
- Marathon-7th place
- Traction on pole-16th place
- Surprise race- the race was cancelled due to technical problems

This academic year, our competition team is comprised of 13 students from the Faculty of Engineering (9 members from naval architecture, 1 from mechanical engineering, 2 from electrical engineering, and 1 from computer engineering). RITEH Waterbike Team members are Luka Bertetić, Lucija Bujan, Darin Majnarić, Boris Tomić, Abdulah Suljić, Matea Horvat, Theo Đuga, Ljubomir Pozder, Mihovil Tomašić, Patrik Kubaska, Vanda Brandić, Petar Topljak and Vjekoslav Žiković who have worked under the supervision of Prof. Roko Dejhalla, Ph.D.

Media and social networks:

Official web page:  
<http://ritehwaterbike.uniri.hr/>

Facebook pages:  
[facebook.com/RitehWaterbikeTeam/](https://facebook.com/RitehWaterbikeTeam/)  
[facebook.com/studirajbrodogradnjuuirjeci/](https://facebook.com/studirajbrodogradnjuuirjeci/)

Twitter:  
[twitter.com/ritehwaterbike](https://twitter.com/ritehwaterbike)

Youtube channel:  
[youtube.com/channel/UCf2jkY0kpoakgUogCljvH4A](https://youtube.com/channel/UCf2jkY0kpoakgUogCljvH4A)



Fale na slici: Matea Horvat, Vjekoslav Živković i Vanda Brandić  
/ Missing from the picture: Matea Horvat, Vjekoslav Živković and Vanda Brandić



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## 7.7 adria hydrofoil team

ADRIA Hydrofoil Team (AHT) čine skupina studenata Tehničkog i Pomorskog fakulteta u Rijeci. Projekt je pokrenut 2015. godine na inicijativu dijela studenata iz RITEH Waterbike Team i kolege Stipe Plenče. AHT se bavi projektiranjem i izradom hidrokrilnih plovila za međunarodno natjecanje Hydrocontest koje pokrenuto 2013. godine na inicijativu organizacije Hydros Foundation sa sjedištem u Ženevi i švicarske privatne banke „Lombard Odier“. Prema pravilima natjecanja plovilo mora biti pogonjeno električnom propulzijom i radio upravljivo. Dimenzijska ograničenja plovila su 2,5 m x 2,5 m x 2 m što znači da je timu u potpunosti prepušten dizajn i izvedba plovila. Svaki tim može imati najviše osam članova te mora imati menadžera, članove zadužene za logistiku i komunikaciju, a ostale funkcije se dodjeljuju prema potrebama. Samo natjecanje koncipirano je tako da pridonosi razvoju novih tehnologija u brodogradnji i pomorstvu (primjena električne propulzije i hidrokrilne tehnologije) s naglaskom na energetsku i ekonomsku učinkovitost te zaštitu okoliša (smanjenje emisije CO<sub>2</sub> i ostalih stakleničkih plinova). Uz smanjenje emisije plinova, električna propulzija smanjuje buku i vibracije koje također imaju štetan utjecaj na morske organizme. S obzirom da projekt spaja tehnologiju, unapređenje u komercijalnoj uporabi i zaštitu okoliša, dobar je primjer prijeko potrebne, ali i premalo zastupljene etike u inženjerstvu.

Timovi se natječu u tri discipline: prijevoz lakog tereta od 20 kg, prijevoz teškog tereta od 200 kg i utrka izdržljivosti u trajanju od 2 h. Također, plovila mogu konkurrirati za nagrade: inovacija za prijevoz lakog i teškog tereta, ekološki prihvatljivo plovilo, nagrada za komunikaciju i promicanje natjecanja.

Kroz rad na projektu studentima se omogućuje primjena stečenog znanja i vještina na područjima tehničke struke (električna propulzija, specijalne brodske forme, struktura i otpor broda, brodska elektronika, brodostrojarstvo) i ekonomski struke (organizacija, planiranje, financije, logistika i menadžment). Obim projekta je za stepenicu viši od projekta Waterbike i korak bliže projektu solarnog plovila.

Na natjecanju u srpnju 2016. u Lozani u Švicarskoj bilo je prijavljeno 24 sveučilišta iz cijelog svijeta s preko 30 plovila. AHT je na svojem prvom sudjelovanju s plovilom „AITAC“

Adria Hydrofoil Team (AHT) is a team of students from the Faculty of Engineering and Faculty of Maritime Studies , bothparts of Rijeka University. The project was launched in 2015 on the initiatives of some students from Waterbike Team. Due to the financial problems of supporting the project and the lack of communication among students, an agreement between these two Faculties was signed so that this project has become a University project. AHT constructs and makes hydrofoil vessels for international Hydrocontest competition. Hydrocontest is a new contest that started in 2013 on the initiative of the Hydros Foundation organized in Geneva by Swiss private bank „Lombard Odier“. According to the rules of competition, a vessel must be driven by electric propulsion and navigated by radio transmitters. Dimensions of a vessel are 2,5 m x 2,5 m x 2 m, which means that the team is completely responsible for design and good appearance of a vessel. Each team can have maximum 8 members and must have a manager, members in charge for logistics and communication, and also other functions are given according to need. Competition is so concipated that it contributes to the development of new technologies in shipbuilding and maritime industry (application of electric propulsion and hydrofoil technology) with a focus on energy and economic efficiency and enviromental protection (the reduction of CO<sub>2</sub> and other greenhouse gases emissions). In addition to reducing emissions, electric propulsion reduces noise and vibrations which also have a detrimental impact on the flora and fauna of the sea. Since the project combines technology, improvement in commercial use and enviromental protection, it is a perfect example of much needed, but not so much represented, engineering ethics.

The teams compete in three disciplines: Light Load(not exceeding 20kg) TransportCompetition , Heavy Load (not exceeding 200 kg) Transport Competition and 2h Endurance Race Competition . Also, vessels can compete for the prizes in innovation for the transportation of light and heavy loads, eco friendly vessels, and for the awards for communication and promotion of competition.

Trough this work, students have an opportunity to show their knowledge and skills inengineering fields (electric propulsion, special ship forms, structure and ship resistance, marine



nastupio u sve tri discipline te je ostvario slijedeće rezultate:

- Prijevoz lakog tereta od 20 kg – 16. mjesto
- Prijevoz teškog tereta od 200 kg – 16. mjesto
- Utrka izdržljivosti – 11. mjesto

U timu je bilo uključeno ukupno devet studenata Tehničkog i Pomorskog fakulteta sa svih različitih studijskih smjerova (brodogradnja 3, elektrotehnika 1, brodska elektrotehnika 1, brodostrojarstvo 1, logistika i menadžment 2) pod mentorstvom prof.dr.sc. Roka Dejhalle. ADRIA Hydrofoil Team činili su: Stipe Plenča, Boris Tomić, Ljubomir Pozder, Patrik Kubaska, Kristijan Nikolozo, Marko Orobabić, Andrea Juhas i Ian Koljesnikov.

Medijska vidljivost projekta:

Službena web stranica tima:  
<http://adriahydrofoil.uniri.hr>

Vimeo kanal:  
<https://vimeo.com/user46447700>

Facebook:  
[facebook.com/Adria-Hydrofoil-Team-1674673626151920/](https://facebook.com/Adria-Hydrofoil-Team-1674673626151920/)

electronics, marine engineering) and economic fields (organisation, planning, finance, logistics and management). This project is slightly bigger than the Waterbike project and is also one step closer to solar vessel projects .

This year, 24 universities from all around the world and over 30 vessels participated. AHT, with their „AITAC“vessels with slight changes in construction, competed in all three disciplines in their first competition. The results are:

- light loads of 20 kg transport - 16th place
- heavy loads of 200 kg transport - 16th place
- endurance race - 11th place

In team there were 9 students included from the Faculty of Engineering and Faculty of Maritime studies , and also from other colleges (i.e.,from the Faculty of Naval Architecture 3 students, from the Faculty of Electrical Engineering 1, Marine electrical Engineering 1, Marine Engineering, logistics and management 2) all mentored by Prof. D. Sc. Roko Dejhalla. The Members of ADRIA Hydrofoil Team are: Stipe Plenča, Boris Tomić, Ljubomir Pozder, Patrik Kubaska, Kristijan Nikolozo, Marko Orobabić, Andrea Juhas and Ian Koljesnikov.

Media and social networks:

Official web page:  
<http://adriahydrofoil.uniri.hr>

Vimeo channel: <https://vimeo.com/user46447700>

Facebook:  
[facebook.com/Adria-Hydrofoil-Team-1674673626151920/](https://facebook.com/Adria-Hydrofoil-Team-1674673626151920/)



### "AITAC Hydrofoil"

Godina gradnje: 2016.

Trupovi: trimarska forma – trupovi u cijelosti izrađeni od karbonskih ojačanja

Krila: sendvič konstrukcija s aluminijskim profilima i karbonskom oblogom

Konstrukcija: aluminijске cijevi i profili

Pogon i propulzija: elektro motor 1,4 kW, brodski vijak

Baterije: Samsung Litij-ionska baterija 130 komada ( $\approx 30$  A)

Duljina: 2,45 m / Širina: 1,5 m /

Masa: 30 kg (prazno plovilo) / Gaz: 0,57 m

Maksimalna brzina: 8 čvorova

### "AITAC Hydrofoil"

Construction year: 2016

Hulls: trimaran form – full carbon fiber

Foils: Sandwich construction with aluminum

section ribs and carbon fiber plating

Construction: The longitudinal and transverse

beams of aluminium tubes 3.5 mm

Drive and propulsion: 1.4 kW engine and

controllable pitch propeller

Batteries: Samsung Li-Ion battery

130 pcs. ( $\approx 30$  A)

Length: 2.45 m / Width: 1.5m /

Weight: 30kg / Draft: 0.57m

Maximum speed: 8 knots



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## 7.8 riteh drone team

Riteh Drone Team je studentski projekt koji djeluje pod mentorstvom izv. prof. Kristijan Lenca i asistenta Diega Sušnja, a primarni cilj je ostvarenje projekata vezanih za bespilotne letjelice.

Riteh Drone Team osnovala su krajem lipnja 2016. godine tri studenta: Domagoj Poljančić, Gordan Nekić i Franko Hržić. Stoga je cijelokupni rad na projektu tek u začecima. Rad Riteh Drone Team fokusiran je na istraživanje i razvoj tehnologija vezanih za procesiranje i prikupljanje podataka pomoći bespilotnih letjelica te sam razvoj i unaprijeđenje bespilotnih letjelica. Riteh Drone Team svoj rad planira kroz međusobno nezavisne projekte što znači kako uvijek postoji mogućnost otvaranja novih projekata, ukoliko za njih postoji interes. Ovakav način rada otvara vrata Riteh Drone Teamu brojnim studenima koji su voljni razvijati upravo ove tehnologije te omogućava fleksibilnost u suradnji s drugim udružama i organizacijama. Zbog velikog interesa studenata i profesora i uz ulaganje puno rada i truda, ovaj projekt ima sjajnu budućnost, s obzirom da entuzijazma ne nedostaje.

Riteh Drone Team is a student project mentored by Prof. Kristijan Lenc and assist. Diego Šušnja, the primary goal of whom is the realization of projects related to drones.

Since Riteh Drone Team project was initiated by 3 students-Domagoj Poljančić, Gordan Nekić and Franko Hržić, late in June of the year 2016, the whole work on this project is still in the project development process . The work of RDT is not only focused on researching and developing technologies related to processing and collecting some information about drones but also on developing and improving drones. RDT is currently planning its work through projects that are not closely related to this subject, which means that there are also possibilities for new projects in case there is any interest in it. This modus operandi means that students willing to develop these technologies are welcome and that it allows flexibility in collaboration with other associations and organizations. Due to huge interest from students and professors, this project has a bright future which can be realized with a lot of work and enthusiasm.



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# 7.9 akademski sport - uspjesi sportaša

## academic sport - achievements of athletes

### EUROPSKE SVEUČILIŠNE IGRE ZAGREB -

**RIJEKA 2016**

/ EUROPEAN UNIVERSITIES GAMES

ZAGREB-RIJEKA 2016

- Duje Peroš (kapetan/captain),  
Andrija Kaluđerović

**1. mjesto (Vaterpolo M)**

/ 1st place (Water polo M)

**UniSport HR**

*UniSport Finals (Poreč)*

- Anamarija Jurić / Ana Paškvan  
(Trener/ Trainer: Ljubomir Pozder)

**2. mjesto (Tenis Ž)**

/ 2nd place (Tennis F)

*UniSport Finals (Poreč)*

- Ana Tomas, Erika Fafanđel

**1. mjesto (Odbojka Ž)**

/ 1st place (Volleyball F)

*UniSport Finals (Poreč)*

- Katarina Konestabo

**3. mjesto (Futsal Ž)**

/ 3rd place (Futsal F)

*UniSport Finals (Poreč)*

- Luka Lasić, Kristijan Smiljanić, Luka Babić,  
Karlo Čule, Danijel Jurišić

**2. mjesto (Odbojka M)**

/ 2nd place (Volleyball M)

*UniSport Finals (Poreč)*

- Romano Šćulac, Marin Đurica, Toni Katalinić,  
Marin Sorić, Tomislav Karaula

**3. mjesto (Rukomet M)**

/ 3rd place (Handball M)

*UniSport Finals (Poreč)*

- Tin Krstić, Ivan Kučan

**3. mjesto (Košarka M)**

/ 3rd place (Basketball M)

*UniSport HR sveučilišno prvenstvo (Zagreb)*

/ UniSport HR University Championship

(Zagreb)

- Dases Jardas / Noa Poklepović

**2. mjesto (Badminton M)**

/ 2nd place (Badminton M)

**UniSport RI**

*Ukupni pobjednik UniSport RI lige 2015/2016:*

/ Overall Winner of UniSport RI league:

**Tehnički fakultet**

/ Faculty of Engineering

*Najbolji muški kolektiv UniSport RI lige*

2015/2016:

/ Best male Collective UniSport RI league

2015/2016:

**Tehnički fakultet**

/ Faculty of Engineering

*Najbolji sportaš UniSport RI lige 2015/2016:*

/ Best Athlete of UniSport League 2015/2016:

**Noa Poklepović**

*Najbolji trener/voditelj UniSport RI lige*

2015/2016:

Best Trainer/Manager of UniSport RI League:

**Ljubomir Pozder**



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