

1873
НАУКА О
МАШИНАМА
1897 МАШИНСКО
ТЕХНИЧКИ ОДСЕК
1948 МАШИНСКИ
ФАКУЛТЕТ
БЕОГРАД

1873 - first subject on mechanical engineering
1897 - mechanical engineering department
1948 - faculty of mechanical engineering

University of Belgrade



MECHANICAL ENGINEERING @ UNIVERSITY OF BELGRADE



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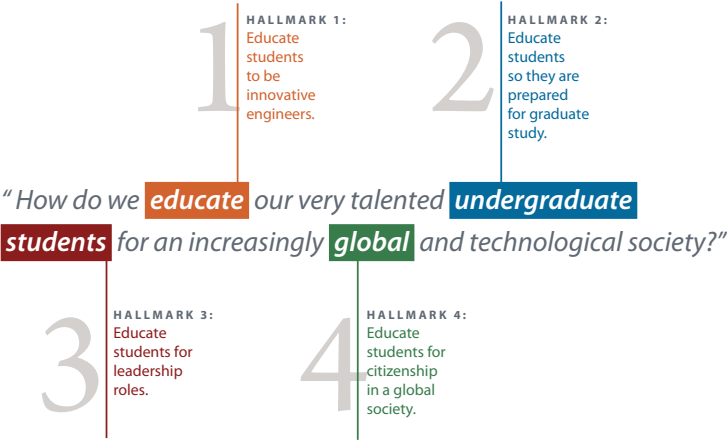
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**Deans through 60 years
of the Faculty history**

MESSAGE FROM THE DEAN

This year anniversary campaigns of 200 years of University of Belgrade (UB) and 60 years of Faculty (School) of Mechanical Engineering (FME) are excellent occasions for publishing this brochure. With Academic Studies Guide booklet published in parallel, a reader gets to know our Faculty in detail, finds out the exciting world of study and research in mechanical engineering in Serbia and Belgrade, at the preeminent engineering school in the Balkan region and at the oldest university and mechanical engineering faculty in the nation.

We are everyday witnesses how fast the pace of technological change accelerates. Today, we do not need to imagine Mars aliens coming here – we are there with primarily mechanical and electrical engineering! It is very exciting to take active part in this process where technology is transforming our times and lives.

To successfully play a role in direct technology-life interaction, someone needs to become a very qualified engineer. There is an increasing demand for engineers who can work both in academia with strong analytical skills and in industry with practical ingenuity that is necessary for solving problems in a variety of disciplines. Also, the engineer of the future must be creative, have good communication and business management skills, and provide leadership to the community. So, the education that pays much more attention to the fundamental than to the trendy, to the creative more than to the routine, is very needed and appreciated.

UB-FME is training engineers of the future – prepares them for the scientific and engineering creation, its application in industry and management of technology through rigorous and up-to-date curricula and teaching methods. UB-FME graduates go on to leadership roles in engineering, technology, and other careers, such as business, medicine, law and politics, for which creativity, rigorous quantitative thinking, effective communication skills, and a strong commitment to human values are essential. Diversity of ideas and experiences is encouraged as collaborative teams work on solving challenging problems.

UB-FME has a long history of excellence at all levels of education - we offer bachelor's, master's and doctoral degrees in mechanical engineering. Some departments and master modules are unique in the Balkans, and some of them are separate faculties elsewhere in the world (for instance: aerospace engineering, industrial engineering, computer science in mechanical engineering, naval architecture, etc.). We focus on high-quality, student-centered education and over the last years, we have moved from traditional education, relying on proficiency in specific engineering disciplines and rigid curricula, to a

new paradigm of proficiency based on flexible and interdisciplinary curricula following the principles of Bologna Declaration.

Research is integrated into the curriculum to enhance the educational experience and has had a significant impact in all key engineering areas. A genuine commitment to students and research, and a sincere desire to contribute to industry and society are our main strengths.

UB-FME has over 20,000 alumni, many of whom have assumed such high academic positions as academicians, vice-rectors, deans, or are famous researchers in national research laboratories, CEOs or presidents of national and international companies, and heads of government agencies or even political positions as prime ministers, vice-presidents of the government, ministers, etc.

Faculty has a steady and rapid increase of its annual turnover reaching financial result of ten millions euros for this year, which now becomes an excellent guarantee that the Faculty resources rapidly grow and form a needed basis for more advanced research. This result is achieved by strong ties with national and local research and industrial institutions. Our effort to foster research collaborations enables bringing research experience into the classroom.

Belgrade is an exciting city to live in and study. Home to a government and parliament, research laboratories and industrial headquarters, the Belgrade metropolitan area offers excellent opportunities for internships, training, research collaboration and employment. The great location of our nation's capital also inspires people in and around.

We invite you to visit the web site to review our day-to-day activities and to follow-up our progress. Let us work together to place UB-FME in a position of unique transnational leadership. Your comments and feedback are welcome.



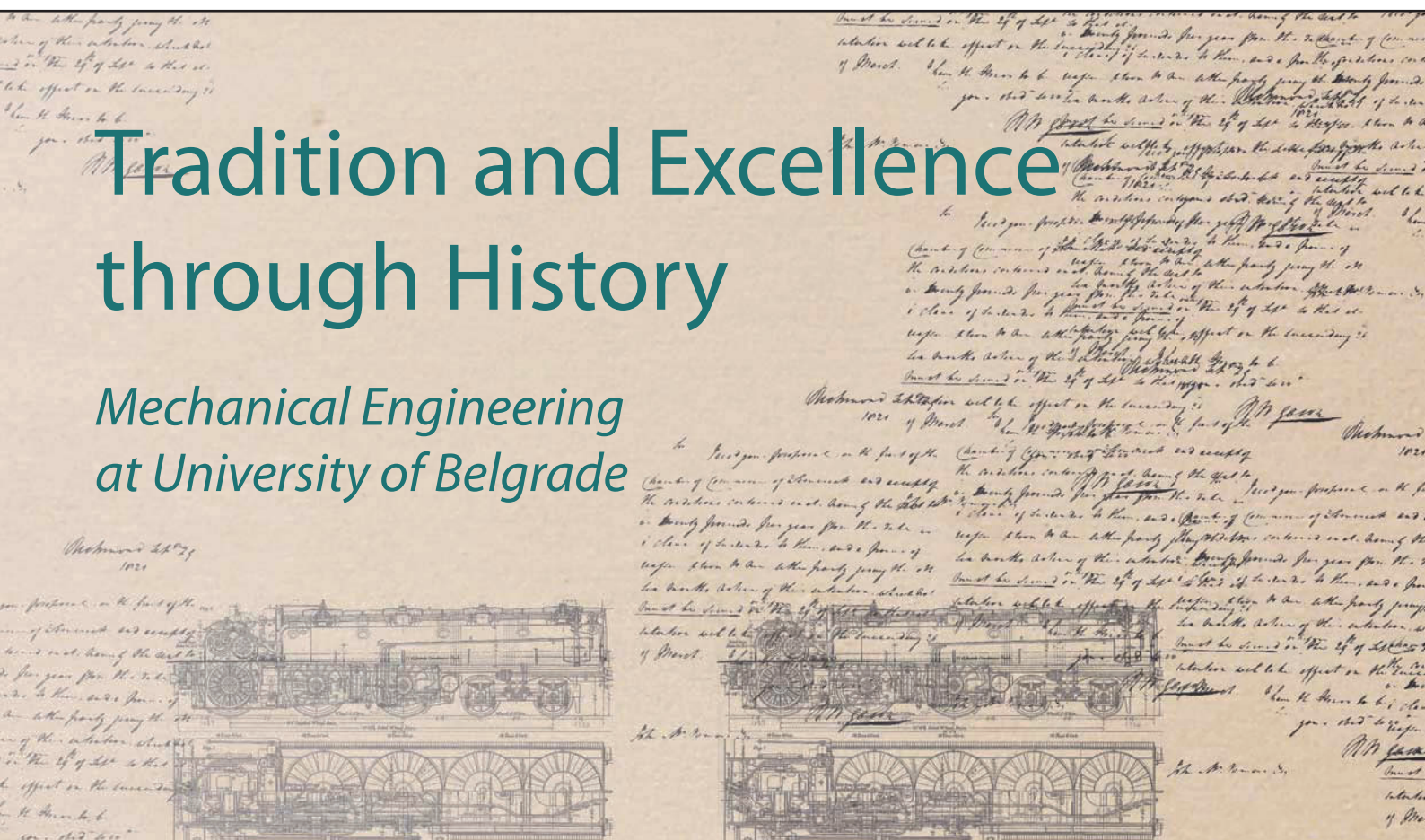
As we celebrate the first 135 years of mechanical engineering in Serbia and 60 years of the proclaimed Faculty, the leader in engineering education and research, join us to advance together to new frontiers of knowledge and education!

**Prof. Dr. Miloš Nedeljković, Dean the 22nd
University of Belgrade, Faculty of Mechanical Engineering**

History

Tradition and Excellence through History

Mechanical Engineering
at University of Belgrade



1808

1863

1873

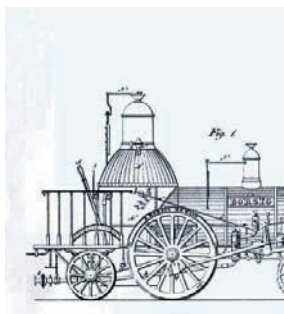
1897

1808

Grand School



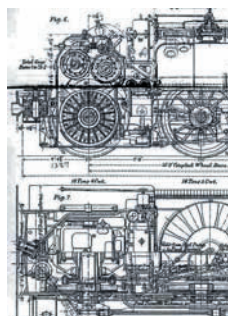
Technical Faculty on
the Grand School



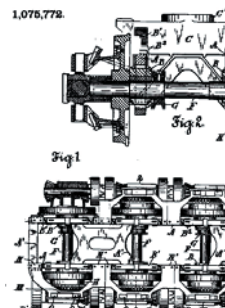
1863

1873

Subject: Mechanics
and the Science of
Machines



Mechanical-
Technical department



1897



1905

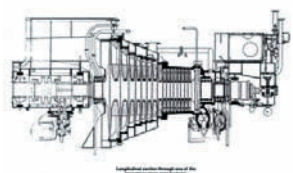
1948

1960

today

1905

Grand School
became University



Proclamation of the
Faculty of Mechanical
Engineering



1948

1960

Start in the new
building



today

The City of Belgrade

Belgrade is situated in South-Eastern Europe, on the Balkan Peninsula. It lies at the point where the river Sava merges into the Danube, on the slope between two alluvial planes. The river waters surround it from three sides, and that is why since ancient times it has been the guardian of river passages. Because of its position it was properly called "the gate" of the Balkans, and "the door" to Central Europe. Along the ridge of the slope, from Belgrade Fortress, along the Knez Mihailova street, across Terazije to Slavija, stretches the main city traffic artery.

In Knez Mihailova street, the coordinates of Belgrade are marked:

- * 44°49'14" of northern latitude
- * 20°27'44" of eastern longitude
- * altitude 116.75 m.

Belgrade is the intersection of the roads of Eastern and Western Europe which lead through the Morava-Vardar valley and Nišava-Marica valley to the shores of the Aegean Sea, to Asia Minor and to the Middle East. Belgrade lies on the Danube river, the sailing route, which connects the Western Europe and Central Europe countries with the countries of South-Eastern and Eastern Europe. The City recently became popular river cruising destination. The ships from the Black Sea sail to its docks, and with opening of the Rhine-Main-Danube canal, Belgrade came to the center of the most important sailing route in Europe: The North Sea and Atlantic - Black Sea route.

Belgrade, a city of very turbulent history, is one of the oldest cities in Europe. Its history lasts full 7,000 years. The area around two great rivers, the Sava and the Danube was inhabited as early as palaeolithic period. Remains of human bones and skulls of Neanderthals, found in the stone-pit near Leštane, in a cave in Čukarica and near the Bajloni market, date back to the early Stone Age.



"The sky above Belgrade is wide and high, unstable but always beautiful; even during winter serenities with their icy splendour; even during summer storms when the whole of it turns into a single gloomy cloud which, driven by the mad wind, carries the rain mixed with the dust of Panonian plain; even in spring when it seems that it also blooms, along with the ground; even in autumn when it grows heavy with the autumn stars in swarms. Always beautiful and rich, as a compensation to this strange town for everything that isn't there, and a consolation because of everything that shouldn't be there.

But the greatest splendour of that sky above Belgrade, that are the sunsets. In autumn and in summer, they are broad and bright like desert mirages, and in winter they are smothered by murky clouds and dark red hazes. And in every time of year frequently come the days when the flame of that sun setting in the plain, between the rivers beneath Belgrade, gets reflected way up in the high celestial dome, and it breaks there and pours down over the scattered town. Then, for a moment, the reddish tint of the sun paints even the remotest corners of Belgrade and reflects into the windows, even of those houses it otherwise poorly illuminates."

Written about Belgrade by: Ivo Andrić, Serbian Nobel prize laureate.





"Ad augusta per angusta"

Through trial to triumph

How our programmes work

Programmes are modular, consisting of self-contained units taught and assessed on a semester basis. As student progresses through each semester and passes the examinations, he/she will earn credit for the courses that he/she has successfully completed. Therefore, throughout programme the student will have a clear indication of his/her academic progress. All programmes are composed of core and optional units, giving to the student a lot of flexibility and opportunities to shape his/her studies and to develop his/her own interests. It will take 60 ECTS per year.

Assessment

ECTS credits are assessed individually, with methods of assessment varying according to the nature of the subject. Most subjects combine continuous assessment, such as projects, lab work, orals and written examinations.

Semesters

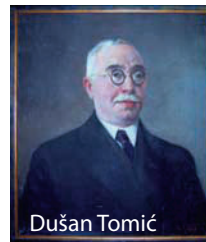
The academic year is divided into two semesters; each semester consists of a teaching period followed by exams. The year begins in October and ends in June, with the usual Christmas, Easter and Summer vacations. There is an additional examination period in September.

Teaching

There is a variety of teaching methods, combining the traditional lectures with seminar teaching, team-based group projects and laboratory-based practicals. The Faculty is proud of its relatively

small group teaching methods which help to develop analytical, presentation and communication skills. All of these are highly valued by employers throughout the world.

Cum Laude Students Awards

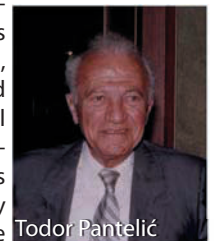


Dušan Tomić

Annually, Faculty awards students who achieved excellence in studies and research. At each year of studies, there is the prize for magna cum laude student and award for all students above grade point average 9 (on the scale of 6 to 10). Also, there are special prizes for the student who graduated with highest grade point average and for the student who graduated first in his class (generation).

Besides Faculty awards, there are prizes:

"Dušan Tomić" (former Professor at the Faculty /b.1875-d.1947/ and one of the founders of the Department, prize funded by his family), for magna cum laude student who graduated in courses given by Department of Thermal Science, and "Todor Pantelić" (former Professor at the Faculty /b.1923-d.1999/, prize is given by the Fund for development in Theory of Mechanisms and Machines), for cum laude student who graduated in courses given by Department of Theory of Mechanisms and Machines.



Todor Pantelić

Study Abroad

Opportunities to live, study and work in another culture expand students horizons and increase his/her opportunities of employment in various companies. European exchanges take place under the well-established Tempus and Socrates Programmes of the European Commission. As Faculty fully implements the European Credit Transfer System (ECTS), qualifications gained at Faculty of Mechanical Engineering are easily recognized and understood in other European countries, and vice versa. Of course there is lots of demand for many of these places, so whilst we'll do our best we cannot guarantee places in specific countries or at specific universities. If you have any questions, contact the department to which you are applying for further information.

Enterprise and Industry Links

The Faculty has strong links with business and industry and it is keen to build on this and encourage an entrepreneurship culture among students and staff.



Accommodation and Hospitality Services



Living in Belgrade

Is there guaranteed University accommodation for first-year students (freshmen)?

Unfortunately No. Although there are many places in dormitories around University of Belgrade system of campuses, nobody can guarantee accommodation.

Where are the residences?

There are 11 student dormitories.

Studentski Grad. Capacity: 4,406 in double, three-bed, four-bed and five-bed rooms of A category. Address: Tošin Bunar 143, 11070 New Belgrade. Phone number: +381 11 2699 302.

Student dormitory Slobodan Penzeic. Capacity: 5 single-rooms, 350 double-rooms and 17 three-bed rooms. Address: Bana Ivaniša bb, 11000 Belgrade. Phone number: +381 11 412 638, + 381 11 3400 384.

Student dormitory Kralj Aleksandar I. Capacity: 122 double rooms, 11 three-bed rooms and 62 four-bed rooms. Address: Kralja Aleksandra Boulevard 75, 11000 Belgrade. Phone number: +381 11 401 800.

Student dormitory Patris Lumumba. Capacity: 68 double rooms and 295 three-bed rooms. Address: Dragice Pravice 1, 11000 Belgrade. Phone number: +381 11 751 977.

Student dormitory 4. April. Capacity: 279 three-bed rooms and 13 double rooms. Address: Vojvode Stepe 320, 11000 Belgrade. Phone number: +381 11 3976 307, +381 11 3974 990

Student dormitory Karaburma. Capacity: 210 single rooms and 480 double rooms. Address: Mije Kovacevica 7b, 11000 Belgrade. Phone number: +381 11 750 962.

Student dormitory Rifat Burdžević. Capacity: 7 single rooms and 180 double rooms of A category. Address: Milana Rakica 77, 11000 Belgrade. Phone number: +381 11 2413 435, +381 11 2423 029

Student dormitories Vera Blagojevic I and II. Capacity: 37 double rooms, 53 three-bed rooms and 20 four-bed rooms. Address (Vera Blagojevic I): 27. marta Str. 48, 11000 Belgrade. Phone number: +381 11 324 6663. Address (Vera Blagojevic II): 37 Dalmatinska, 11000 Belgrade. Phone number: +381 11 759 943.

Student dormitory Žarko Martinović. Capacity: 13 single rooms, 8 double rooms, 2 three-bed rooms, 7 four-bed rooms and 25 five-bed rooms. Address: Cara Dušana 254, 11080 Zemun. Phone numbers: +381 11 618 003, +381 11 3160 003.

Student dormitory Mika Mitrović. Capacity: 8 single rooms, 62 double rooms and 10 three-bed rooms of A category. Address: Kralja Vladimira 33, 11000 Belgrade. Phone number: +381 11 3970 283



What choice will student have?

A broad range of room types to suit all budgets is offered and over 30% of all rooms have individual en-suite facilities. All residences are similarly organised with big study rooms located in every one, on ground floor usually. The demand for certain residences is very high, so fulfilment of all preferences is not guaranteed, but every effort will be made to ensure that the fee level and room type are comparable to those of your preferred option.

How and when do student apply?

Please refer to our students counselor for all details, from September 1st your year of entry:

Tel: +381.11. (33-70-350; 33-70-339; 33-02-251; 33-02-254)

Web: [http://www.mas.bg.ac.yu \(.rs\)/](http://www.mas.bg.ac.yu (.rs)/)

Email: mf@mas.bg.ac.yu, dekan@mas.bg.ac.yu (.rs)

Does student room have a telephone connection ?

There are LAN connection in some residences but in most of them you will have to use dial-up to connect to the Internet.

All residential blocks have individual telephone connections in every room. Internal telephone calls are free and for outgoing services students use 0 to call out. Payment is at the end of month.

What about welfare and security?

Resident managers work in each complex and are available to give advice and guidance to all residents. They help foster a good living environment with special regard to student welfare, discipline and safety, as well as organising lots of social activities! The Security Office is also open 24 hours for the benefit of all students.

Can Faculty offer students family accommodation?

Family accommodation in Belgrade can be expensive and it is strongly recommended that students with families do not bring their spouses and/or children to Belgrade until they have found suitable accommodation. The Student Accommodation Office will always do its best to provide new students with temporary single accommodation while they seek family housing.

How student seek private accommodation if he does not want to live in University residence?

An information and advice service is provided for students who may prefer to live in private accommodation. Please contact us for self-catering lodgings, bed-sits, flats and houses, which are available to rent in the private sector and we can help and advise on tenancy agreements and housing contracts. You can expect to pay minimum approximately 100 euros per month for a room in a shared flat; heating, electricity, gas and telephone bills will be in addition. Belgrade has a good supply of private sector accommodation!

Medical Assistance for Foreign Students

The medical care system in Serbia is public, but there are also private clinics offering medical care. European Social Security Card is not accepted in Serbia, however, Serbia signed agreements that regulate social security with following countries: Denmark, Sweden, Czech, Bulgaria, Austria, Luxemburg, Bosnia & Herzegovina, Macedonia, and Croatia.

Students from other countries can have medical assistance primarily at students' health clinic, STUDENTSKA POLIKLINIKA – STUDENTS POLICLINIC (near Nikola Tesla museum), Krunska 57, tel. 2430-814, www.studpol.co.yu, as well as in other public and private institutions.

Financial Information

Learning Centre

Tuition Fees

The costs of students' academic education at Faculty are covered with tuition fees. They include core teaching costs and registration. Books, supplementary examinations and re-examination fees, and field trips are not included. If we offer the student a place, we will decide whether they qualify as a Serbian (citizens of some countries do qualify) or international student for fees purposes. We will then be in a position to give them more detailed information on the costs of programme of study. The following provides the basic information you need.

Serbian and Bi-Lateral Students

Serbian students who do not qualify themselves as a governmentally financed pay tuition. Tuition fee will be approx. €1,000 per year. A similar fee is payable in each subsequent year of full-time study. The Government will determine the percentage increase which will apply. If students live in Serbia or they are Bi-Lateral students, they do not have to pay this fee up-front at registration; it is possible to pay it in several installments.

International Students

The fee for undergraduate students is approx €3,000. It is likely that this fee will increase each year. We want to make sure that students studies are not unnecessarily disrupted, and may therefore ask them for advance written evidence that they, their family or sponsor can pay the tuition fees. Students must ensure that they have sufficient resources to cover tuition as well as living expenses before they accept any offer we make to them.

Living Expenses

How much people spend as a student will be, to some extent, up to them and will also be affected by what they study and for how long. For a 38 week (approx 10 months) period, an undergraduate should think in terms of the following rough guide based on 2008/09 costs:

Rent room in University of Belgrade residence €1,000

Food at (€200 per month) €2,000

Personal Toiletries €50

Laundry & Housekeeping €90

Clothes €270

Travel (local and outside Belgrade e.g. home) €775

Leisure/Social/Sport at (€25 per month) €250

Telephone (landline & mobile) €270

Contingencies (unexpected bills) €90

Contents Insurance (€3,000 belongings & €1,000 laptop) €105

Books, materials, photocopying & equipment €300

TOTAL €5,200



The Learning Centre and Library

We have a vital role to play during your time at the Faculty of Mechanical Engineering. Situated at the Faculty building, we are open from 9am to 5pm weekday, during semesters and our aim is to provide you with all the information you need when you need it. The surroundings are rustically old, comfortable and ideal for study and there are 200 reading spaces available for both group-work and individual study.

Library has over 100,000 books and periodicals and we invest heavily in electronic journals and databases and have 500+ networked PCs plus lap-top docking points and wireless access (in development).

The University Library's web-catalogue guides you to high-quality resources, as well as it provides detailed information on all University Library services. Its electronic resources are accessible over the Internet from anywhere using KoBSON.

Library staff is always willing to help you with enquiries. More specific queries will be handled by the subject specialist for your area of study or interests.



Computing Services

The Faculty of Mechanical Engineering Computing Laboratories work with the departments to provide appropriate computing facilities to help you with your studies. All students are issued with a computer username and password when they join the Faculty; this allows them to use one of 500+ PCs (32 of them in Web-Sokak are available from 8am to 8pm every day, 7 days a week).

The latest versions of subject-specific software are provided, including statistics (Matlab) and engineering drawing and modelling packages (AutoCAD, CATIA, SolidWorks, ProEngineer, etc).

Students have access via the Internet to the Web and e-mail. Students can also connect to eight powerful computers for parallel programming at SimLAB (donation of German universities, HRK). From their rooms at the dormitories students can access all the above services. Additionally, many laptop docking points will be given all across the Faculty. In addition, the Faculty will be extensively equipped with wireless technology, to enable internet access from virtually all public areas on the campus.

Situated in the Learning Centre there is a friendly 'Help-Desk' to which you can bring your queries.

IT training courses are also provided for undergraduates and graduates, and our facilities include a fully-equipped video conferencing suite at recently upgraded fifth floor.



Careers

Employability of Mechanical Engineering Graduates

Faculty of Mechanical Engineering is well known for the success of its graduates in the employment market. We believe that the employability of our graduates is very important. Faculty will help you develop your employability, identify your preferred career plan and achieve it.

Why choose Mechanical Engineering?

Just look around you. How much of what you see has been manufactured? Engineers are involved in the design and manufacture of everything, from cars to airplanes. Many recent medical advances have been made as a result of work done by engineers: from brain scanners to the drug dispensers used by asthma sufferers.

If you want to be an informed member of society, able to understand modern technology as well as the infrastructure on which our society is built, then there can be no better training than that given to mechanical engineers at University of Belgrade. Graduates of the Faculty have benefited from education that enables them to make a real difference to the world outside while, at the same time, pursuing successful and rewarding careers.

Your options should be open

The training that engineers receive is scientifically rigorous. The distinctions between mathematicians, physicists, computer scientists and engineers are blurring all the time. Mechanical engineers are team players and work closely with professional colleagues from other backgrounds. Very few people describe themselves as physicists or mathematicians on their passports. Nearly all 'scientists' have to apply their science at some stage and that is engineering. Studying Mechanical Engineering keeps your options open.

What's so special about studying Mechanical Engineering at the Faculty?

Our graduates are in demand. Our aim is to provide our students with all the mathematical, analytical and computing skills that underpin modern engineering practice, while encouraging the creative skills and problem-solving strategies that are so important to a good mechanical engineer. You will learn the skills needed for team leadership and how to apply new technologies in novel situations: the skills you will need to master technical and managerial demands throughout your professional career.

Graduates from the Faculty of Mechanical Engineering at University of Belgrade are always in great demand from employers in all the major industrial and commercial sectors, be it manufacturing, energy, oil field, automotive industry, HVAC and many other disciplines of mechanical engineering and not only that, many of our graduates work in information technology or even in finance. Why not join them?

Is there any Partnership with Industry?

In recent years, the Faculty has forged strong links with industry. Spin-off companies from the Faculty have played a large part in creating the centre for high technology that the city of Cambridge has now become.

Finding that job

We are continually developing links with graduate recruiters and receive new vacancy information all the time. <http://poslovi.infostud.com/> is an online service that matches employer information and job vacancies against your profile and automatically sends you an email alert when your criteria are matched.

Careers talks and workshops

The winter and spring terms provide an opportunity to attend talks and skills workshops. These provide insights into specific careers and help with interview techniques, psychometric testing, business awareness, applications and time management. All of this is done with collaboration to University of Belgrade Centre for Career Development (<http://www.razvojkarijere.bg.ac.yu/>). The Centre also organizes presentations by leading graduate recruiters and produce Job Fair for final year students and recent graduates, which lists all the recruitment activities for the coming year. The Centre system allows you to book online for careers events and activities, including quick query appointments.

Entrepreneurship

Through cooperation with faculties of Civil, Electrical and Chemical Engineering and with the City of Belgrade, the Faculty founded Business Technology Incubator. Incubator is a new venture designed to empower student entrepreneurs. Also, Faculty founded Innovation Centre which is an economic development tool designed to accelerate the growth and success of students' entrepreneurial companies through an array of business support resources and services.

Alumni - A lifelong connection

Student days are the beginning of a lifelong relationship with the Faculty. There are many Faculty of Mechanical Engineering alumni spread through numerous countries. This means that wherever your career takes you there will be a network of alumni to help you keep in touch with the Faculty and help you find your feet.

Upon graduation you will become a member of the Faculty of Mechanical Engineering Alumni Fund (<http://alumni.mas.bg.ac.yu/>). Alumni members remain involved with the Faculty by attending events, joining in with the activities of the alumni groups, supporting current students by advising on careers and arranging internships, and making donations to the Faculty's annual giving programme. When you have completed your studies, the Office of Alumni will keep you in touch with the Faculty through the once-yearly alumni magazine, monthly e-bulletins and the alumni website. We look forward to welcoming you back to the many events held throughout the year. The Faculty takes special care on its graduates who graduated 50 years ago by special promotion and issuing them golden diplomas.





Study Modules

Biomedical Engineering



"A true multidisciplinary program is designed to put your engineering skills and thinking skills to a critical test by exploring and contributing to the most valuable research area – improvement of human health. Here, it is possible to put your understanding of the essence of physical laws into entirely different context of living, biological, systems. How well do we know the connection of ourselves and underlying mechanisms that enable us to do everyday's work?"



Dušan Kojić
PhD student at
Biomedical Engineering

BIOMEDICAL ENGINEERING

The study module of Biomedical Engineering is one of the youngest at the Faculty with open perspective worldwide. Research activities of the staff focus on investigations of biological systems from the molecular level, across cellular dynamics level, to the levels of tissue and organ systems, for the purpose of developing a wider, systemic approach based, understanding of the functioning of various parts that comprise human body, for the purpose of designing and realizing diagnostic and therapeutic devices for medical applications.

Besides human body, a systemic approach has been applied for studying the biosphere by exploring factors that have determined, during the course of evolution, constitutive elements and functional interrelationships of basic natural interactions (electricity, magnetism, heat etc.) in the human organism, as well as elements which, through pollution, disrupt its functioning. Depending on degrees acquired and their personal interests, students are supported and guided to excel in their main areas of interest.

Our main research areas are:

- (1) early skin cancer and melanoma detection,
- (2) nanomedical engineering,
- (3) biomedical software engineering,
- (4) clinical engineering.

LABORATORY FOR SKIN BIOPHYSICS RESEARCH - CENTER FOR EARLY DIAGNOSIS OF MALIGNANT MELANOMA

As a natural extension of previous research activities a laboratory is being developed for the purpose of Early Diagnosis of Malignant Melanoma that uses the following equipment:

- A digital-optical microscope comprised of an optical system with magnification of x1000 and digital camera (7,1MP) for image acquisition purposes
- Opto-magnetic system for characterizing the response of materials and tissues to opto-magnetic stimulation.

OBLIGATORY COURSES for MSc

- Fractal mechanics
- Biomedical instrumentation and equipment
- Biomaterials 2
- Biomechanics of tissue and organs
- Signal processing
- Skill praxis M – BMI
- Design of assistive medical devices
- Design of biomedical devices and machines
- Nano-medical engineering
- MSc thesis (Diploma work)

In cooperation with European, US and Australian universities we are organizing international summer schools and workshops. With Boston University and RMIT University, the following international Summer School projects were realized:

- July 2005, International Workshop entitled Biomechanics: Theory and Applications gathered many international experts in this field and proved great interest of foreign experts.
- July 2006, International Workshop and Summer School entitled Cell and Tissue Engineering was organized in cooperation with the Faculty of Technology and Metallurgy



Biomedical Engineering - a truly
MULTIDISCIPLINARY challenge

AEROSPACE ENGINEERING

The Department of Aerospace Engineering has played an integral role in educating aeronautical engineering students, conducting innovative and exciting scientific research, and improving the economic development of Serbia.

The popularity of this programme, like most aeronautical engineering programmes, rides the waves of defense spending and the economic times of the country. Throughout its illustrious history, the programme has continued to be an important training ground for future engineers across the country, the region and the nation.

The mission of the Aerospace Engineering Department is to provide a quality undergraduate and graduate aerospace engineering education and to advance the engineering and science knowledge base through research. The educational programme is constantly updated to meet contemporary aerospace engineering demands and challenges. Aerospace Engineering offers coursework that fully prepares students to become members of advanced design teams prepared for the challenges of modern aerospace engineering worldwide.

The goals of the Aerospace Engineering programme are:

- To provide a comprehensive aeronautical engineering education that develops in students the fundamental skills necessary for the design, synthesis, analysis and research development of aircraft, spacecraft and other high technology flight systems; and

OBLIGATORY COURSES for MSc

- Applied aerodynamics
- Structural analysis
- Computational aerodynamics
- Flight dynamics
- Composite structures
- Skill praxis M – BA3
- Aircraft control and systems
- Aircraft propulsion
- Aircraft design
- MSc thesis (Diploma work)

- To prepare students for the aeronautical engineering profession and related fields by developing in them attributes needed to make significant contribution to the society and to the engineering profession now and in the future.

The educational objectives of the Aerospace Engineering programme are to produce graduates whose expected accomplishments, two to five years after study, are successful careers in industry, private practice, or government, or to pursue advanced postgraduate studies. They will be skilled practitioners who apply their knowledge and skills to solve relevant engineering problems in the aeronautical or a related profession.



Aerospace Engineering

“Aerospace Engineering is by its very nature a creative profession. When practicing engineers develop solutions to open-ended, real-world problems, they must employ conscious and subconscious mental processing as well as divergent and convergent thinking. If you like to question, explore, invent, discover, and create, then Aerospace Engineering could be the ideal profession for you!”



Kosta Branovački
Graduate student in
Aerospace Engineering

Naval Architecture



Ship BELUGA SKYSAILS
Hull made at VAHALI shipyard in Belgrade

Degree programme offers an opportunity for study at an advanced level of naval architecture theory, analysis and design procedures for various kinds of ships, unusual vessels and floating bodies in general. An important part of the studies is individual work on comprehensive projects that should be presented and defended to course staff.



Nikola Momčilović
PhD student of
Naval Architecture

NAVAL ARCHITECTURE

The main goal of study module is to provide advanced education and graduate engineers qualified to work successfully in the field related to various aspects of ships.

Courses taught include ship buoyancy and stability, ship strength, ship structures, ship production, ship engines and equipment, sea-keeping, maneuvering, (computer aided) ship design, but also advanced courses, for instance, ship waves, aero-hydrodynamics of sailing vessels, high speed craft, numerical methods in ship structural design, wave induced loads etc.

The department graduates are engineers who are responsible for the design, construction, and/or repair of ships, boats, including: Merchant ships (oil/gas tankers, cargo ships, bulk carriers, container ships), Passenger/vehicle ferries, High speed craft, Yachts (power boats, and other recreational craft), various kinds of floating structures etc..

Our graduates typically work for shipyards, shipping companies, design firms and consultancies, equipment manufacturers, regulatory bodies and governments. Many of the department's graduates now hold prominent positions in the shipbuilding industry in Serbia, Montenegro and other countries all across the globe (Canada, Australia, The Netherlands, etc.).

OBLIGATORY COURSES for BSc

- Buoyancy and stability of ship 1
- Ship structures 1
- Shipbuilding technology
- Ship systems
- Ship equipment

OBLIGATORY COURSES for MSc

- Ship resistance
- Ship strength 1
- Ship propulsion
- Buoyancy and stability of ship 2
- Ship structures 2
- Skill praxis M – BPO
- Ship design
- Seakeeping
- Marine Engines
- Ship turbines and boilers
- MSc thesis (Diploma work)

COURSES for PhD

- Dynamics of ships
- Ship waves
- Developments in ship structural design
- Topics on ship hydrodynamics
- Aero-hydrodynamics of sailing yachts
- Computational methods in marine hydrodynamics
- Wave induced loads on ships
- Numerical methods in ship structural design
- High speed craft

Welding and Welded Structures

WELDING AND WELDED STRUCTURES

Welding and welded structures is one of the youngest modules at our Faculty. It will enable engineers at B.Sc. level to be engaged in simpler jobs like maintenance, and M.Sc. level to be engaged in more complex tasks like welding procedure specification, examination and monitoring of welded joints, design and analysis of welded structures, not only by the standard procedures, but also using the advanced one, like structural integrity analysis.

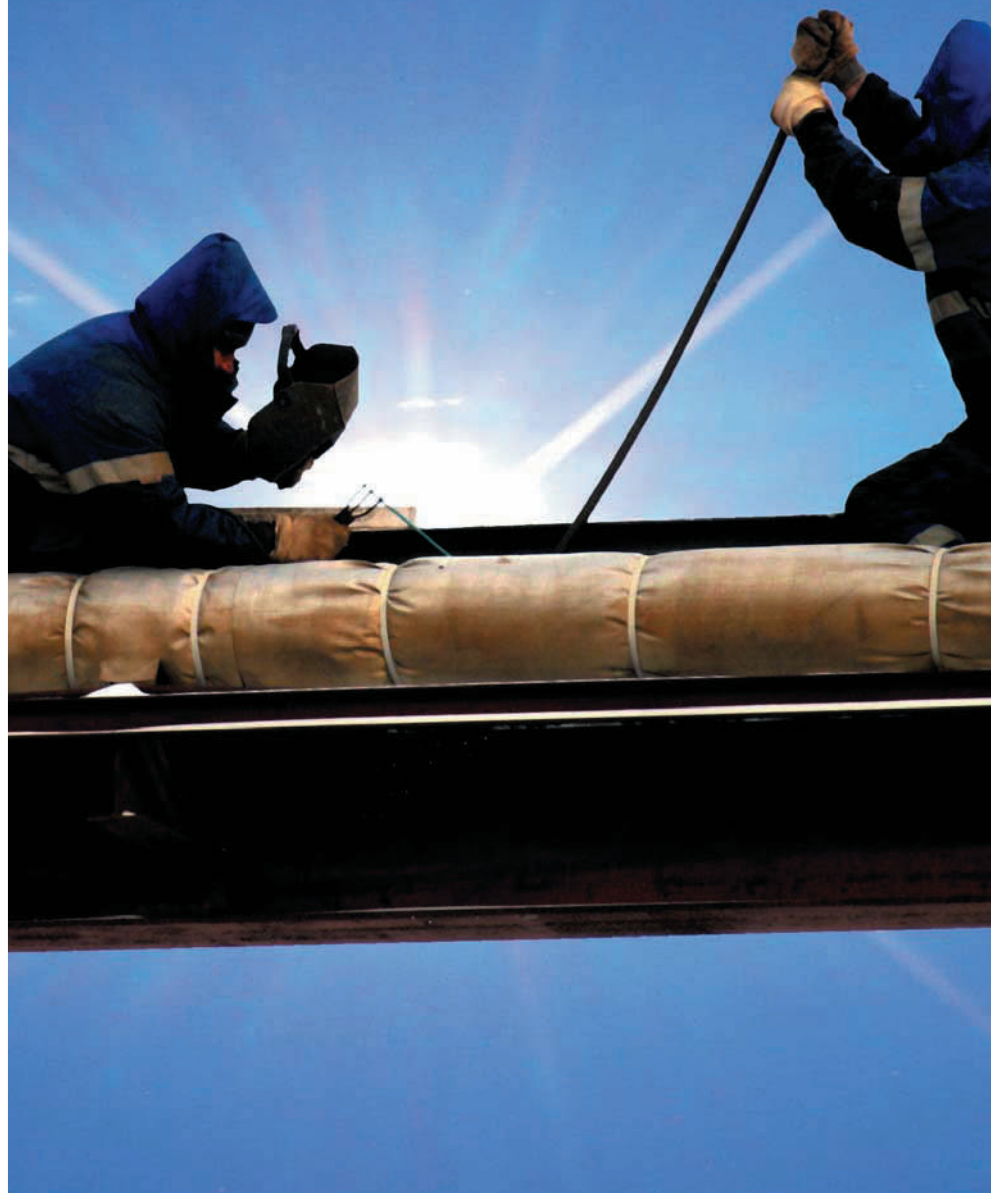
OBLIGATORY COURSES for MSc:

- Engineering materials 3
- Fuel, lubricants and industrial water 2
- Finite element method 2
- Tribomechanical systems
- Development of machine systems (with ДУМ)
- Service strength
- Skill praxis M – 33K
- Specialized joining techniques
- Gearbox reliability
- Structural integrity
- MSc thesis (Diploma work)

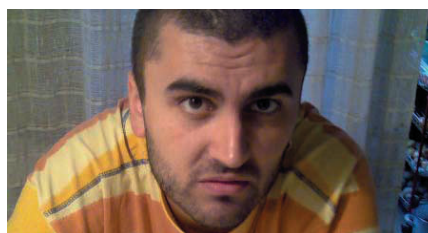
This module is designed in such a way to cover (at M.Sc. level) the minimum requirements for the education, examination and qualification of International Welding Engineers (IWE) according to the document EWF 409-06 and will be soon accepted by the Authorized National Body (ANB) in Serbia. The four main topics are incorporated in our courses as follows:

1. Welding processes and equipment, including conventional and unconventional processes, as well as related processes.
2. Materials and their behaviour during welding, focused on weldability of all important structural materials.
3. Construction and design, including strength and integrity of welded joints.
4. Fabrication, applications, engineering, with special focus on case studies and practical examples.

Other than this, M.Sc. students will acquire basic knowledge of modern methods for strain and stress calculation and analysis, like the finite element method, both in linear elastic and elastic-plastic domain. More generally, computer-aided-design (CAD) procedures are included in a few courses. Failure analysis and repair procedure specifications complete the circle in solving problems related to welded structure behaviour, including creep, fatigue and corrosion phenomena.



“ Our professors are proud because they provide broadly-based education to us, allowing us as department graduates to find employment in all sectors of the industry-in welding itself, manufacturing, automotive, building systems, energy, chemical and even consulting. ”



Miloš Kuprešanin
Undergraduate student in
Welding and welded structures

“Design in mechanical engineering introduces all aspects of machine systems development. General and multidisciplinary approach supported by EU universities provides wide possibilities of knowledge applications. Designer skills enriched by this module are applicable in development of all mechanical systems.”



*Marija Stevanović
Undergraduate student in
Design in Mechanical Engineering*

DESIGN IN MECHANICAL ENGINEERING

In this study module participation of several departments (General machine design, Production engineering, Aerospace engineering, Industrial engineering, Material handling, etc), ensures the needed multidisciplinary approach for this complex field. Engineering design is combined with Industrial design, and enriched by bionics, ergonomics, aesthetics, ecology etc. Machine system, developed to provide function and user needs, is harmonized to human features, environmental and ecological needs. Machine systems are not supposed to disturb natural environment, but rather they should ennoble it.

Students have opportunity to perform numerous design activities such as Conceptual design (generate ideas – brainstorming), Embodiment design (design parameters definition, decision making, axiomatic and genetic methods, CAD shape modeling, FE methods application, simulations, etc). Additional activities comprise transformation of biological principals to technical systems (bionics), harmonization to human features (ergonomics) and to environment (ecology). Aesthetic design is one of the main objectives which students can perform using CATIA software, 3D printing (rapid prototyping), 3D scanning, virtual reality etc.

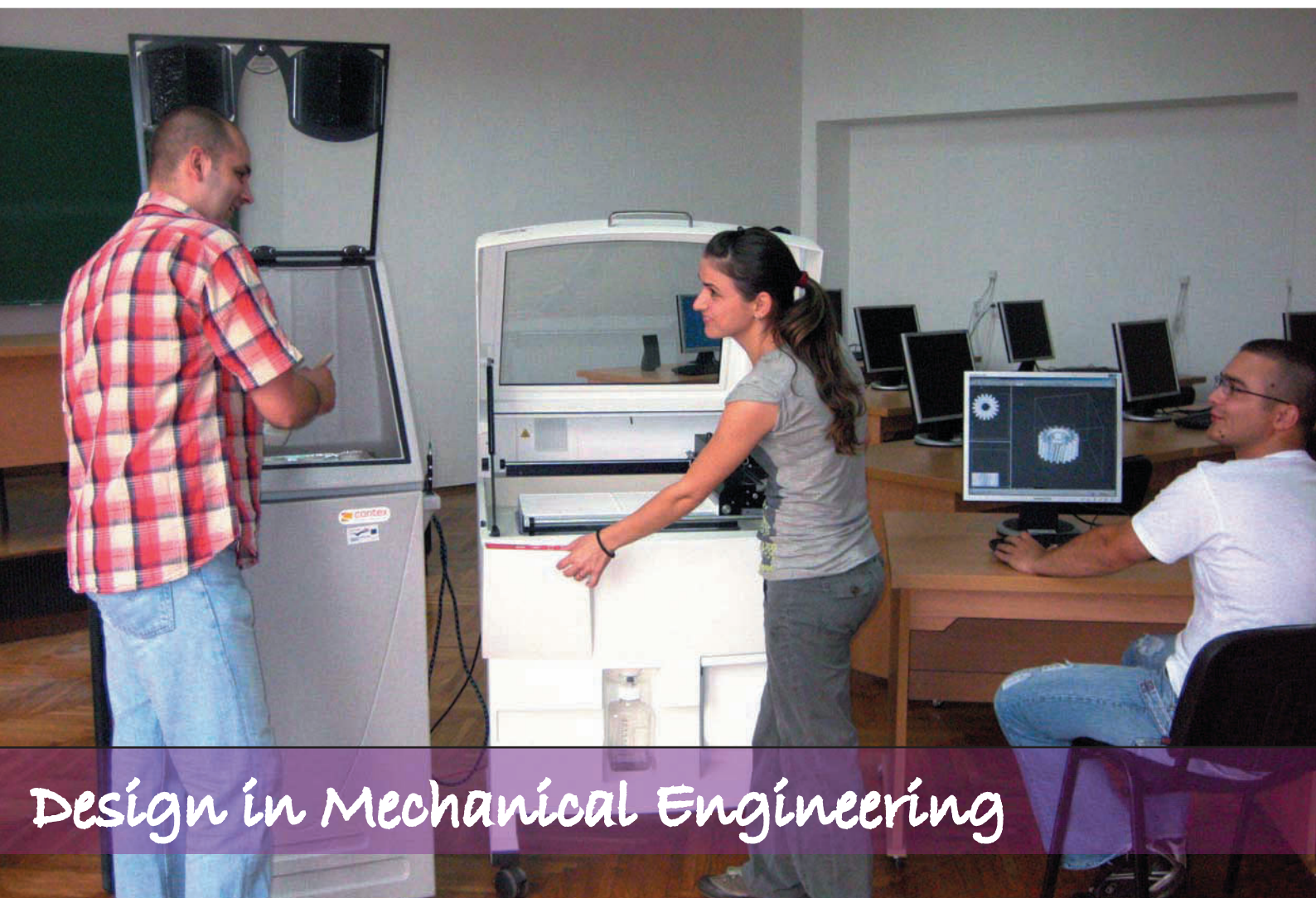
OBLIGATORY COURSES for MSc

- Product aesthetic
- Axiomatic methods
- Ergonomic design
- Development of machine systems
- Methods for decision making
- Bionics in design
- Special methods in product development
- Design and ecology
- Skill praxis M – DUM
- MSc thesis (Diploma work)

Elective module, Design in Mechanical Engineering, trains mechanical engineers of general orientation with additional skills of new technical (mechanical) system development (Engineering Design); technical system harmonization with market needs (Industrial Design); harmonization with human being needs and natural environment. Mechanical engineer with listed skills has the main role in every expert team for product development in all branches of engineering.

VISITING PROFESSOR

- Prof. Dr.-Ing. Harald Meerkam,
Friedrich-Alexander-Universität, Lehrstuhl für
Konstruktionstechnik



Design in Mechanical Engineering

INFORMATION TECHNOLOGIES

Rapid dissemination of digital technologies has been accompanied by the development of high-performance intelligent machines, such as next generation mobile devices, hybrid cars and robots. These products and services are made possible by the integration of various technologies through digital technology. In response to current trends, the study module of Information

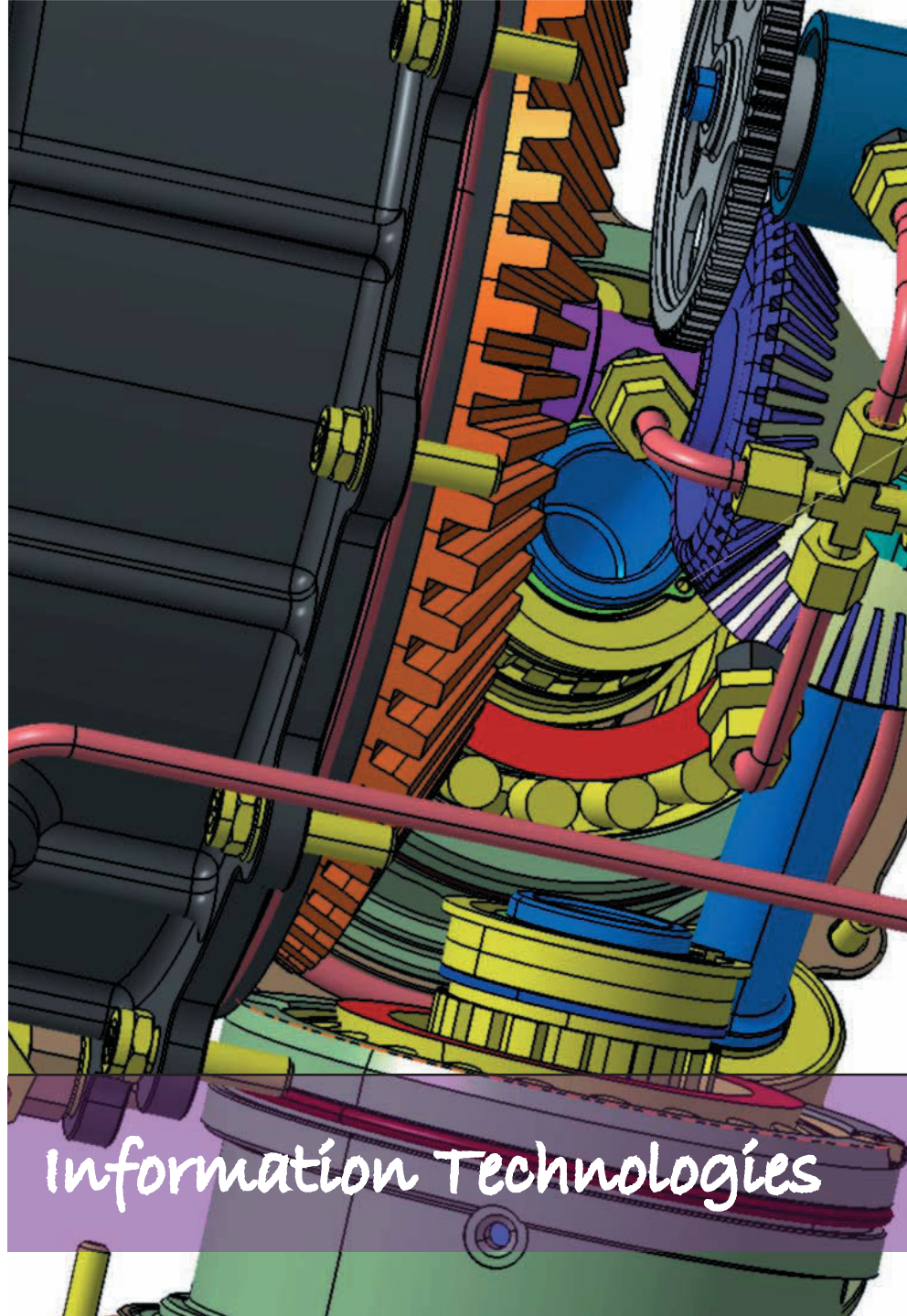
OBLIGATORY COURSES for MSc.

- Programming language C
- Object oriented programming and JAVA
- Digital systems (with CAY)
- Programmable control systems
- Data structures and algorithms
- Skill praxis M – MIT
- SQL
- Construction engineering (modelling and optimisation)
- Introduction to engineering simulations
- MSc thesis (Diploma work)

Technologies (MIT) produces engineers who can utilize advanced equipment and information technology in a broad range of fields from product development to the construction of intelligent information services.

MIT produces human resources and technology that will integrate mechanical engineering, the foundation of design and manufacturing, with information engineering. This in turn is supposed to have a major impact on society. MIT offers educational programmes to impart the basic knowledge and practical application ability in those areas of dynamics essential to equipment design, cartography and processing technology. We lecture subjects required for manufacturing products, control theory and computer control for machine and equipment control, and information-related subjects such as knowledge processing, and the Internet, all of which are essential for the creation of viable computer models as well as the application of these technologies. In addition, students are given opportunities to conduct actual research through participation in joint projects with business enterprises in such areas as high-performance intelligent equipment, design and manufacturing technology and computer network technology..

Our students master the latest technology and research methods required for careers as researchers or engineers. The module program provides training in mechanical, digital and software technology to produce engineers with strengths in both information and mechanical engineering, and consequently, regardless of the surrounding economic conditions, graduates are sought after by businesses in a broad range of fields, including not only the manufacturing industry but also semiconductor and information system related businesses.



“ Our curriculum is design-intensive and includes unique mechanical engineering labs which teach basic mechanical design concepts in a hands-on manner. A unique graduate design lab has all the facilities needed to do design work for courses or projects. ”



Nikola Letilović
Graduate student in
Information Technologies

“ To move people and millions tons of freight in environmentally friendly, energy efficient and cost effective way is the challenge facing our modern and rapidly developing society. My wish to learn how engineers can help to solve these problems, was decisive to choose to study Railway Mechanical Engineering! ”



Katarina Samardžija
Graduate student in
Railway Mechanical Engineering

RAILWAY MECHANICAL ENGINEERING

To be able to successfully work in the Railway Mechanical Engineering field you should learn several things. First the wheels on rail movement and guidance principles come. Then we need to know different components of moving resistance.

The power needed for train movement and resistance overcoming makes different types of locomotives like moving power transforming plants. Diesel-engine or electric power from the catenary needs to be transformed into mechanical energy. Pure mechanical gears can do this for small power locomotives only. In most other cases, electric or hydrodynamic gear is needed. But there are lot of variations and each of them needs appropriate control system. Unfortunately technical systems are not ideal, and some energy dissipation is always present. Cooling system of the locomotive has the task to bring out excessive heat generated by this cause. For the train, we need auxiliary power sources, like compressed air for the brake system and other devices. Compressor system on the locomotive should master that.

And when we put the train in the movement, the dynamical forces and accelerations arise. What are possible consequences, what are the acceptable limits, and what an engineer can do to keep all dynamical phenomena in acceptable limits,

should be learned, too.

Another problem with the train in motion is how to stop the moving mass of several thousands ton? The brake system must be reliable, well coordinated within maybe hundred of vehicles in train, and safely controlled from the locomotive.

We make the vehicles for people transportation and for freight traffic. They must be put in appropriate, strong enough structure. We need to learn how to design, calculate and afterwards to test the strength of structure.

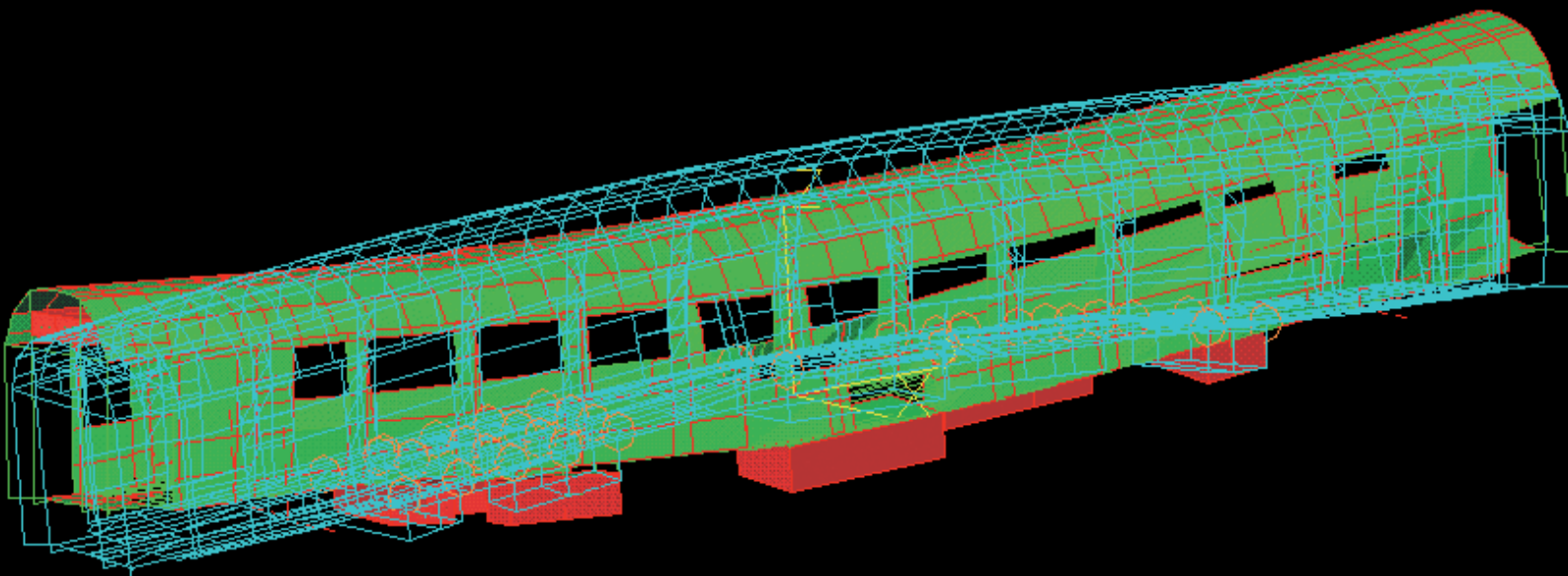
Something forgotten? Of course, we need to know how to maintain and repair these vehicles also and ...

Lot of interesting things! Isn't it?

OBLIGATORY COURSES for MSc

- Railway cars 1
- Theory of traction
- Locomotives 1
- Railway cars 2
- Brakes of rail vehicles
- Skill praxis M – ЖЕМ
- Locomotives 2
- Railway vehicles maintenance
- Basics of rail vehicle dynamics
- MSc thesis (Diploma work)

Railway Mechanical Engineering



Shape No. 11, $f=7.54\text{Hz}$

INTERNAL COMBUSTION ENGINES

Since internal combustion engines are one of the most complex and dynamic machines, studies demand multidisciplinary approach. Therefore, we at the Department of Internal Combustion Engines (ICED) dedicate ourselves to provide BSc, MSc and PhD education for the students interested to enter the field of engineering which continually grows and develops faster than ever in its 120 year long history.

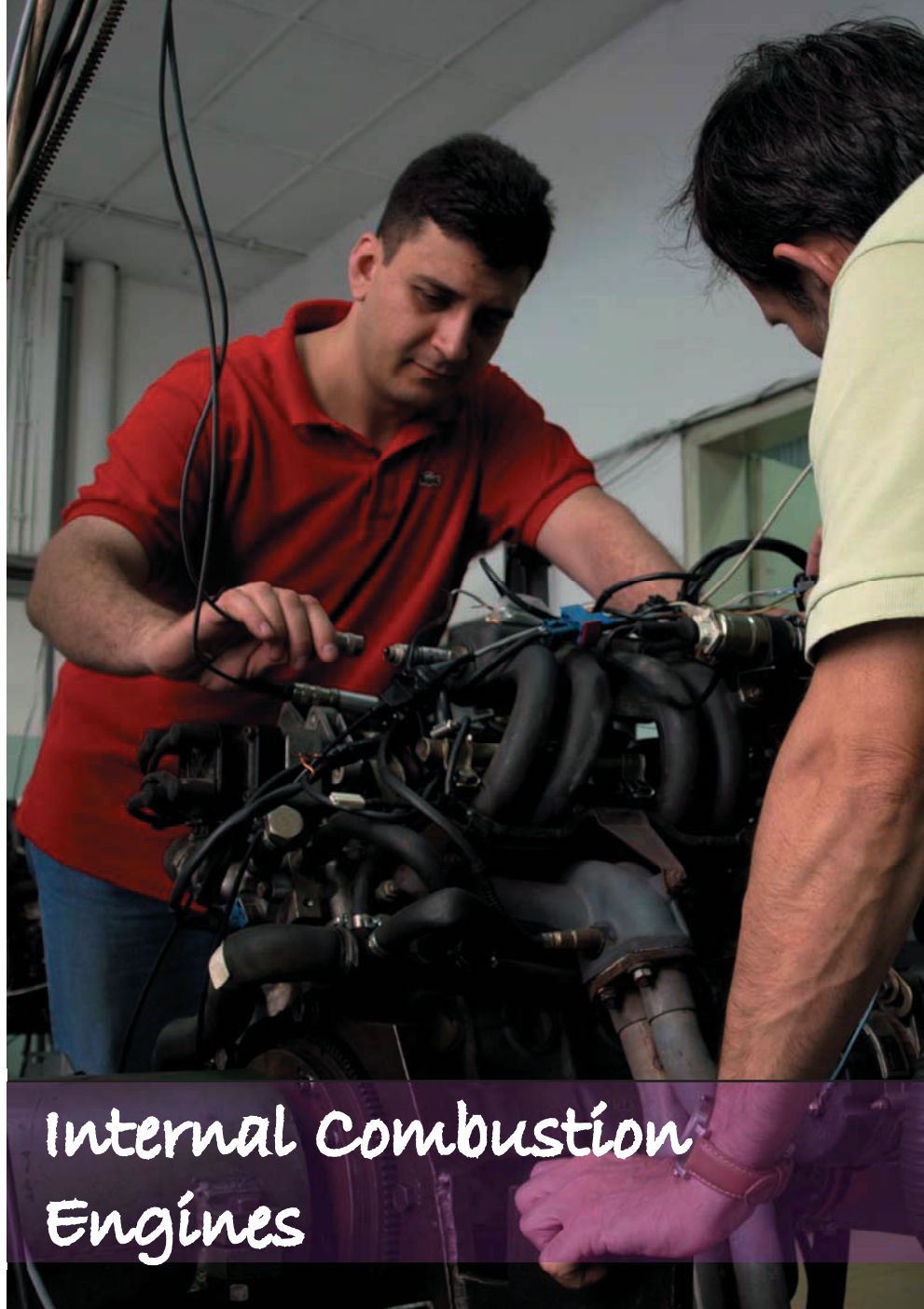
The study programmes at ICED rely on fundamentals in mathematics, fluid and thermal sciences, with focusing issues on combustion, heat transfer and gas flow. We further provide students with in-detail knowledge and advanced approach in fields of engine process, its modelling and simulation, mixture formation, turbo charging and engine mechatronics. Acting with a sense of social and ecological responsibility, we apply special attention to lectures concerning pollutant formation and control and evaluation of alternative power sources.

Study of Internal Combustion Engines is hardly imaginable without extensive laboratory practice. For this reason, we at ICED, apply special attention to practical training in instrumentation and measurement techniques in general, highlighting very interesting topics in special techniques of stationary and dynamic measurements on engines. ICED, widely recognized for development of its own high-tech measuring and acquisition equipment and application of advanced high quality instrumentation, encourages students to involve in experimentation as a basic tool in engine development.

World wide recognized practice to involve students to participate in research projects during their thesis work, use of large laboratory facilities, modern equipment, problem-solution oriented lectures and almost individual approach to each student, are some of the main benefits of studying at ICED.

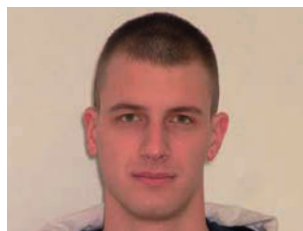
OBLIGATORY COURSES for MSc

- Engine working processes
- Engine fuelling and ignition systems
- Engine design 1
- IC engines mechatronics
- Supercharging of IC engines
- Skill praxis M – MOT
- Engine design project
- Engine testing;
- Engine design 2
- Ecology of mobile power sources
- MSc thesis (Diploma work)



Internal Combustion Engines

“Most people know that engineering requires hard work and strong technical skills. As a member of such a respected profession, you will receive a high amount of prestige. An understanding of technology will provide you with a better understanding of many issues facing our society.”



Emil Veg
Graduate student in
Internal Combustion Engines

Engineering of Biotechnical Systems



“From the beginning of my studies Agricultural Department made me realise how useful newly gained knowledge in this domain can be. It can improve the quality of people’s lives by using new technologies and techniques in agricultural engineering.”



Ivana Stekic
Graduate student in
Engineering of Biotechnical Systems

ENGINEERING OF BIOTECHNICAL SYSTEMS

Agricultural Engineering task is to apply technological and engineering tools to increase the agricultural production and efficiency, improve product quality, while preserving the quality of the environment.

These problems will be of even greater concern in the future. Courses unify the learned concepts into a practical ability to solve a broad range of engineering problems encountered in agriculture, biotechnology and food processing.

The main concept of education, research and direction of this department development is precision farming which concerns modern technologies, such as computers design and construction; computer simulations; control and navigation; GPS and DGPS technologies; CANbus systems, etc.

Engineering of Biotechnical Systems module educates highly qualified engineers capable of designing, constructing, researching maintenance of agriculture machines, facilities and equipment. That is conducted through bachelor, master and PhD studies.

Diploma work refers to the actual problems of agricultural machineries, primarily projects necessary for producers and users of agricultural machines and equipment.

Graduates have a variety of career options, depending on their area of specialization (interests). Employers include government agencies, civil engineering firms, food companies, machinery companies, and many other. Most of our students are offered positions immediately upon graduation.

OBLIGATORY COURSES for BSc

- Renewable and secondary resources
- Theory of Agricultural Machines and Equipment
- Machines and Equipment for Food processing and Production
- Engineering in Food Production
- Drying and hydrothermal processes

OBLIGATORY COURSES for MSc

- Technological processes in agro complex
- Tractors and self-propelled agricultural machines
- Attached agricultural machines and equipments
- Special techniques and technologies in drying process
- Exploitation and maintenance of agricultural machines and equipment
- Skill praxis M – ИБС
- Design of agricultural machines
- Measurements and automation in agricultural machines and equipment
- Design of plants and process and energy systems (with ППМ)
- MSc thesis (Diploma work)

MOTOR VEHICLES

The Department of Motor Vehicles prepares students for a wide range of careers in a fastgrowing, rapidly changing automotive industry through BSc, MSc, and PhD educational levels.

The demand for skilled, educated, and honest professionals continues to intensify as the complexity of the modern automobiles increases. Students will be provided with the tools and techniques necessary to achieve their potential. They will be shown how to produce an idea for product development or how to make decisions related

OBLIGATORY COURSES for MSc

- Design of vehicles
- System effectiveness
- Vehicle drive and running gears
- Automotive friction systems
- Vehicle mechatronics
- Skill praxis M – MOB
- Vehicle support structures
- Vehicle testing
- Vehicle maintenance
- MSc thesis (Diploma work)

to possible ways for product improvement. Students will learn to use sophisticated methods to design and develop new or improved vehicles and/or components. To achieve this, students will be encouraged to develop the skills and attitudes needed to work effectively in a multidisciplinary design team.

As an automotive industry deals with the complex products, processes and constraints, engineers approach to motor vehicles' development cannot be based on the simple strategy of specifying 'good quality components'. Designing and assembling of motor vehicles with confidence involves quantifying the function and performance of systems and sub-systems. Working in the modern automotive industry cannot afford to ignore system approach in the process of vehicle's and/or its components' development. Accordingly, the motor vehicle's courses are designed to provide students with the knowledge and skills that links the bottom level component design to the top-level objectives, such as customer satisfaction and cost effectiveness.

The motor vehicles' courses are selected and designed to reflect:

- a top-down approach to the vehicle engineering topics,
- a 'systems thinking' framework, referring to motor vehicles lifecycle,
- a significant level of core technical engineering content, clear links between design, development, testing, and manufacturing of motor vehicles.



Motor Vehicles

“ Motor Vehicles provide knowledge and technical skills in a wide range of automotive disciplines such as systems approach to automotive design, development, and testing, in-depth knowledge in chosen areas through elective courses, and an attitude to exploring new areas of knowledge in the future! ”



Jelena Milojković
Graduate student in
Motor Vehicles



Industrial Engineering

“ I have chosen Industrial Engineering because of family tradition, and perhaps more importantly, I figured that it is relatively a new field and it has a pretty good grasp of how to cater to students’ interests and needs. ”



Saša Mihajlović
Graduate student in
Industrial Engineering

INDUSTRIAL ENGINEERING

Firstly, industrial engineering was concerned with improving the effectiveness of industrial operations using relatively simple time and motion studies and methods analysis. As industry became more complex, engineers also began to be involved in design of production facilities using plant layout procedures and in the development of quality and safety control techniques. With the dramatic advances in computer sciences, the industrial engineer was faced with larger and more complex management problems, which could be solved using the tools of operations research.

Today, industrial engineers are employed in all types of industry to design, improve and install systems using the methods and procedures of man, machine and materials. Mostly, they are concerned with production, although the analytical fact finding approach used today is applicable to almost any business or service enterprise.

The department curriculum is programmed to provide students with the skills required by modern industrial engineers, including analysis

of product design to determine the optimum manufacturing process, selection of equipment and design of layout, design and installation of systems for controlling production, inventory, quality or cost, job design and methods improvement, design of material handling systems, manpower utilization and work measurement and operations research.

In addition to disciplinary content, the Department also encourages students to attain expertise in the use of modern information technologies and take part in professional and extracurricular activities. As a result, our students are able to stand out in many international contests and activities.

Altogether, the goal of this department is to produce efficient industrial engineers with a high rate of technical ability, including practical as well as theoretical knowledge, in order to attain secure and responsible positions in competitive arena of industrial and service enterprise.

OBLIGATORY COURSES for MSc

- Production management 2
- Quantitative methods
- Industrial logistics
- Ergonomic design
- Engineering economy (with PPM)
- Skill praxis M – IIE
- Operations research
- Fundamentals of database systems
- Industrial management
- MSc thesis (Diploma work)

FOOD INDUSTRY ENGINEERING

Significant experience and knowledge of members of Department for Theory of Machines and Mechanisms in the field of food industry equipment, as well as the strategic commitment of the Government towards health food production, were the reasons for establishing Food Industry Engineering study module at the Faculty.

OBLIGATORY COURSES for MSc

- Product aesthetics (with ДУМ)
- Refrigeration equipment (with ТТА)
- Engineering condition monitoring
- Mechanisms and manipulators design
- Engineering economy (with ИИЕ)
- Skill praxis М – ПРМ
- Packaging machines
- Food processing machines
- Design of plants and process and energy systems (with ИБС)
- MSc thesis (Diploma work)

Although there was no study module in the past, a large number of students graduated at the Department working on research projects, since the Department is fully capable of giving significant contribution to development of new technologies and products in cooperation with industry. Our professors and students jointly patented and realized a lot of innovations and improvements. In cooperation with industry a number of production lines for bakery and sweets production as well as special machines and apparatuses, were produced and mounted. Foundation of the module was fully justified.

Study programmes on Master and PhD levels are research oriented and require theses to be completed. A typical master program contains lots of course work, with the second year devoted to research and thesis, plus additional courses.

The PhD program in food industry engineering sets the scientific standard. This doctoral program generally emphasizes courses for 3 semesters, after which the focus switches to a research needed for dissertation.

Since food industry engineers work at the interface between food materials and engineering, they must be knowledgeable in both disciplines. This mixture of engineering and food or biology is the distinguishing feature that makes food industry engineering unique among the engineering disciplines and provides the additional dimension of an understanding of life sciences.



Food Industry Engineering

“ Definitely high quality teaching! The Department has many excellent teachers, who collectively have huge teaching and research experience, some at the regional or European level. Our professors are also engaged in research in many exciting areas, besides food industry engineering. ”



Vladimir Čedić
Graduate student in
Food Industry Engineering

“Department of Production Engineering is an oasis at the Faculty of Mechanical Engineering. The opportunities, attention, and sense of unity are unrivalled by any other department. My choice to join the Production Engineering community was one of the best I made during my undergraduate years, and I'd recommend it to any newly admitted student, undergraduate or post-graduate.”



Matija Marjanović
Graduate student in
Production Engineering

PRODUCTION ENGINEERING

Production Engineering Department has created a contemporary school of production engineering that consists of three study programs: BSc, MSc and PhD studies. The curriculum covers three basic areas of production engineering with scientific content in the domain of techniques, technologies and cybernetics.

Production techniques relate to a wide spectrum of tool machines, robots and robotic systems, automatic assembly systems, measurement and control machines, flexible technological systems, working systems and other components and elements.

OBLIGATORY COURSES for MSc

- Manufacturing automation
- Industrial robots
- Manufacturing systems design
- Computer integrated systems and technologies
- Production information systems
- Skill praxis M – ППО
- New technologies
- Quality management
- Intelligent manufacturing systems
- MSc thesis (Diploma work)

Production technologies are based on a wide spectrum of different technologies, including computer technologies for process simulation and process design.

Production cybernetics includes CAD, CAM, CAE systems in the engineering design area of products and production, organization, planning and numeric control.

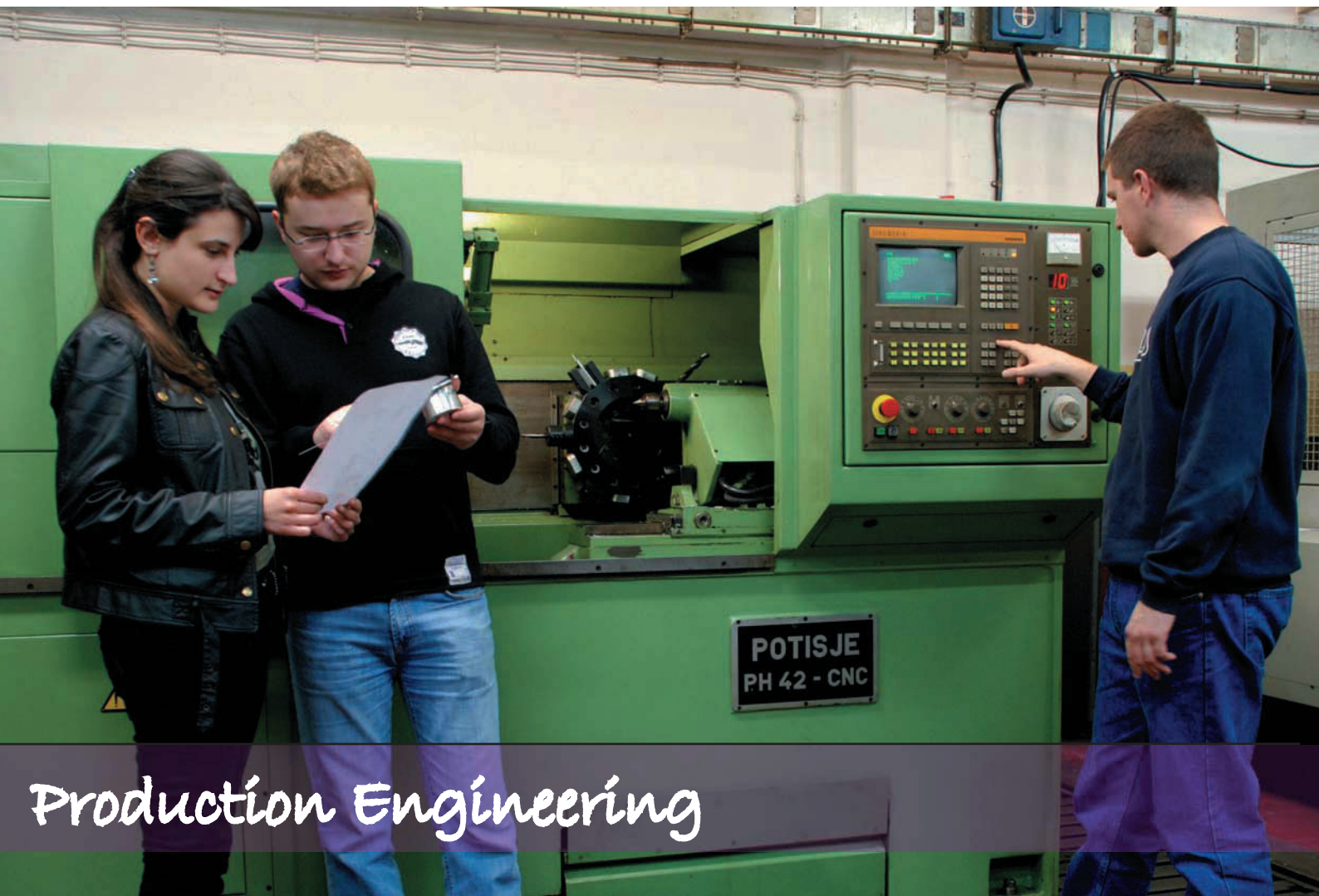
Programs of study are well rounded and balanced units, embracing methods of study and knowledge tests, study results and student competencies.

Department has at its disposal the facilities and equipment necessary for performing all forms of education at very high quality levels:

- Amphitheatre
- Classrooms
- Laboratories
- Library area

VISITING PROFESSORS

- Prof. Konstantinos-Dionysios Bouzakis, Aristoteles University, Thessaloniki
- Prof. Kornel F. Ehmann, Ph.D., Northwestern University, Evanston, Illinois



Production Engineering

CONTROL ENGINEERING

Study module involves teaching activities focused on the development of methodologies, algorithms and software for modelling, simulation, control and automation of complex apparatus and systems, plus their applications in many different areas.

The theoretical and applied research carried out at the department, has a significant impact on teaching process.

Research is concentrated on systems for identification, prediction and control of complex systems, along with their applications in the automotive and aerospace sectors, on new technologies for multi-company logistics, on software for simulation and robot control.

Within computer engineering, our research spans a wide range of areas from computer networks to computer graphics, from voice recognition systems to the architecture for arithmetic calcula-

OBLIGATORY COURSES for MSc

- Automation systems programming
- Automatic control
- Digital systems (with MIT)
- Nonlinear systems 1
- Linear system design
- Skill praxis M – CAY
- Nonlinear systems 2
- Control systems technology
- Object and process dynamics
- MSc thesis (Diploma work)

tion, from databases to software engineering, from electronic circuit design to CAD instruments which assist in planning.

The Department is committed to the development of teaching at all levels of university education, and to the continuing education of research and teaching staff.

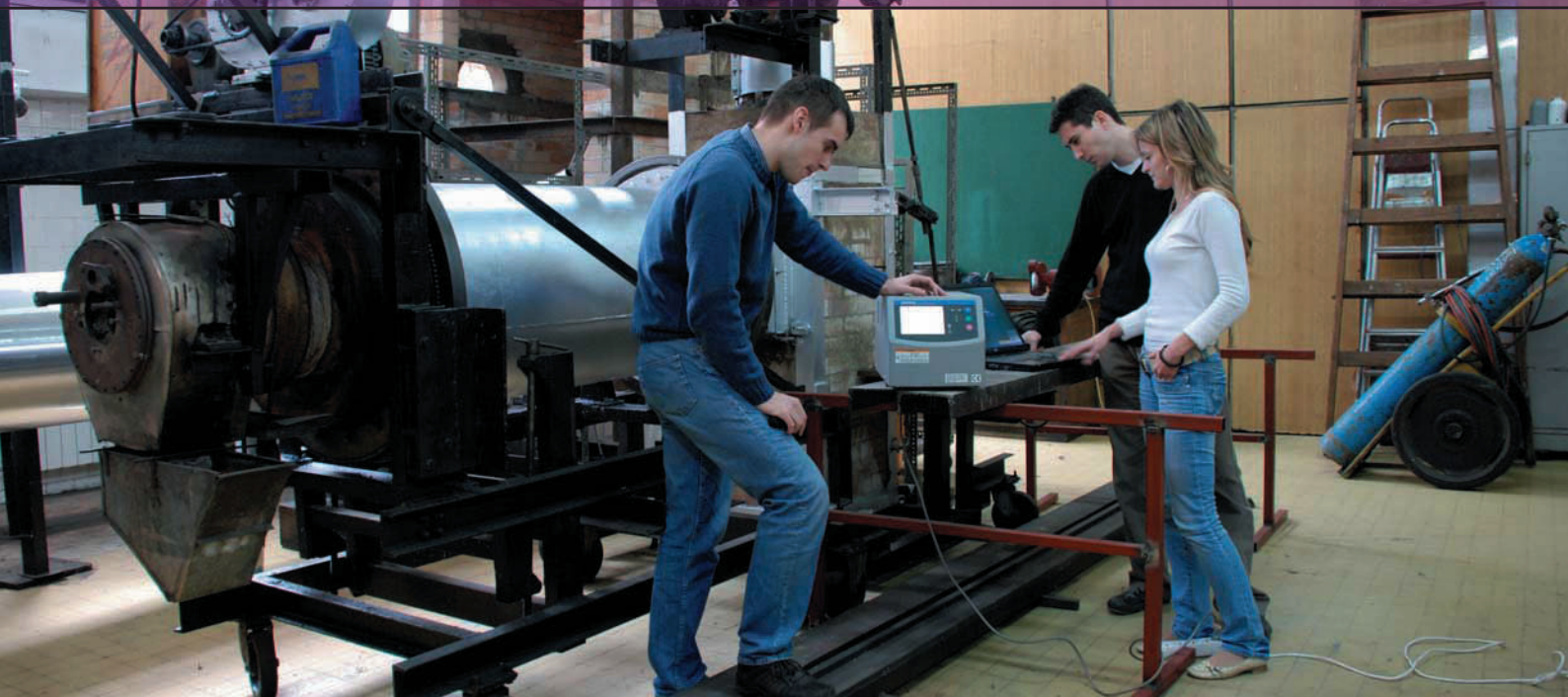


“The theory of systems is the most widely applicable scientific and engineering discipline and, as such, presents to the students a widest possible perspective for realizing their own professional goals and interests. The theory of automatic control systems focuses on developing means for optimal functioning of all industrial systems. Neural networks systems theory has the most interesting potential in this regard because it develops control systems into an area that efficiently models human thinking behavior.”

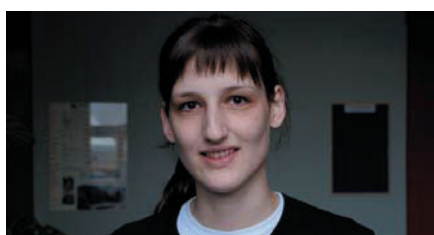


Minja Kostić
Undergraduate student in
Control Engineering

Process Engineering and Environment Protection



“While financial security should not be your only reason for choosing a career in process engineering, if you decide to become an engineer and after it licenced engineer you will be well paid. Engineering graduates receive the highest starting salary of any discipline.”



Vanja Majević
Graduate student in
Process Engineering

PROCESS ENGINEERING AND ENVIRONMENT PROTECTION

In its simplest form, process engineering is the design, development and management of a wide spectrum of industrial processes.

The following list of industries in which chemical engineers are employed provides a good indica-

tion of the diversity of the profession and the sort of work undertaken: oil refineries, chemical and petrochemical plants, energy production, food and drink processing, biotechnology, environmental health and safety industries, pulp and

OBLIGATORY COURSES for MSc

- Transport phenomena in process industry
- Mechanical and hydromechanical operations and equipment
- Heat transfer operations and equipment
- Energy in process engineering
- Concepts of environmental and workplace protection
- Chemical and biochemical operations and reactors
- Skill praxis M – PTTX
- Design, construction and exploitation of process plants
- Mass transfer operations and equipment
- Air pollution control
- Waste and wastewater management
- MSc thesis (Diploma work)

paper, pharmaceuticals, equipment manufacturing and plant construction, etc.

Department holds the majority of subjects dedicated to teaching and research in the field of process and environmental engineering. These subjects cover process design, unit operations and equipment, energy efficiency, pollution and waste management/control, etc.

Students can study process engineering and environment protection at all three levels of study - Bachelor of Science (BSc) - Master of Science (MSc) - Doctor of Philosophy (PhD).

After completing the bachelor level engineer should:

- have knowledge of relevant basic sciences (mathematics, physical chemistry, etc.)
- understand the basic principles underlying process engineering
- have a basic understanding of health, safety, and environmental issues
- have knowledge of some practical applications of process and product engineering.

After Master of Science graduation process engineer should

- use deeper knowledge of the underlying phenomena to build more advanced models
- be able to perform experiments and to give interpretations of the results
- be able to analyse, evaluate and compare relevant alternatives in the chosen orientation
- be able to synthesize and optimize novel solutions
- be able to self-study a topic in-depth.

During studies the students extensively use experimental facilities in our laboratory:

- basic process variable measurements, such as pressure, temperature, flow rate, fluid and solid properties, etc,
- unit operations and equipment, such as packed mass transfer column, heat exchanger, rotary furnace, hot wire reactor, fluidization, and venturi scrubber.

In order to achieve significant level of practical training, students are often taken to visit various process plants.

WEAPON SYSTEMS

Weapon Systems module provides a rich environment for undergraduate and graduate studies, supported by stimulating education and research projects applied to military technology. It has played decisive part in education of students – designers of weapon systems and defense equipment. Over 550 graduated engineers, more than 100 masters of science and dozens of doctors of science have conducted their research projects and presented their scientific theses at this Department.

The Weapon Systems Department offers comprehensive education in areas of classical weapon and rocket systems, as well as in scientific disciplines essential for study and research in complex multi-disciplinary fields involving: flight mechanics, projectile propulsion, explosive materials,

OBLIGATORY COURSES for MSc

- Physics of explosive processes
- Missile flight dynamics
- Missile aerodynamic
- Missile propulsion
- Launching equipment
- Interior ballistics
- Automatic weapons
- Design of projectiles
- Launching theory
- Skill praxis M – СИИ
- Artillery weapons design
- Missile guidance and control
- Missile design
- Fire control systems
- Terminal ballistics
- Optical devices and optoelectronics
- MSc thesis (Diploma work)

design of ammunition, etc. Good cooperation with other Departments within the Faculty of Mechanical Engineering and numerous military and civil research and development institutions provides high quality academic foundation for education in the field of defense technologies and weapon systems.

Special orientation of the Weapon Systems module is unique in our country and in the region. Also, it is the place where new technologies in the broadest sense are being studied, providing the students with multi-disciplinary knowledge in the field of weapon design, enabling choices within a variety of teaching subjects, allowing studies in smaller groups, offering good employment opportunities and other benefits.



Weapon Systems

Students of Weapon Systems are active, involved and innovative. They celebrate the tradition and history of the department alongside openness and diversity. They also happen to have the state-of-the-art equipment to work on and do research.

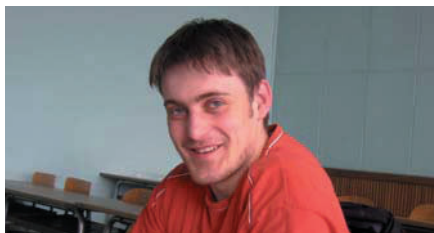


Marko Holclajtner
PhD student of
Weapon Systems



Thermal Power Engineering

“ You will have the opportunity to learn and grow through both theory studying and internships. Often, faculty will closely mentor you and help you tackle progressively more challenging tasks. You will learn from experienced engineers and will be offered seminars, short courses and internships to increase your knowledge. ”



Miroslav Trivunović
Graduate student in
Thermal Power Engineering

THERMAL POWER ENGINEERING

The study programme provides quality education for students entering the power engineering profession or seeking careers in this field, to advance to a scientific knowledge through basic and applied research, to disseminate technical information through scholarly publications and conferences, to advance to the profession through service within the associated societies and to promote activities which serve global development.

The programme focuses on processes and equipment of thermal and nuclear power plants, solutions to problems in design, manufacturing and operation of steam turbines, gas turbines, steam boilers, nuclear reactors, and energy efficiency solutions, as well as on all other aspects of thermal power engineering.

The educational objectives of the program are to produce graduates who can apply the principles of science and engineering, and are knowledgeable in thermal and mechanical systems. The students are educated to understand and investigate the relationships between thermal processes and thermal power equipment, to apply integrated designs, to communicate effectively and to demonstrate ability to function in multidisciplinary teams. Their skills include usage of modern engineering tools in design, investigation and analyses of processes, equipment and integral plants.

The Department encourages students to participate in research projects.

The courses in steam and gas turbines provide students with knowledge of thermodynamic cycles of steam and gas power plants, processes of heat conversion into mechanical energy, subsonic and supersonic gas and steam flows in turbomachinery, basic information on design and construction of turbomachinery, etc.

Through courses in the Design and exploitation of thermal power plants students are given information about energy plants, heat schemes, thermal power plant equipment, design and optimization of thermal power plants, and their operation and maintenance.

Within Energy steam boilers course students are taught of processes, design and construction of steam boilers.

Courses in nuclear engineering give students basic information on nuclear fuels, processes and equipment. Modern fission reactors and nuclear systems for steam production are examined. Special attention is paid to the thermal-hydraulic processes, modelling and numerical simulation of heat transport and two-phase flow.

Energy balances, planning and rational use of energy, as well as increase of energy efficiency are subjects in Planning of energy systems.

OBLIGATORY COURSES for MSc

- Steam turbines 1
- Energy steam boilers 1
- Steam turbines 2
- Thermal power plants
- Gas turbines
- Skill praxis M – TEH
- Planning in energy engineering
- Design and exploitation of thermal power plants
- Steam generators
- MSc thesis (Diploma work)

Besides the above mentioned obligatory courses, students can broaden their knowledge through elective courses, such as: Environmental protection in thermal power engineering, Industrial and communal thermal power plants, Nuclear reactors, Two-phase flows with phase transitions, Thermal-hydraulics and CFD, Turbocompressors, Pumps and ventilators, Pipelines, etc.

Research facilities include the Laboratory for steam and gas turbines, the Laboratory for heat turbomachinery, the Laboratory for the nuclear power plants and the Section for steam generators and nuclear reactors.

Material Handling, Constructions and Logistics

MATERIAL HANDLING, CONSTRUCTIONS AND LOGISTICS

In the field of material handling, constructions and logistics students explore methods for calculation and construction of machines in general, as well as designing industrial systems. Material handling, basic discipline on the Department, exists in every production and industrial process.

OBLIGATORY COURSES for BSc.

- Facility layout and industrial logistics
- Computer aided design in material handling practice
- Structural and stress analysis
- Material flow and logistics systems design
- Material handling and conveying machinery
- Skill praxis M – TKЛ
- Mining and construction machines
- Cranes design
- Eco design (with ДУМ)

The field of material handling machines consists of calculation, construction and design of conveyors, hoists, unloading bridges, cranes, elevators, cable-cars, excavators, etc. In addition, the Department is involved in research and studying of methods for plant lay-out and storages.

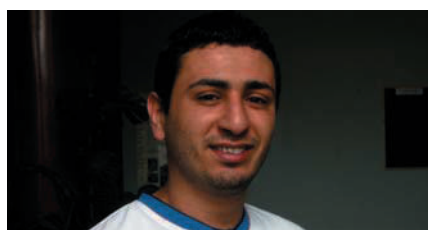
Structure analysis and simulation of machines for material handling is done with modern software packages based on 3D modelling and FEM (Finite Element Method)

OBLIGATORY COURSES for MSc

- Facility layout and industrial logistics
- Computer aided design in material handling practice
- Structural and stress analysis
- Material flow and logistics systems design
- Material handling and conveying machinery
- Skill praxis M – TKЛ
- Mining and construction machines
- Cranes design
- Eco design (with ДУМ)
- MSc thesis (Diploma work)



“ I chose this department because I felt that it was a welcoming environment where students and administration have similar ideas about how to build machines for community and work in progressive ways to make sure that everyone feels included. Also, working on the student council is a great way to make lasting friendships and enrich your time at school. ”



Hosam Elden Tumi
Undergraduate student in
Material handling, constructions
and logistics

“ Our professors teach us from the very beginning that: “Not a single drop of water should be released into the sea, before being of use for people”, which also represents the motto of our department. The oldest and the ecologically most acceptable form of energy generation, as well as major need for production of drinking water, made me choose hydropower engineering as my study module. ”



Bojana Bodiřoga
Graduate student in
Hydropower Engineering

HYDROPOWER ENGINEERING

Hydropower plants, machines and equipment, have various applications in many industrial areas such as: electro power industry, turbo machines production industry, hydro power plants, water supply factories, oil industry, chemical industry, turbo machines management and many others where applied fluid mechanics is important.

This points out that the necessities for hydropower engineers are evident and that is why there is a strong interest of students to study the module in Hydropower Engineering.

In addition to the thorough learning of the matter, students acquire knowledge from other me-

chanical engineering disciplines, so that they can involve in other domains of mechanical engineering, if necessary.

The study module in hydropower engineering is the only one in the country with contemporary teaching programmes at all three levels of studies - BSc, MSc, PhD. Research potential is based on modern laboratories and equipment. Students are very actively involved in all research projects with industry, other faculties and institutes, wherefrom a significant number of results is published in literature and applied in industry.

The Department prepares students to become practicing professional engineers who participate fully in activities of design, operation, production, maintenance, safety, marketing, sales and administration.

Particular strength of the Department includes complex and warranty measurements in pumps, compressors, fans and water turbines, as an independent national laboratory.

OBLIGATORY COURSES for MSc

- Theory of turbomachinery
- Pumps
- Hydraulic turbines
- Design computations in turbomachinery
- Fans and turbo-compressors
- Skill praxis M – XEH
- Hydropower plants and equipment
- Hydraulic torque converters
- Hydropower measurements
- MSc thesis (Diploma work)

Hydropower Engineering



Thermal Science Engineering

THERMAL SCIENCE ENGINEERING

The Thermal Science Engineering study curriculum provides the students with skills required for Heating Ventilating and Air Conditioning (HVAC) systems design and construction, for work in companies within the field of HVAC installations production, assembling, maintenance, and/or exploitation sectors, as well as for research and scientific work.

Final report (in BSc studies) and Master thesis (Diploma work) have to be taken from the list of courses passed by the students during the course of studies. Through the printed report defense, the student proves being capable of solving practical problems by applying knowledge acquired during the studies.

OBLIGATORY COURSES for BSc

- Pipelines
- Fundamentals of Steam Boilers
- Fundamentals of Refrigeration
- Fundamentals of Buildings' Heating

Our study programme is the most popular among mechanical engineering students, since the numbers of enrolled students and graduates are the highest ones at the Faculty.

OBLIGATORY COURSES for MSc

- Steam boilers elements and equipment
- Refrigeration equipment (with PPM)
- Steam boiler processes
- Refrigeration systems
- Fundamentals of air conditioning
- Skill praxis M – TTA
- Thermal power plants and heat plants
- Heat pumps
- Ventilating and air conditioning systems
- MSc thesis (Diploma work)

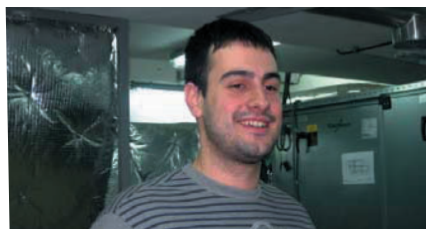
Students can benefit from our fruitful cooperation with the Norwegian University of Science and Technology (NTNU) – Trondheim, in which they can enroll to joint postgraduate studies, financially assisted by the Norwegian government.

Laboratory work with students as well as research work takes place in the Laboratory for Cooling devices and heat pumps and the Laboratory for heating and air-conditioning.

Laboratories have been formed so as to enable energy and exergetic measurements and analyses of HVAC and Refrigerating Devices and Plants. Within the scope of the District Heating Rehabilitation Programme, the new HVAC installations at the Mechanical Engineering Faculty are constructed also as demonstrating ones for the purpose of providing conditions for students' training.



“Most people know that engineering requires hard work and strong technical skills. As a member of such a respected profession, you will receive a high amount of prestige. An understanding of technology will provide you with a better understanding of many issues facing our society.”



Goran Stupar
Graduate student in
Thermal Science Engineering

“At the department class sizes are smaller than those at many other universities. You will enjoy closer contact with professors and more personal attention from the staff!”



Aleksandar Jerković
Graduate student in
Computational Engineering

VISITING PROFESSOR

- Univ.-Prof. Dr. Hans-Joachim Bungartz,
TU München, Fakultät für Informatik

COMPUTATIONAL ENGINEERING

The master's program on Computational Engineering is open for students with a bachelor or a diploma degree in engineering (civil, mechanical, electric, chemical, or process engineering, for example) and it is organised with support of Technical University of Munich (TUM).

The program's duration is four semesters. The first three semesters are dedicated to lectures, tutorials, and seminars. The fourth semester is reserved for the Master's thesis. To forge links to applications of CE in industry, an industrial internship (skill praxis) has been included after the first year.

OBLIGATORY COURSES for MSc

- Programming
- Scientific Computing 1
- Numerical Analysis 1
- Scientific Computing 2
- Algorithms
- Software Engineering
- Skill praxis M – CEM
- Numerical Analysis 2
- Parallel Numerics
- High Performance Computing
- Scientific visualisation
- Master thesis

After a successful completion, students are awarded the degree “Master of Science”. This degree entitles to study towards a doctoral degree without having to meet any additional academic requirements.

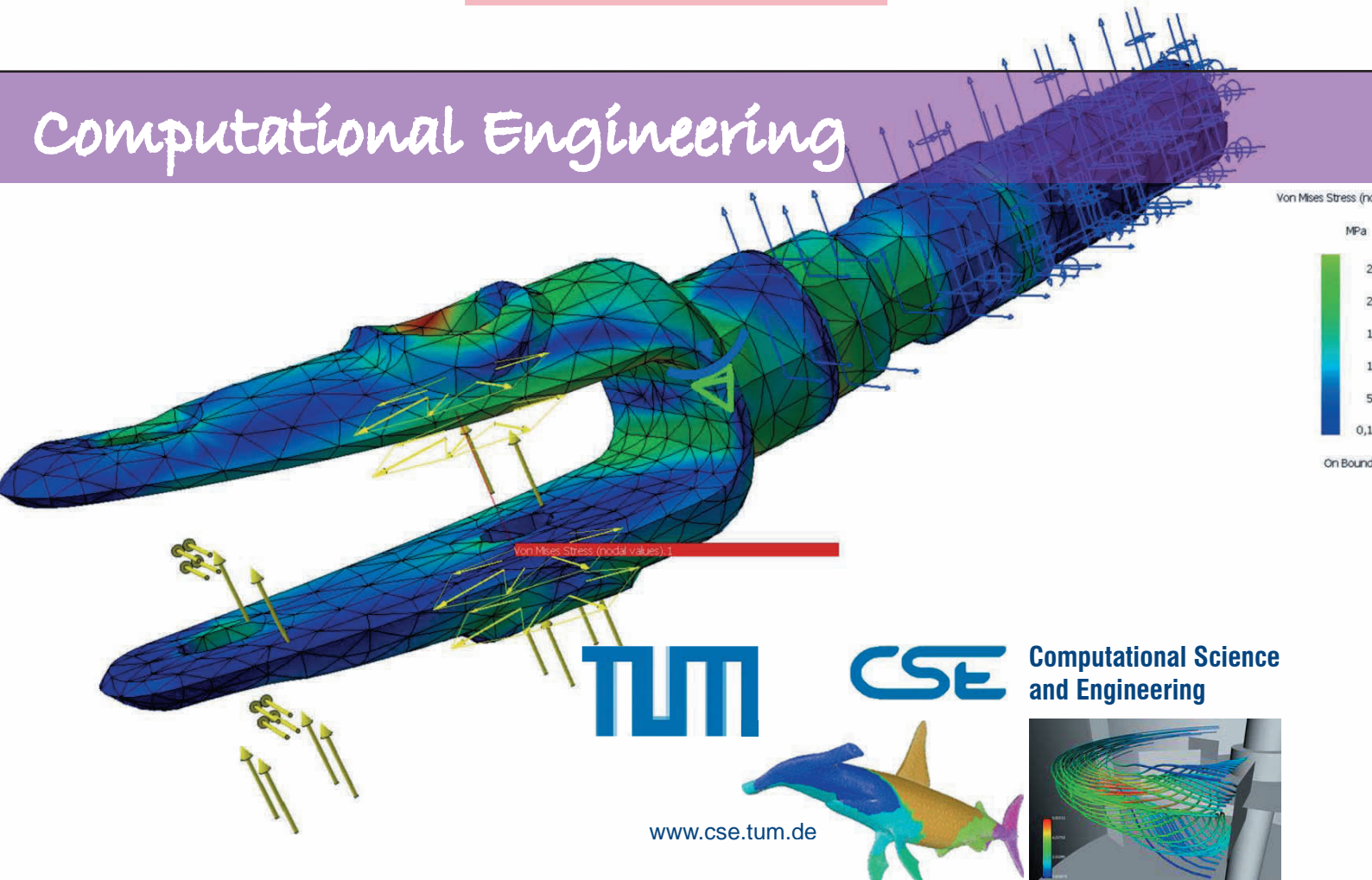
The Master's Program is an interdisciplinary course. Besides giving an introduction to the basic subjects “Programming” and “Numerical Analysis”, the program will provide insight into different important fields of applications of scientific computing.

All mandatory courses of the program are held in English. Courses are provided by remote partner institute (TUM). These courses are realized as block courses in Belgrade.

Students work on projects, such as “Relativistic rendering of an artificial geometry”, “Optimal guidance and control of full car systems”, etc.

Our students implement their knowledge in areas, such as: Computational Fluid Dynamics, Computational Structural Mechanics, Optimal control in Aero and Astronautics, Computational Physics, Computational Chemistry, Computational Electronics and Computational Biomechanics.

Computational Engineering



Departments

University of Belgrade
FACULTY OF MECHANICAL ENGINEERING



Production Engineering

The Department of Production Engineering and Center for Advanced Technologies are founders of a science, technological and educational programme that is based on the development of science and production engineering worldwide, primarily developed countries, based on our own research and, also, based on our industrial-business complex development.

Production engineering area today represents the technological basis of the overall industrial development, which should support conquering new technologies while generating opportunities for highly productive jobs. Competitive engineering philosophy assumes the development of new generations of plants and products.

STAFF 11 professors, 9 teaching and research assistants, 3 associates
DATE FOUNDED 1948
DISTINGUISHED ALUMNI

- Prof.Dr. Vladimir Šolaja, Institute of Machine Tools
- Prof.Dr. Milisav Kalajdžić, Long-term Head of the department
- Dr. Nebojša Čović, President, FMP Belgrade
- A.I. Kosicki, writer of first textbook in Serbian for Production Engineering

COOPERATION WITH FOREIGN UNIVERSITIES

- University of Strathclyde, University of Birmingham, University of Manchester, United Kingdom
- Northwestern University, USA
- Università di Palermo, Italy
- Technische Universität Berlin, Germany
- Aristoteles University Thessaloniki, Greece

Production engineering department has created the educational and science activities with the following goals:

- to provide industry and other fields with highly qualified and skilled engineers, capable of solving complex problems in the area of production engineering – from design and planning to control on all levels from plant to complex industrial systems;
- to develop highly creative engineers capable of development and internationalization of all the activities in appropriate technological fields;
- to ensure active student involvement in the learning process, especially in the research labs, while maintaining the appropriate level of study efficiency;
- to continually improve the study program.

Production Engineering Department has created a contemporary school of production engineering that consists of three scholastic programs: BSc, MSc and PhD studies.

The goals of the curriculum include achieving competencies and academic skills as well as methods for their acquiring. They also include development of creative skills and mastering of specific practical skills necessary in the professional practice.

The Department and the Center for Advanced Technologies research consists of long term programmes defined through research projects supported by industry and the Ministry of Science and it is being conducted within the existing laboratories for:

- Structural analysis (CAE),
- Manufacturing processes (Automation),
- Information technologies and production con-

trol (CIM),

- CAD/CAM systems,
- Flexible manufacturing systems, working processes and tools (FMS),
- Industrial robotics and artificial intelligence (Robotics and AI) and
- Production metrology and quality (CAQ).

List of our completed projects (reference list):

- EUREKA Project PAKICUT E!3239: Development of Parallel Kinematic Device Integrated into 3-axis Milling Centre to enable Multi-axis Cutting Processes.
- Research and Design of contemporary production management systems and development of new engineering methods and techniques for product and manufacturing design.
- Application and development of new tools in stone (marble and granite based) machining technology.
- Automated Design Implementation of Machining Systems and Processes in Metal Working Industry
- Programmable automation for metalworking industry (PAMI)

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Full Professors:

Dr. Žarko Spasić, Dr. Pavao Bojanić, Dr. Miroslav Pilipović, Dr. Vidosav Majstorović, Dr. Dragan Milutinović, Dr. Ljubodrag Tanović, Dr. Bojan Babić, Dr. Miloš Glavonjić.

Associate Professors:

Dr. Petar Petrović, Dr. Zoran Miljković.

Assistant Professor (Dozent):

Dr. Radovan Puzović.

Teaching and Research Assistants:

Mgr. Branko Kokotović, Mgr. Saša Živanović, Mgr. Goran Slavković, Mgr. Božica Bojović, Mgr. Mihajlo Popović, Mgr. Radomir Ivanović, Mgr. Živana Jakovljević, Mgr. Nenad Nešić, Mgr. Borislav Kovljenić.





Material Handling, Constructions and Logistics

The Department of Material Handling, Constructions and Logistics is one of the first departments established in the Faculty of Mechanical Engineering at University of Belgrade. Our history starts even further in the past (1897), with the course of Machines for Civil Engineering.

STAFF 5 professors, 3 teaching and research assistants

DATE FOUNDED 1946

DISTINGUISHED ALUMNI

- Prof. Valerijan Marković, First Chief of Department

- Prof. Petar Micić, Innovations in Metal Constructions

- Prof. Aleksej Lebedev, Innovations in Construction Machinery

COOPERATION WITH FOREIGN UNIVERSITIES

- Vienna University of Technology, Graz University of Technology, Montan University, Leoben, Austria

- Ryerson University, Toronto, Canada

- Georgia Institute of Technology, Athens, USA

- University of Ljubljana, Slovenia

AWARDS

3 for best technical innovations, 2 for diploma thesis, 1 for ScD dissertation

Scientific conference MHCL

COOPERATION WITH INDUSTRY

GOŠA, Smederevska Palanka

Kolubara Metal, Vreoci

KRUPP, Germany

TAKRAF, Germany

Thermal Power Plants Nikola Tesla, Obrenovac

Mines Kolubara, Lazarevac

LaFarge, Beočin

JKP Vodovod, Beograd

Nowadays, our Department is committed to scientific research and applicative development in the areas of: structural analysis, mechanical and computer aided design, material flow, conveying machines, mining and construction machines and industrial logistics.

The basis of our activities is teaching, where we try to help our students on their way to become successful engineers. Following contemporary educational trends, we offer them modern working environment with theoretical assistance, along with strong computer aided back-up. We consider them as partners in constant improvement of design and research processes in the field of material handling machines. We commit ourselves to make our courses as strong support for their future engineering practice. Our goal is to enable every student, after completing the courses, to work on diploma thesis related to practical industrial needs, and we make significant contribution to shape them as future leaders in the area of production of material handling machines.

The Department is, for 30 years, the organizer of International Conference on Material Handling and Logistics - MHCL. The aim of the Conference is to be a forum to exchange views, opinions and experience on MHCL from technical viewpoints in order to track the current achievements, but also to look for future developments. Also, one of the main goals of the Conference is to make scientific/research exchange between similar academic Departments and Institutes from different countries.

Furthermore, our commitment is full cooperation with industry. More than 600 realized projects

for domestic and foreign industry prove this point. Our goal is to use team cooperation to create innovative technical solutions for our industry partners' satisfaction.

The list of our main projects (reference list):

- Design of reconstruction of coal unloading bridge, Kolubara
- Design of temporary support structure for gas oil tank, Port of Bengazi
- Design of reconstruction of bucket-wheel drive system, Kolubara
- Design of reconstruction of production line, BFC, LaFarge
- Design of erection of the bucket wheel excavator, ThyssenKrupp
- Design of erection of the spreader, Takraf
- Design of gantry crane, Shipyard Begej
- Design of bridge crane, Le Belier Kikinda

Our research facilities include:

- Laboratory for testing and certification of material handling machines

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Web site: www.mehanizacija.com



Full Professors:

Dr. Slobodan Tošić, Dr. Zoran Petković.

Associate Professor:

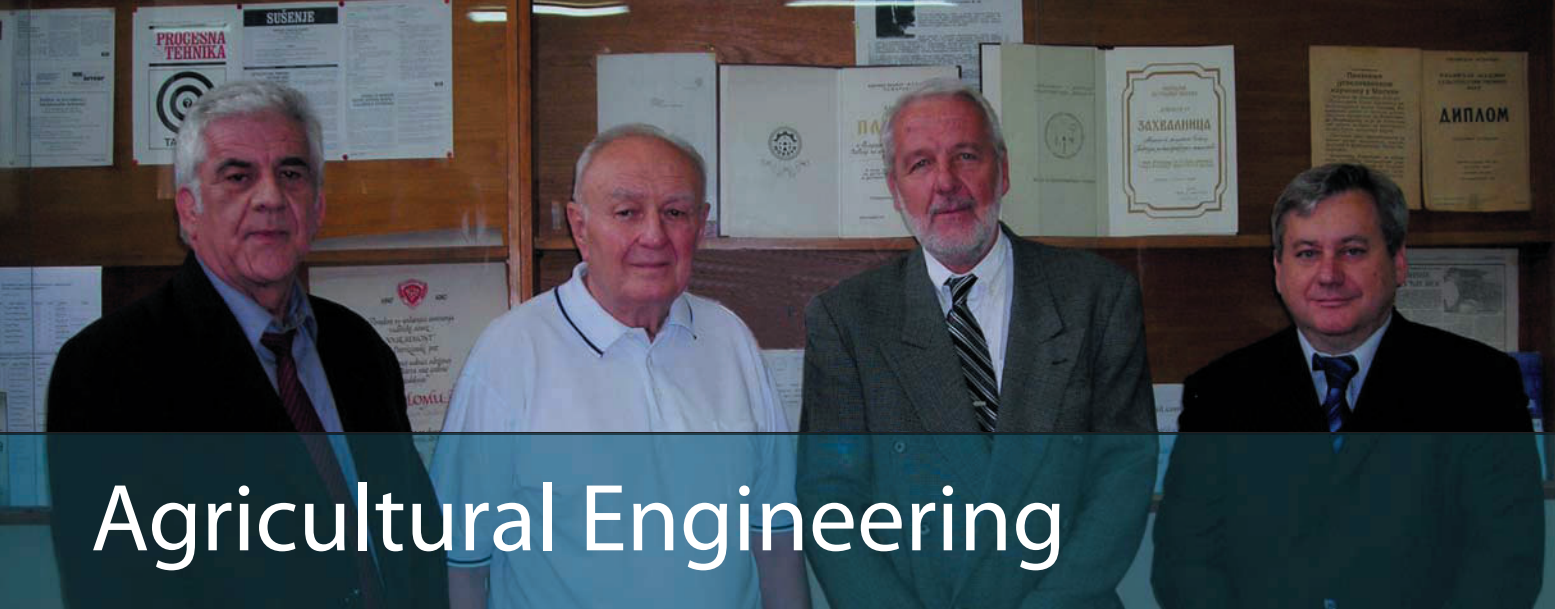
Dr. Srđan Bošnjak.

Assistant Professors (Dozents):

Dr. Nenad Kosanić, Dr. Nenad Zrnić.

Teaching and Research Assistants:

Mgr. Aleksandar Brkić, Mgr. Vlada Gašić, Dipl.Ing. Nebojša Gnjatović.



Agricultural Engineering

In the past, people could tillage only about half a hectare of ground per day, but today it is possible to tillage over 321 hectares for 24 hours by useful modern machinery, plants and equipment. Would it be possible today to feed humanity which is more populated than one or two centuries ago? And would that be possible in the future if engineers would not develop machinery for ground tillage, cultivation and harvesting of sowing and processing of food?

The main goals and primary task of humanity and scientists all over the world are production of energy, production of food, and ecology. The Department of Agricultural Engineering acts just according to this course.

If you want to produce feeds, then machinery, plants and equipment are absolutely necessary, but you can control them only if you have knowledge about them... The way from furrow to food table is very long, through fields and

factories, and it is achievable only through machines. We lead our students through areas of knowledge, practice and science about agricultural machinery. We help our students to adjust all elements in the area of biotechnical systems engineering, in the area of production and processing of food, and to realize their knowledge in practice ensuring their engineering status.

Performances of department in domain of education and research in industry are:

- high-level student education (mentor work);
- development of software, new technologies and solutions for pursuing more operations in one pass;
- development of precision farming concept;
- automation of service machines, units and equipments;
- participation with projects in domestic and foreign congresses, magazines, published books, etc;
- active cooperation with reputable international institutions and attendances to foreign and domestic fairs;
- design of agricultural machinery;
- design plants and process and energy systems;
- plant design for food production and processing and design of driers.

Our research facilities include:

- Laboratory for construction development of agricultural machinery.
- Laboratory for energy and processing plants and alternative energy sources.
- Centre for plant and agricultural machines designing.
- Laboratory for exploration, measurement tech-

niques and applying of computers.

- Laboratory for maintenance, protection and repair of mechanical parts.

Instruction is performed by contemporary research method, with a variety of laboratory practices, by using computer techniques and involving students in research projects.

Cooperation with foreign companies, (KVERNELAND, JOHN DEERE, CLAAS, KRONE, etc), is established through students' study trips and excursions. The Department performs technical, practical and educational collaboration with domestic companies: PKB - Belgrade; FRIKOM - Belgrade; IMT - Belgrade; ZMAJ - Belgrade; MORAVA - Požarevac; CER - Čačak,...

STAFF 3 professors, 1 research assistant, 1 associate

DATE FOUNDED 1948

DISTINGUISHED ALUMNI

- Prof. Vlastimir Novaković, Long-term Head of the Department

- Prof. Stevan Marković, First Lecturer

COOPERATION WITH FOREIGN UNIVERSITIES

- Institute Wageningen, Holland
- Northwestern University, USA
- Angel Kanchev University, Rousse, Bulgaria
- Technische Universität Dresden, Germany
- Institute IMAS, MGAU, VISHOM, MTILP, Moscow Russia
- European Federation of Chemical Engineering, Working Part of Drying (EFCE-WPD)

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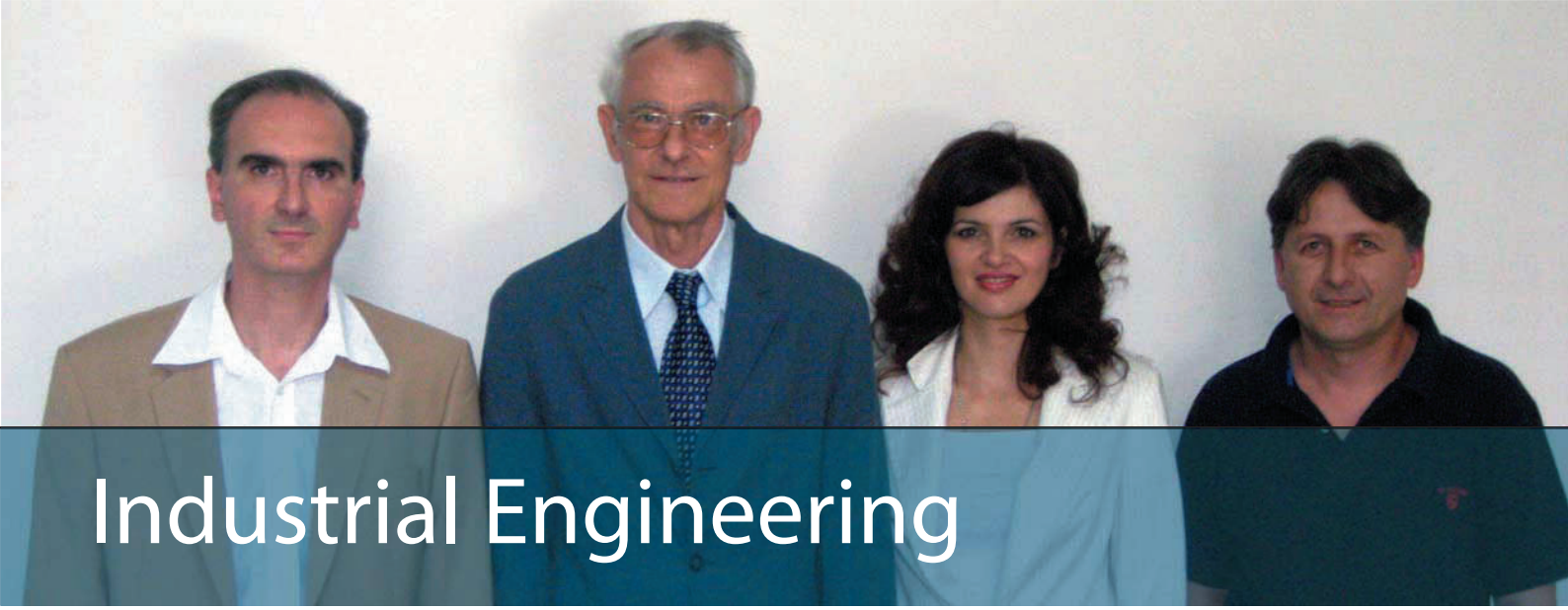
Full Professors:

Dr. Milan Veljić, Dr. Radivoje Topić, Dr. Dragan Marković.

Research Assistant:

Dipl. Ing. Žarko Čebela..





Industrial Engineering

The basic activity of the Industrial engineering department is related to the development, improvement, implementation, evaluation and optimization of integrated systems consisted of machines, men, information, energy, money and material. About 55 years ago the department started with the development of pertaining scientific areas, which form the basis of industrial engineering. At that time, the first lectures in the field of scientific organization work were presented by Prof. Dr. Vukan Dešić. He was a dean of the Faculty of Mechanical engineering in Belgrade in 1955. His original complex analytical method for determination of the company's organizational level is well-known.

The name of Industrial engineering for the department has been in use since 1990. Teaching

contents is analog to industrial engineering programmes in the United States. This has been also confirmed by the president of the Industrial engineering institute Prof. Dr. Frank Cotton in his comparative study. Since 1990, hundreds of mechanical engineers graduated at the Industrial engineering department, whereby a certain number of postgraduate students also got doctor's degree.

The Industrial engineering department continues to follow state of the art in the industrial engineering area worldwide. According to this cognition, we formed the newest programme of Industrial engineering department, which is compatible with the majority of programmes of this kind in Europe and United States.

The Industrial engineering department cherishes the mechanical engineering profile that besides a basic knowledge from the production domain possesses other specific knowledge, necessary to the engineers in a daily work and practice. The managing personnel in industrial companies, almost without an exception, engage knowledge gained in the industrial engineering domain. The Department also practices multidisciplinary approach to problem solving, whereby it accomplishes the comprehensively and qualitatively solution. As a result of such approach, graduated engineers from our department find employment in other branches (such as finance, management, banking), besides industry.

Two laboratories are at students' disposal. The first one is the computer laboratory and the other one is for the ergonomics and maintenance equipment.

Some of research activities of the Industrial engineering department relate to the work organization, analysis, improvement and optimization of production processes, maintenance of production equipment, analysis of economy indicators, increasing the productivity, designing of information system, designing of decision support information systems, quality management, logistics, ergonomic designing of product, transport facilities, power systems, production equipment and process, communication devices, traffic systems, devices and apparatus for the daily usage, as well as the work safety systems.

We have realized a great number of projects in cooperation with industry. Large industrial systems and firms from Serbia (such as NIS Jugopetrol, Ikarbus, Krušik, etc), appear as clients.

The Department organizes International symposiums of Industrial engineering. We are also founders of the Industrial engineer association, allowing the exchange of information and experiences between graduate industrial engineers, and also making possible the continuation of cooperation with the parent department.

STAFF 10 professors, 1 teaching and research assistant

DATE FOUNDED 1955

DISTINGUISHED ALUMNI

- Prof. Vukan Dešić, Founder of the department

COOPERATION WITH FOREIGN UNIVERSITIES

- Universidade Nova de Lisboa, Portugal
- University of Southern California, Los Angeles, Purdue University, West Lafayette, USA
- Aachen University of Technology, Institut fuer Produktionstechnik und Automatisierung, Stuttgart, Germany
- University of Banja Luka, Bosnia and Herzegovina

COOPERATION WITH INDUSTRY

- US Steel, Smederevo
- VEA Comp, Belgrade
- Union Lift, Beograd

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Full Professors:

Dr. Milivoj Klarin, Dr. Slobodan Pokrajac.

Associate Professors:

Dr. Dragan D. Milanović, Dr. Nikola Dondur.

Assistant Professors (Dozents):

Dr. Dragan Lj. Milanović, Dr. Zorica Veljković, Dr. Aleksandar Žunjić, Dr. Mirijana Misita, Dr. Uglješa Bugarić, Dr. Dušan Petrović.

Teaching and Research Assistant:

Mgr. Vesna Spasojević.



Mechanics

The Department of Mechanics promotes, coordinates, and runs teaching services, research and its role as consultant in the field. The Department covers the functional and structural planning of all types of mechanical systems and devices, the fundamental inherent phenomena involved, their applications in various areas, their development and their integration in complex systems.

The progress of technology confronts the engineer with a wide variety of problems connected with structural design (buildings, bridges, canals, dams, etc.), the design, manufacture and operation of various machines, motors and means of locomotion, such as automobiles, steam engines, ships, aircraft, rockets, and spaceships. Despite the diversity of problems that arise, their solution, at least in part, is based on certain general principles common to all of them, namely, the laws governing the motion and equilibrium of material bodies. The science which treats the general laws of motion and equilibrium of material bodies and resulting mutual interactions is called theoretical, or general, mechanics. Theoretical mechanics constitutes one of the scientific bedrocks of

modern engineering. Mechanics, in a broad sense of the term, may be defined as the science that deals with the solution of all problems connected with the motion of equilibrium of material bodies and the resulting interactions between them. Theoretical mechanics treats the general laws of motion of material bodies. i.e., laws which apply equally, for example, the earth's motion around the sun or the flight of a rocket or an artillery projectile. Other branches of mechanics cover a variety of general and specialized engineering disciplines treating the design and calculation of specific structures, motors and mechanisms as their parts. All these disciplines are based on laws and methods of theoretical mechanics.

The principal areas of research are: statics, kinematics, dynamics, vibration analysis, dynamics analysis of mechanical systems, functional analysis of machinery and its components, experimental mechanics, mechatronics, theory of optimal control, continuum mechanics and micromechanics. The Research staff at the Department is constantly involved in research programmes of national importance funded by the Serbian Ministry of Science. There are also international research programmes in collaboration with several respected universities all around the globe. The Department staff teaches courses held at the Faculty of Mechanical Engineering, and is also involved in the Ph.D. degree in the field of Mechanics in collaboration with the Faculty. Teaching syllabuses pay particular attention to work in theoretical mechanics and vibrations. Doctoral Theses are offered by the Department in mechanics

STAFF 13 professors, 1 teaching and research assistants

DATE FOUNDED 1905

DISTINGUISHED ALUMNI

- Prof. Danilo Rašković, Famous lecturer
- Prof. Svetopolk Pivko, Famous lecturer
- Prof. Ljubodrag Radosavljević, Famous lecturer

COOPERATION WITH FOREIGN UNIVERSITIES

- Moscow State University MGU, Russia
- Georgia Tech University, Atlanta, USA
- Technical University of Budapest, Hungary

“If I have been able to see further, it was only because I stood on the shoulders of giants.”



Sir Isaac Newton (1643-1727)

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Full Professors:

Dr. Vukman Čović, Dr. Zoran Golubović, Dr. Dragomir Zeković, Dr. Nikola Mladenović, Dr. Zoran Mitrović.

Associate Professors:

Dr. Mirko Pavišić, Dr. Velimir Radosavljević, Dr. Aleksandar Obradović, Dr. Mihailo Lazarević.

Assistant Professors (Dozents):

Dr. Zoran Stokić, Dr. Olivera Jeremić, Dr. Nataša Trišović, Dr. Dragutin Đurić.

Teaching and Research Assistant:

Mgr. Aleksandar Simonović.





Theory of Mechanisms and Machines

The Department for Theory of Machines and Mechanisms was founded in the seventh decade of the last century. Next 15 years were filled with intensive activities in the field of scientific research and lecturing development. In that period over 300 students graduated making their final works working in scientific and engineering fields the Department was dealing with.

In the middle of the eighth decade the Department started activities for founding the Food Industry Engineering module in which a great number of projects was successfully realized. Finally, we made it possible.

We patented and realized a lot of innovations and improvements in cooperation with domestic industry a number of production lines for bakery and sweets production as well as special machines and apparatuses. Some of these are:

- Packaging machine for hard and viscous materials (this packaging machine was developed for food industry. It is based on thermoplastic forming of containers).
- Production line for multi layer cakes (this pro-

duction line was developed for the factory Banini, Kikinda. It is very flexible and has a very wide range of applications).

- Production line for hard cakes and crackers (this line was developed for domestic and foreign food industry. For this purpose 7 original and patented machines were developed. A special PLC based control system for synchronizing machines in the production line was developed).

The scientific and engineering potential of the Department is in its team.

Laboratory exercises, engineering and research activities are carried out in the Center for Machine Mechanics consisting of 5 units:

1. Laboratory for Mechanism
2. Laboratory for Machine Dynamics
3. Laboratory for Mechatronics
4. Laboratory for Development, design and automatization of machines for food industry, and
5. Laboratory for Engineering Graphics.

In the Center for Machine Mechanics a number of machines for dynamic balancing of rotors was developed, designed and produced.

Thanks to engineering results, patents and scientific research the Department has a great authority in Europe and the World, especially through the International Federation for Theory of Machines and Mechanisms – IFToMM (Prof. Todor Pantelić was one of the founders of IFToMM in Varna in 1965).

One of the most significant projects was realized in cooperation with The Bakery and Sweets Institute of former Soviet Union. Equipment, which was designed in our Department, showed much better performance than the equipment of various famous producers. Complete new machines

and production lines were developed according to customer request.

“Mathematicians have tried in vain to this day to discover some order in the sequence of prime numbers, and we have reason to believe that it is a mystery into which human mind will never penetrate.”



Leonhard Euler (1707-1783)

STAFF 6 professors, 3 teaching and research assistants, 4 associates

DATE FOUNDED 1979

DISTINGUISHED ALUMNI

- Prof. Todor Pantelić, Famous lecturer and innovator

COOPERATION WITH FOREIGN UNIVERSITIES

- Technische Universität Darmstadt, Germany
- Concordia University, Montreal, Canada

COOPERATION WITH INDUSTRY

- Banini, Kikinda
- Centroprodukt, Belgrade

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Web site : <http://www.mas.bg.ac.yu/>



Full Professors:

Dr. Stevan Đorđević, Dr. Aleksandar Veg.

Associate Professors:

Dr. Miodrag Stoimenov, Dr. Ljubomir Miladinović, Dr. Dragan Petrović.

Assistant Professor (Dozent):

Dr. Branislav Popkonstantinović.

Teaching and Research Assistants:

Mgr. Raša Andrejević, Mgr. Zorana Jeli, Mgr. Goran Šiniković.



Thermal Science Engineering

The Department of Thermal Science sees itself as a centre of scientific research and application development in the areas of: Heating, Ventilating, Air-conditioning, Refrigeration, Steam Boilers and Thermal Power Stations.

The Department of Thermal Science Engineering has a long and rich history, which originates with the first subject named Mechanical technology with heating and ventilating introduced at the Lyceum, that is the Great School in 1904. The name of the subject Heating and ventilating appears for the first time in 1923. The subject Air-conditioning was introduced in 1966 and has been taught ever since.

STAFF 5 professors, 3 teaching and research assistants

DATE FOUNDED 1904

DISTINGUISHED ALUMNI

- Prof. Dr.h.c Mladen Popović, Famous lecturer
- Prof. Dr. Branislav Todorović, Famous lecturer
- Prof. Dr. Milorad Urošević, Famous lecturer
- Prof. Dr. Sava Vujić, Famous lecturer
- Prof. Dr Mile Markoski, Famous lecturer
- Prof. Dr Predrag Hrnjak, Famous lecturer

COOPERATION WITH FOREIGN UNIVERSITIES

- Chalmers University, Sweden
- University of Liege, Belgium
- University of Loughboro, United Kingdom
- University of Kansas, Lawrence, University of Missouri, Rolla, USA

COOPERATION WITH INDUSTRY

- Hyatt Regency
- Airport Belgrade, Railway station Belgrade, Serbia
- Ministry complex, Kuwait

The course Steam boilers was introduced at the Technical faculty of University of Belgrade in 1919. Nowadays there are several courses referring to steam boilers and power plants, such as: Fundamentals of Steam boilers, Steam boilers elements and equipment, Steam boilers processing, Energy Steam boilers and Thermal power plants and heat plants.

Refrigeration technique has been taught since 1948. The name of the first subject Refrigeration machines was changed into Cooling devices later on. In 1966 the new subject was introduced Design of industrial cooling devices which was replaced with Refrigerating plants and heat pumps as obligatory course in 1999.

Pipelines were introduced in 1973 as an obligatory course for the students of Thermal Science engineering and Thermal power engineering.

The Department of Thermal Science Engineering is capable of making significant contribution to development and modernization of industry in the field of HVAC, aiming at achieving competitiveness of their products at the world market. We can take over and perform complex and responsible design tasks for the Serbian operative units abroad, having the increased export of our products as an indirect outcome. Direct cooperation with R&D experts in industry has proved to be the most effective way to mastering new products, and to technological development and progress. The Department cooperation with firms and industry results in numerous general and main designs, expertises, revisions, expert's reports and laboratory measurements.

Within the scope of scientific and research work of our Department all of the members are engaged in elaborating energy efficiency research projects financed by the Ministry of Science. Given the limited energy resources of our country, the Department of Thermal Science Engineering is fully capable of playing the pivotal role in planning and implementation of the program for rational energy consumption and the increased energy efficiency.

Our cooperation with Universities from the former Yugoslav Republics is developed in the form of giving lectures at graduate (Banja Luka) and postgraduate studies (Bitolj, East Sarajevo), and membership of commissions for MSc and PhD theses defence (Ljubljana, Skoplje, Bitolj).

Fruitful is our cooperation with the Norwegian University of Science and Technology (NTNU) – Trondheim, the result of which are joint post-graduate studies, financially assisted by the Norwegian government.

Such a cooperation enables continuity in permanent professional upgrading of our cadre, and provides them possibility of having insight into and keeping pace with professional developments abroad.

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Full Professors:

Dr. Titoslav Živanović, Dr. Franc Kosi.

Associate Professors:

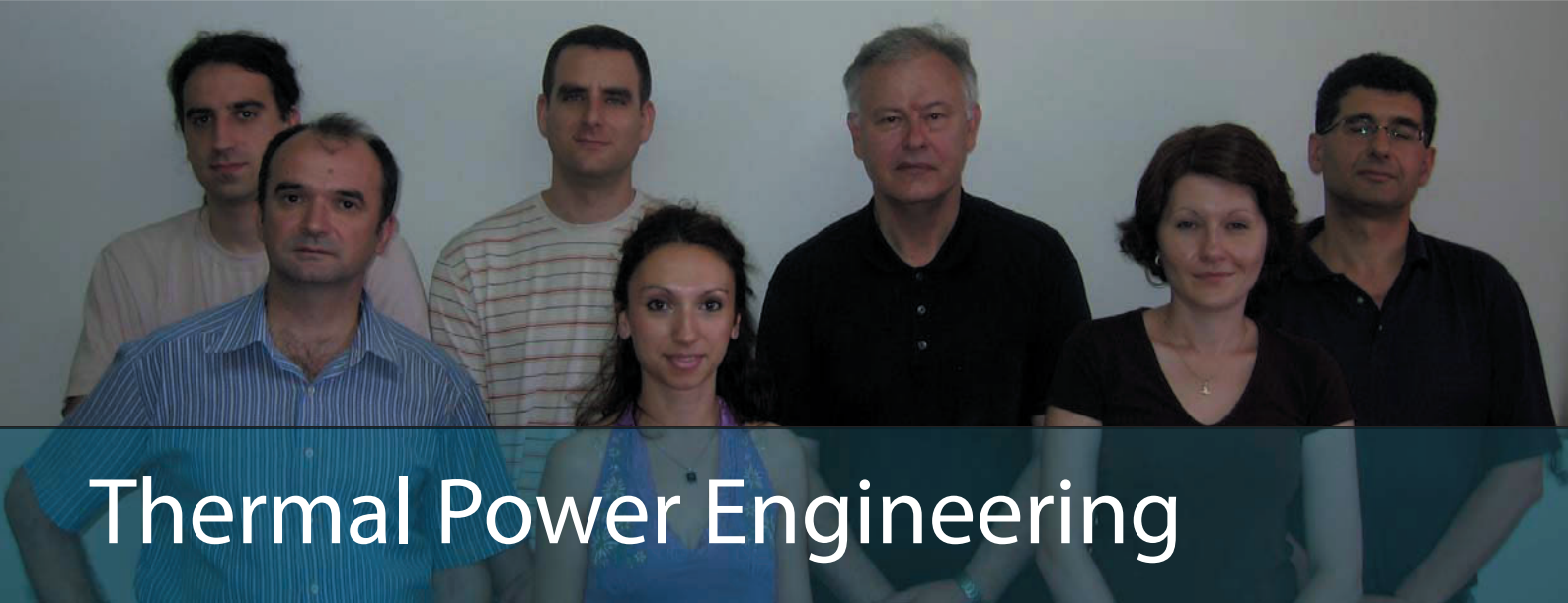
Dr. Branislav Živković, Dr. Dragan Tucaković.

Assistant Professor (Dozent):

Dr. Maja Todorović.

Teaching and Research Assistants:

Mgr. Vladimir Bekavac, Dipl. Ing. Radoslav Galić, Dipl. Ing. Jela Burazer.



Thermal Power Engineering

The Department of Thermal Power Engineering is devoted to the education, research and development of processes and equipment related to the thermal and nuclear power plants, steam and gas turbines, steam generators, and other thermal power equipment. Nowadays, when the environmental protection and the reduction of greenhouse gases emission are the highest imperatives, the mission of the Department is also to improve the energy efficiency of thermal

energy production and conversion, as well as to increase the safety and reliability of thermal and nuclear power plants. Rational use of energy and energy planning and policy are also our research areas.

Thermal Power Engineering is recognized as one of the most important parts of the country's energy system, which influences the overall economy. In Serbia 2/3 of all electricity production capacities belong to the thermal power plants. The share of thermal power plants in the electrical energy generation reaches 70% in Serbia. The thermal power engineering is also important for industrial and communal energy supply. Combined production of electrical energy and heat in thermal power plants is the most energy efficient and environmentally friendly solution for district heating in urban areas or for steam supply in industry. In transport sector, thermal turbomachines are applied as a prime mover for airplanes, ships, heavy vehicles, while turbochargers enhance performance of passenger and transport vehicles.

The Department is committed to the excellence in education and research. The Department offers a variety of obligatory and elective subjects on fundamental and specialized knowledge in fields of thermal power engineering. Many graduated students from this Department have become leading experts in national and international companies.

The research and development at the Department is performed in a firm connection and as a strong support to the current needs of national and international electric power utilities and energy power industry. Also, the research in various fields of the engineering science are conducted

with the application in the thermal power engineering. The engineering and scientific activities of the Department include:

- Nominal and partial load operation of steam and gas power plants,
- Energy and exergy analyses and optimization of thermal power plants,
- Development of systems for analyses, diagnostic and optimization of thermal power plants operation,
- Combined heat and power production,
- Combined gas and steam power plants, the total energy systems with heat pumps, etc.
- Energy efficiency, energy planning and policy,
- Transients in thermal and nuclear power plants,
- Transport phenomena in two-phase flow,
- Design of the thermal turbomachinery and thermal equipment,
- Thermal cycles calculation and optimisation,
- Stress analyses and vibrations in steam turbines,
- Revitalization of the thermal power plants,
- Thermal tests of steam turbines, subsystems or the whole thermal power plants,
- Expert investigations and analyses of incidents in the thermal power plants,
- Environmental protection and engineering related to design of systems and equipment for environment protection.

STAFF 3 professors, 5 teaching and research assistants

DATE FOUNDED 1959

DISTINGUISHED ALUMNI

- Prof. Georgije Pio-Uljski
- Prof. Mladen Popović
- Prof. Dragutin Stojanović
- Prof. Vojislav Djurić
- Prof. Dimitrije Savić
- Prof. Milorad Ristić

COOPERATION WITH FOREIGN UNIVERSITIES

- Universität Zürich, Switzerland
- Leibniz Universität Hannover, Germany
- University of Cambridge, United Kingdom
- University of Pennsylvania, Philadelphia, University of Texas, Austin, Florida International University, USA

COOPERATION WITH INDUSTRY

- Electric Power Industry of Serbia, Belgrade
- Thermal Power Plants "Nikola Tesla", Obrenovac
- "Panonske elektrane", Novi Sad
- Siemens, Erlangen, Germany
- MAN Turbo, Oberhausen, Germany
- General Electric, Cinsinati, USA
- Alstom, Switzerland/Germany



Full Professors:

Dr. Branislav Savić, Dr. Vladimir Stevanović, Dr. Milan Petrović.

Teaching and Research Assistants:

Mgr. Blaženka Maslovarić, Mgr. Sanja Prica, Dipl. Ing. Milan Banjac, Dipl. Ing. Miloš Despić, Dipl. Ing. Dejan Djukanović.

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Process and Environmental Protection Engineering

Department of Process Engineering (DPE) was established in 1966. Department of Process Engineering (DPE) is dedicated to teaching and researching in the field of process and environmental technology.

Besides the teaching activities staff of DPE was very active in research and development projects concerning process design, unit operations and equipment design, energy production and management, environmental protection, etc.

STAFF 8 professors, 2 teaching and research assistant, 2 associates

DATE FOUNDED 1966

DISTINGUISHED ALUMNI

- Prof. Dragutin Popović, Founder and famous lecturer
- Prof. Branislav Djaković
- Prof. Milan Antić

COOPERATION WITH FOREIGN UNIVERSITIES

- Norwegian University of Science and Technology, Trondheim, Norway
- University of Maribor, Faculty of Mechanical Engineering, Slovenia
- University of Skopje, FYROM
- University of Ljubljana, Slovenia
- "Politehnica" of Timisoara, Faculty of Mechanical Engineering, Romania

• ATZEVUS, Germany

COOPERATION WITH INDUSTRY

- Petroleum Industry of Serbia
- Public Enterprise "Electric power industry of Serbia"
- Public Utility Company Beogradske Elektrane
- Public Utility Company Belgrade Waterworks and Sewage

DPE realized a great number of projects for more than 300 Serbian and foreign companies concerning various tasks of process engineering, energy and environmental protection. Research projects, funded by Republic Ministry of Science, were also realized in cooperation with other research companies.

The important activity of the DPE is industrial and laboratory testing and pollutant emission measurement from stationary sources. This has been performed in power plants, cement factories, metallurgy, ceramic industry, foundries, oil refinery, food, drinks and water industry, etc. in Serbia and abroad.

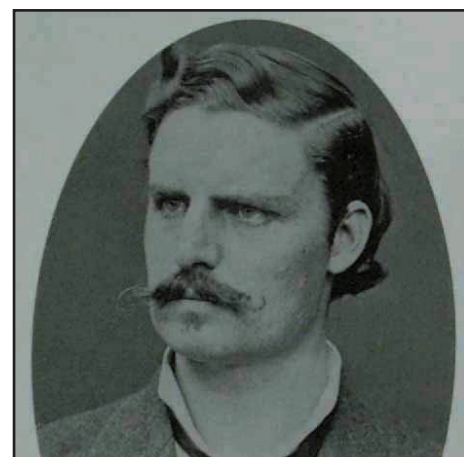
DPE also covers the application of computers in industry, software and hardware design for industrial measurements, process control, introduction of expert systems for process and plant control.

Experimental apparatus (heat exchanger, pilot rotary furnace, hot wire reactor, fix bed gasifier, pilot particle precipitation facility, small fluidized bed, venturi scrubber) is used in laboratories of DPE for research work.

In past forty years over 1100 students got their engineering graduate degree in process engineering (equivalent to MSc - 5 year degree) and over 120 students got engineering first level degree (equivalent to BSc - 3 year degree).

Over 70 students have completed former postgraduate courses in process engineering obtaining magister degree (Mgr. - 2 year postgraduate degree) and over 30 achieved doctoral degree (equivalent to PhD degree).

"A vital phenomenon can only be regarded as explained if it has been proven that it appears as the result of the material components of living organisms interacting according to the laws which those same components follow in their interactions outside of living systems."



Adolf Eugen Fick (1829-1901)

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pt.mas.bg.ac.yu

Full Professors:

Dr. Branislav Jaćimović, Dr. Martin Bogner, Dr. Goran Jankes, Dr. Miroslav Stanojević.

Associate Professors:

Dr. Aleksandar Petrović, Dr. Srbslav Genić, Dr. Aleksandar Jovović.

Assistant Professor (Dozent):

Dr. Dejan Radić.

Teaching and Research Assistants:

Mgr. Milenko Karan, Mgr. Mirjana Stamenić.



Thermomechanics

The Department of Thermomechanics (TMD) is dedicated to teaching and researching in the scientific field of Thermodynamics (TD), Heat & Mass Transfer (H&MT) and closely related scientific/engineering disciplines that all form theoretical basis for solving practical engineering problems in e.g. thermal & process engineering, then power production etc. It is theoretical basis for several courses into the programme of several moduli in the plan of newly conducted studies in accord with Bologna declaration.

STAFF 4 professors, 2 teaching and research assistants

DATE FOUNDED 1896

DISTINGUISHED ALUMNI

- Prof. Stevan K. Marković, First lecturer and founder of department
 - Prof. Aleksandar A. Brandt
 - Prof. Georgije N. Pio-Uljski
- Lecturers and authors of 1st and 2nd course textbook in serbian

- Prof. Fran S. Bošnjaković, World famous lecturer and scientist

COOPERATION WITH FOREIGN UNIVERSITIES

- Kyoto University, Kyoto, Japan
- Rheinisch-Westphalisch Technische Hochschule, Aachen, Germany
- Univerza v Mariboru, Maribor, Slovenija
- University of Vienna, Vienna, Austria
- Technische Hochschule, Karlsruhe, Germany

COOPERATION WITH INDUSTRY

- Thermal engineering lab., at VINČA Institute of nuclear sciences, Belgrade
- EPS (Electric Power Production Co. of Serbia), Headquarters, Belgrade

Our main task is to provide undergraduate and graduate students with theoretical & practical knowledge in: Thermodynamics B, Applied thermodynamics, Fundamentals of heat transfer, Thermodynamics M, Transport phenomena (TPH), Heat and substance transfer, TD of chemical processes, Advanced course TPH + analogies, Statistical thermodynamics, TD of irreversible processes, TD of multicomponent systems, Entropy-exergy analysis of the process and equipment efficiency, Lab/in-situ measurements in TM, Advanced course in heat transfer, Numerical methods in TM

TMD Experimental facility includes:

1. model room for testing efficiency of switching from classical heating to the low temperature panel heating,
2. experimental duct closed loop with a fan for testing heat exchangers, cooling towers refill and drying,
3. thermovision camera for detecting insulation & wall failure / heat bridge by visualizing temperature fields.

Along with teaching, faculty/staff of TMD have been, actively, conducting research projects funded by Ministry of science and/or by EPS and other industry subjects. Recently, research areas include highly actual problems of Energy Efficiency enhancement as well as Use of Sustainable Energies of Sun, Ground and Subsoil water. Currently a EUREKA project on use of geothermal water heat via cascade heat pump is active bilateral cowork with Slovenian team. Other projects cover co-combustion + co-gasific'n of coal w. biomass and waste. Also, numerical simulation of various heat and mass transfer cases is commonly performed whenever needed.

“The production of motive power is then due in steam engines not to actual consumption of the caloric but to its transportation from a warm body to a cold body.”



Nicolas Léonard Sadi Carnot (1796-1832)
in the dress uniform of a student of the
École Polytechnique.

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Full Professor:

Dr. Mirko Komatina.

Associate Professors:

Dr. Bogosav Vasiljević, Prof. Dr. Aleksandar Saljnikov

Assistant Professor (Dozent):

Dr. Miloš Banjac.

Teaching and Research assistants:

Mgr. Milan Gojak, Mgr. Ružica Todorović.





Hydropower Engineering

Hydropower Engineering Department has a great tradition, since it is one of the oldest at the Faculty, established in 1932. Contemporary department's name is the Department for Hydraulic Machinery and Energy Systems. The Department's main goals, besides education, are engagement with the theoretical and experimental research and industry cooperation. The researchers cultivate all forms of theoretical, numerical and experimental works in the field of fundamental, development and applicable hydraulic research. The main basis for experimental research is the Department's laboratory, the biggest one at the Faculty, which consists of several divisions: Laboratory for model pumps research, Laboratory for model turbine and hydraulic coupling research, Laboratory for gas equipment, Laboratory for compressors and fans, Laboratory for fluid measurements and Laboratory for hydro mechanical equipment. Laboratories are equipped with corresponding and modern measuring devices. The most significant experimental installations are: installation for determination of energy and

cavitation characteristics of pump models, installation for testing turbines, pumps and fans with air, installation for investigation of model pumps, flow meters, gates and valves, installation for determination of energy characteristics of radial and axial fans, installation for probes calibration, installation for swirling flow research.

Some of the most important fundamental research results are: swirl flow phenomena in straight pipes and diffusers, flow stability related to flow geometry, energy losses in turbomachinery impellers, unsteady flow in complex hydraulic systems, turbulent models, improved method for measuring velocity and pressure flow field with Conrad probe, etc.

Some of the most important recent results for industry: development and design of bulb turbines for national industry, development of flow geometry in small hydro power plants, development of software for calculation and design of radial and axial hydraulic turbomachinery, development of software for calculation of waterhammer and reverse waterhammer in systems with double regulated hydraulic turbines, development of software for calculation of hydraulic oscillations and system stability analysis, etc.

The Department for Hydraulic Machinery and Energy Systems has a good cooperation with industry: Electric power industry of Serbia (EPS-Elektroprivreda Srbije), Serbian Oil Industry (NIS-Naftna Industrija Srbije), Serbian Army Forces, Waterworks and Sewage Systems, Petrochemical Industry, Goša-FOM, Corporation Ivo Lola Ribar, Janko Lisjak, Power machines (Силовые машины) St. Petersburg, VATECH-Zürich, Minel Kotlogradnja, Holding RTB-FOD, etc.

Relations with the other International Universities: Technische Fakultät Friedrich Alexander - Universität Erlangen - Nürnberg, Germany; University of Resita, Engineering Faculty, Romania; Technical University, Timisoara, Romania, Institut für Strömungslehre und Strömungsmaschinen, Universität Karlsruhe, Germany; D'Ecole Nationale Supérieure d'Electricité et de Mécanique, (EN-SEM), Nancy, France; Tohoku University, Japan; Госстрой России, Сантехниипроект. институт Москва, Россия; Technische Universität (TU) Carolo-Wilhelmina zu Braunschweig, Germany; Faculty of Mechanical Engineering, University of Illinois, USA; EPFL-LMH, Lausanne, Suisse; LMZ, Petersburg, Russia; ASTRÖ, Graz, Austria.

The Department has a long tradition and is unique in this field in Serbia, has good programmes for the subjects at all levels of studies, constantly innovated, and possesses necessary laboratories for scientific and research work, has good partnership with energy systems, industry, faculties and institutes, has significant number of scientific results, has significant number of technical solutions.

STAFF 3 professors, 4 teaching and research assistants, 2 associates

DATE FOUNDED 1948

DISTINGUISHED ALUMNI

- Prof. Svetozar Zorić, First lecturer
- Prof. Vladimir Farmakovski, member of Serbian Academy of Sciences and Arts, Famous lecturer and innovator
- Prof. Nikola Obradović, member of Serbian Academy of Sciences and Arts, Innovator

COOPERATION WITH FOREIGN UNIVERSITIES AND COOPERATION WITH INDUSTRY

- In the text

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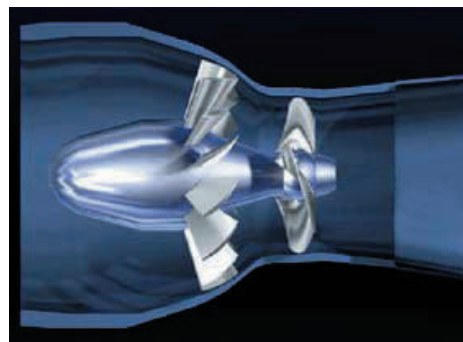
Web site: www.mas.bg.ac.yu/obrazovanje/odseci/he/odseci-he.html

Full Professors:

Dr. Miroslav Benišek, Dr. Aleksandar Gajić, Dr. Miloš Nedeljković.

Teaching and Research Assistants:

Dipl. Ing. Đordje Čantrak, Dipl. Ing. Bojan Ivljanin, Dipl. Ing. Ivan Božić, Dipl. Ing. Dejan Ilić.



Mathematics

Mathematics is the body of knowledge centered on concepts such as quantity, structure, space, and change, and also the academic discipline that studies them. Other practitioners of mathematics maintain that mathematics is the science of pattern, and that mathematicians seek out patterns whether found in numbers, space, science, computers, imaginary abstractions, or elsewhere. Mathematicians explore such concepts, aiming to formulate new conjectures and establish their truth by rigorous deduction from appropriately chosen axioms and definitions.

Through the use of abstraction and logical reasoning, mathematics evolved from counting, calculation, measurement, to the systematic study of shapes and motions of physical objects. Knowledge and use of basic mathematics have always been an inherent and integral part of individual and group life. Refinements of the basic ideas are

visible in mathematical texts originating in the ancient Egyptian, Mesopotamian, Indian, Chinese, Greek and Islamic worlds. Rigorous arguments first appeared in Greek mathematics, most notably in Euclid's Elements. The development continued in fitful bursts until the Renaissance period of the 16th century, when mathematical innovations interacted with new scientific discoveries, leading to an acceleration in research that continues to the present day. Today, mathematics is used throughout the world in many fields, including natural science, engineering, medicine, and social sciences, such as economics. Applied mathematics, the application of mathematics to such fields, inspires and makes use of new mathematical discoveries and sometimes leads to the development of entirely new disciplines. Mathematicians also engage in pure mathematics, or mathematics for its own sake, without having any application in mind, although applications for what began as pure mathematics are often discovered later.

The Department of Mathematics offers undergraduate, graduate and postgraduate educational programmes in mathematics and computer science.

The main research areas of our Department are: Nonlinear functional analysis, Banach and Hilbert spaces, Numerical integration, Information systems and Relational database systems.

Staff: 5 professors, 6 teaching and research assistants.

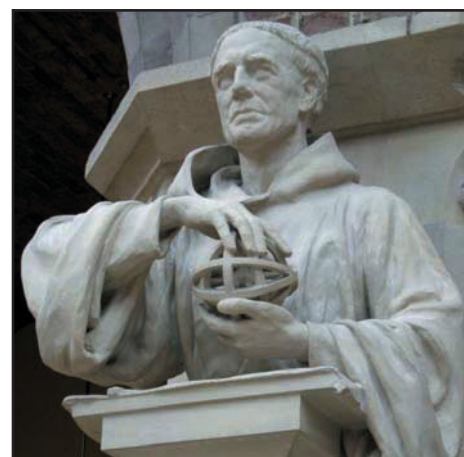
COOPERATION WITH FOREIGN INSTITUTIONS

- Gunma University, Japan
- Changwon National University, Seoul, South Korea
- Norwegian University of Science and Technology, Trondheim, Norway
- Steinbeis Transfer Center South-Eastern Europe, Germany
- Steinbeis Transfer Center Advanced Risk Technologies - Eastern Europe, Germany

COOPERATION WITH INDUSTRY

- Spinnaker New Technologies, Belgrade, Serbia
- IPON sistem, Belgrade, Serbia
- Jugodisk ad, Belgrade, Serbia
- ATM, Belgrade, Serbia

“Neglect of mathematics works injury to all knowledge, since he who is ignorant of it cannot know the other sciences or the things of the world.”



Roger Bacon (1214-1294)

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Full Professors:

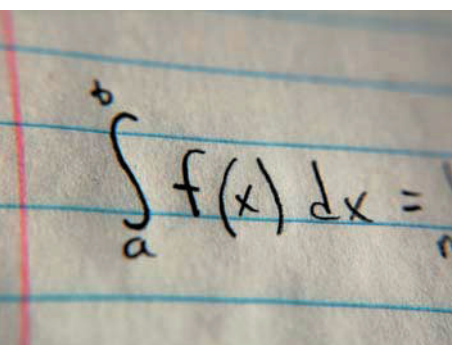
Dr. Dušan Georgijević, Dr. Stojan Radenović, Dr. Miodrag Spalević.

Assistant Professors:

Dr. Ivan Arandelović, Dr. Stojan Radojević.

Teaching and Research Assistants:

Mgr. Goran Lazović, Mgr. Marina Milovanović-Arandelović, Mgr. Dragan Doder, Dipl. Math. Andrija Jandrić, Dipl. Math. Davorka Jandrić, Dipl. Math. Slaviša Pantelić.



Control Engineering

Members of the Department of Automatic Control achieved rich and diversified fundamental, development and applied research in almost all fields of automatic control, and obtained very significant results. Some of these researches were financed by the state, and some were financed through direct cooperation with companies in the country. Two basic directions of these researches are:

- Developing new concepts and control algorithms for securing better system characteristics and realizing and implementing new knowledge in automatic control in specific plants.
- Observation theory: (continual systems, Lurie's problem, observation domains, Laypunov observation, singular disturbed systems).
- Mathematical modelling of regulation mechanisms in biological systems.

• Operation of biomedical devices and apparatuses.

Due to their exceptional characteristics nowadays, predominant role in automatic control have controlling systems realized through computer systems. They are easily accessible because of their affordable price. Systems of automatic control with special significance are those based on classical logic rules, fuzzy logic rules, neural networks, genetic algorithms etc. The Department of Automatic Control provided very important results in terms of developing new non-conventional controlling algorithms, which guarantee significant improvement of systems' behavior and characteristics compared to classic algorithm utilization. These algorithms are used in realization of:

- Accompanying controlling systems in electrical-hydraulic and electrical-pneumatic systems
 - Widely modulated temperature controlling systems
 - Plastic nozzle compress controlling systems
 - Control systems for devices and apparatuses in biomedicine etc.
 - Control systems for nanotechnology devices.
- Our department runs to study modules:
- Control engineering
 - Biomedical engineering

STAFF 5 professors, 3 teaching and research assistants, 1 associates

DATE FOUNDED 1970

DISTINGUISHED ALUMNI

- Prof. Borislav Milojković, First lecturer
- Prof. Ljubomir Grujić, Long term Head of the department
- Prof. Milivoje Sekulić, Innovations in Exploitation of Circuits

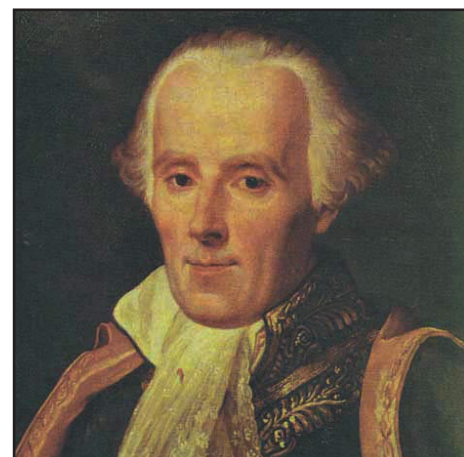
COOPERATION WITH FOREIGN UNIVERSITIES

- University of Hong Kong, Hong Kong
- Wuppertal University, Germany
- University of Exeter, Devon, United Kingdom
- University of Wisconsin, Madison, Rutgers University, New Brunswick, USA

COOPERATION WITH INDUSTRY

- Gumaplast, Indija
- Soko Štark, Belgrade
- Krušik Plastika, Osečina

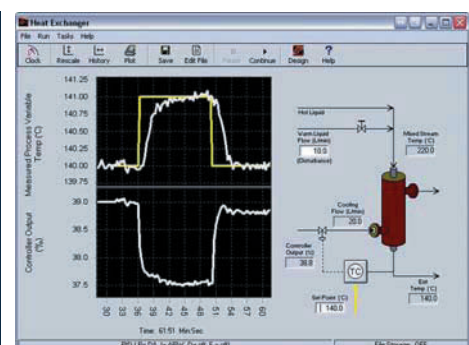
"All the effects of Nature are only the mathematical consequences of a small number of immutable laws."



Pierre-Simon, marquis de Laplace
(1749 - 1827)

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Full Professors:
Dr. Zoran Bučevac, Dr. Dragutin Debeljković, Dr. Đuro Koruga, Dr. Zoran Ribar.
Associate Professor:
Prof. Dr. Dragan Lazić.
Teaching and Research Assistants:
Mgr. Radiša Jovanović, Mgr. Srđan Ribar, Mgr. Milan Ristanović.





Physics and Electrical Engineering

The Department of Physics and Electrical Engineering for many years successfully carries educational and research activity at the Faculty of Mechanical Engineering.

Joint research activities with various institutions are focused on:

- interaction of electromagnetic waves with broadly changeable environment (for example, dielectric properties of substance);
- physics of ionized gases;
- low temperature plasma; Momentum transfer theory; negative differential conductivity;

STAFF 7 professors, 3 teaching and research assistants

DATE FOUNDED 1948

DISTINGUISHED ALUMNI

- Prof. Dragoljub Milosavljević
- Academician Petar Miljanić, Long term Head of the department

COOPERATION WITH FOREIGN UNIVERSITIES

- Moscow State University MGU, Russia
- Rutgers University, New Brunswick, University of California, Berkley, University of Wisconsin, Madison, USA

COOPERATION WITH INDUSTRY

- Institute "Vinca", Military Technical Institute, Institute of Physics, Faculty of Physics, Faculty of Electrical Engineering, Institute for Multidisciplinary Research, Institute of Technical Sciences of the Serbian Academy of Sciences and Arts ; Belgrade
- Hemofarm, Vršac;
- Hydropower plant Vrla-1;
- Krusik, Valjevo

- laser application in metrology and particle measurements; laser and phase Doppler anemometry;

- photo-voltage conversion of sun light and solar panels and modules;

- photo-sensors of non-ionized radiation;

- development of advanced functional materials.

For the research and development of advanced electroceramic materials based on barium titanate, the work team has been awarded a gold medal in 2000 and a special plaque with gold medal in 2002, from the Belgrade Association of Inventors.

Other activities:

- R&D in Circuits and Systems
- Research in Microelectronics
- Applied Mathematics

"Ere many generations pass, our machinery will be driven by a power obtainable at any point of the universe. Throughout space there is energy. Is this energy static or kinetic! If static our hopes are in vain; if kinetic — and this we know it is, for certain — then it is a mere question of time when men will succeed in attaching their machinery to the very wheelwork of nature."



Nikola Tesla (1856-1943)

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Full Professors:

Dr. Dragan Kandić.

Associate Professors:

Dr. Jelena Ilić, Dr. Jasmina Jovanović, Dr. Zoran Trifković, Dr. Dobrila Škatarić, Dr. Aleksandra Vasić-Milovanović.

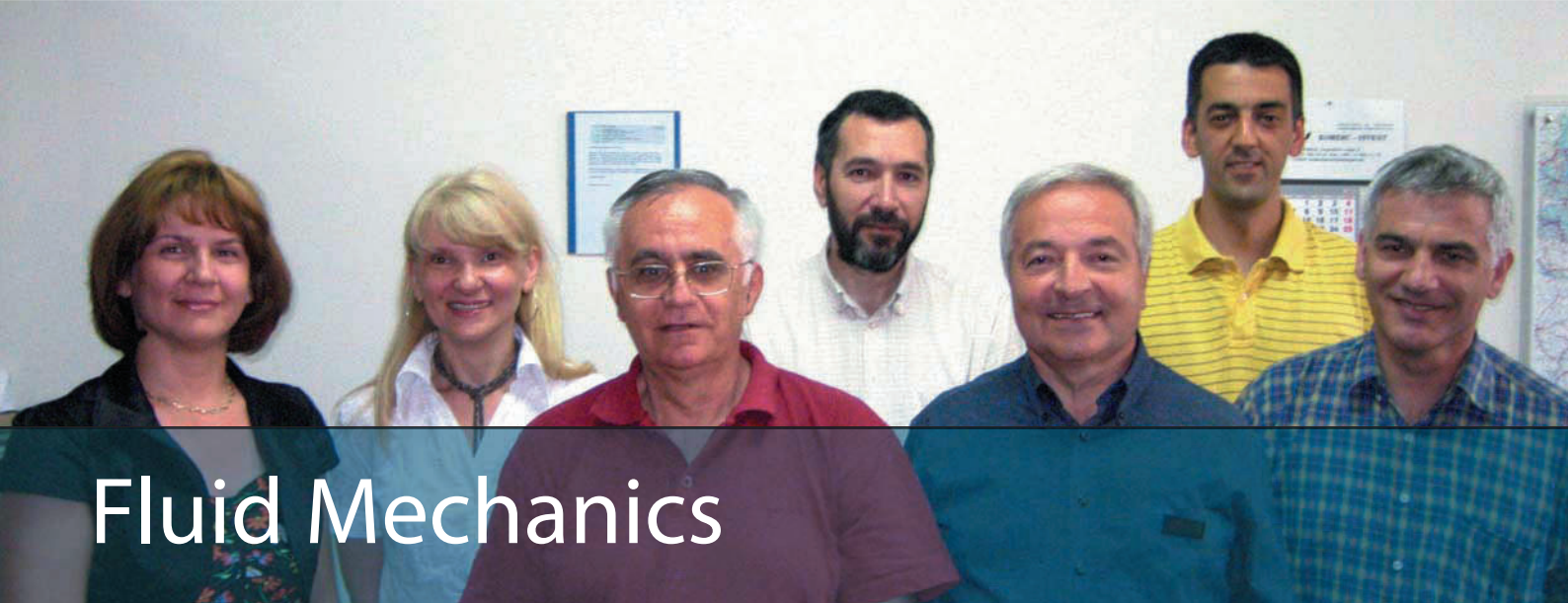
Assistant Professors (Dozents):

Dr. Petar Lukić.

Teaching and Research Assistants:

Mgr. Vera Pavlović, Mgr. Nada Ratković-Kovačević, Dr. Tomislav Stojić.





Fluid Mechanics

The Department of Fluid Mechanics has significant contribution in development of science and education in the field of theoretical and applied Fluid mechanics in Serbia and former Yugoslavia.

The Department is in charge of BSc, MSc and PhD courses at the Faculty of Mechanical Engineering in Belgrade. It covers wide domain of research activities in theoretical, experimental and computational Fluid mechanics, such as:

- Problems in hydrodynamic stability.
- Laminar and turbulent boundary layer flow.
- Internal and external flow of compressible fluids.

STAFF 5 professors, 2 teaching and research assistants

DATE FOUNDED 1961

DISTINGUISHED ALUMNI

- Prof. Konstantin Voronjec, member of Serbian Academy of Sciences and Arts
- Prof. Viktor Saljnikov
- Prof. Mane Šašić
- Prof. Vladan D. Djordjević, member of Serbian Academy of Sciences and Arts
- Prof. Radomir Ašković, University of Vallenciennes, France

COOPERATION WITH FOREIGN UNIVERSITIES

- University of Southern California, Los Angeles, USA
- University of Algiers, Algier
- University of Karslue, Karslue, University of Freiburg, Freiburg, Germany
- University of Poitiers, ENSMA, France
- University of Vallenciennes, France

COOPERATION WITH INDUSTRY

- Etamic, Paris, France
- SILEC, Paris, France

- Convective flow.
- Wave motion in fluids.
- Turbulent swirling flow in pipes and diffusers.
- Magneto-hydrodynamic and magneto-gas-dynamic flows.
- Multiphase flow and cavitations problems.
- MEMS flow.

The scientific work on the Department is recognized by numerous papers published in leading international scientific journals in the field of Fluid mechanics, such as J. of Fluid Mechanics, Physics of Fluids, AIAA J., ASME J. of Fluid engineering, Izvestiya AN SSSR Meh. zhidkosti i gasa, Acta Mechanica, ZAMM, C.R. de l'Academie des Sciences, Paris, and many others.

The Department has two research and teaching laboratories: for fluid mechanics and for hydraulics and pneumatics. Laboratories are humbly equipped, by they have some modern pieces of experimental equipment, such as Particle Image Velocimetry (3-D) system, Hot-wire Anemometry, Primary flow calibrator, etc, and number of experimental rigs for students' laboratory work, as well as for experimental research.

“There is no philosophy which is not founded upon knowledge of the phenomena, but to get any profit from this knowledge it is absolutely necessary to be a mathematician.”



Daniel Bernoulli (1700-1782)

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acocic@mas.bg.ac.yu

Web site: www.mas.bg.ac.yu/obrazovanje/katedre/mehanika-fluida/flu-nas-pr.html

Full Professors:

Dr. Miloš Pavlović, Dr. Svetislav Čantrak, Dr. Cvetko Crnojević.

Assistant Professors (Dozents):

Dr. Milan Lečić, Dr. Nevena Stevanović.

Teaching and Research Assistants:

Mgr. Snežana Milićev, Mgr. Aleksandar Čočić.





Aerospace Engineering

HISTORY & TRADITION

The Department of Aerospace Engineering is truly regional multidisciplinary center of aeronautical engineering with teaching, research & development activities focused on flight vehicles problems concerning methods and means of design, manufacturing and maintenance.

Since 1921, the Department of Aerospace Engineering is dedicated to development of aerospace engineering and overcoming contemporary problems and demands of aircraft industry. The goals to approach future challenges with even greater commitment of the staff and to make significant contribution to the developing of aerospace industry will be achieved, as since the early days of aerospace engineering, using

STAFF 13 professors, 4 teaching and research assistants, 2 associates

DATE FOUNDED 1921

DISTINGUISHED ALUMNI

- Prof. Miroslav Nenadović, member of Serbian Academy of Sciences and Arts
- Prof. Dušan Stankov, CTO Aeroplane factory Zmaj, Zemun
- Prof. Sima Milutinović, CTO First Serbian Aeroplane factory Rogožarski, Belgrade

COOPERATION WITH FOREIGN UNIVERSITIES

- University Al-Fatah, Lybia
- University of Illinois, Urbana Champaign, USA
- Technical University, Prague, Czech Republic

COOPERATION WITH INDUSTRY

- JAT Airways, Belgrade
- Boeing, Seattle, USA
- VTI Žarkovo, Belgrade
- VZ Moma Stanojlović, Belgrade

innovative solution and with full dedication of the staff.

EDUCATION

Constant care of the Chair for Aeronautics is to develop & improve the teaching process and to maintain it at the level of instruction at the leading world universities and to meet new aerospace engineering demands and challenges. The complexity of modern aircraft, the degree of the development of the aeronautical technology, and continuous endeavors of the present Chair towards improvements in order to make the instruction as efficient as possible, led to changes in syllabuses, and especially in teaching programs.

We consider our students as our present and future partners and associates.

LABORATORIES

The Department encompasses all necessary laboratories and equipment for providing experiments for teaching and research & development purposes.

Our research facilities include:

- Laboratory for structural analysis
- Laboratory for jet propulsion
- Laboratory for subsonic flow
- Laboratory for supersonic flow
- Laboratory for avionics
- Laboratory for computer simulation
- Laboratory for micropropulsion

RESEARCH & DEVELOPMENT

Research and development activities are focused on advanced fields of aeronautics:

- Aerodynamics
- Design & Structural analysis

- Avionics
- Propulsion
- Wind turbines

The research and development achievements incorporating innovation approaches resulted in realized projects and products and successful cooperation with numerous industrial partners.

PROJECTS (FROM THE REFERENCE LIST)

List of some of the completed projects and part of the reference list:

- GALEB (Sea Gull)
- JASTREB (Hawk)
- ORAO (Eagle)
- SUPER GALEB (Super Sea Gull)
- KRAGUJ (Vulture)
- LASTA (Swallow)
- UTVA 75
- Moma 86
- Mi-8 Main Composite Rotor Blade
- Gazelle Main Composite Rotor Blade
- Trisonic wind tunnel T-38
- Hypersonic wind tunnel VTI
- Composite Vuk-T Sailplane
- Very light rotorcraft H135
- Wind turbine SAZ-15

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Web site: www.mas.bg.ac.yu/obrazovanje/odseci/va/odseci-va.html



Full Professors:

Dr. Branislav Jojić, Dr. Zoran Stefanović, Dr. Zlatko Petrović, Dr. Slavko Pešić, Dr. Boško Rašuo, Dr. Jovan Janković, Dr. Slobodan Stupar.

Associate Professor:

Dr. Zoran Bojanić.

Assistant Professors (Dozents):

Dr. Vasko Fotev, Dr. Ivan Kostić, Dr. Časlav Mitrović, Dr. Nebojša Petrović, Dr. Aleksandar Bengin.

Teaching and Research Assistants:

Mgr. Aleksandar Pantović, Mgr. Aleksandar Grbović, Mgr. Mirko Dinulović, Mgr. Danilo Petrašinović, Dr. Nikola Davidović, Dr. Predrag Miloš, Mgr. Dragan Komarov, Dipl. Ing. Ognjen Peković, Dipl. Ing. Marija Stanojević, Dipl. Ing. Srdjan Trivković.



Weapon Systems

The Department of Weapon Systems is unique in this part of the world and it provides a rich environment for undergraduate and graduate studies, supported by stimulating education and research projects applied to military technology.

STAFF 4 professors, 2 teaching and research assistants, 1 associate

DATE FOUNDED 1948

DISTINGUISHED ALUMNI

- Prof. Boško Stanisavljević, Famous lecturer and innovator
- Prof. Obrad Vučurović, Famous lecturer and innovator
- Prof. Milorad Dragojević, Famous lecturer and innovator
- Prof. Aleksandar Stamatović, Innovations in Weapons
- Anastas Paligorić, Dipl. Ing., Famous innovator

COOPERATION WITH FOREIGN UNIVERSITIES

- Imperial College, London, United Kingdom
- Beijing Institute of Technology, Beijing, China
- Purdue University, West Lafayette, USA
- ENSTA, Paris, France
- Cranfield University, United Kingdom
- Moscow State University Bauman, Moscow, Russia

COOPERATION WITH INDUSTRY

- Sloboda, Čačak
- Prvi partizan, Užice
- Krušik, Valjevo
- Zastava Arms, Kragujevac
- Prva iskra, Barič
- Milan Blagojević, Lučani
- IMTEL, Belgrade
- Jugoimport SDPR, Belgrade

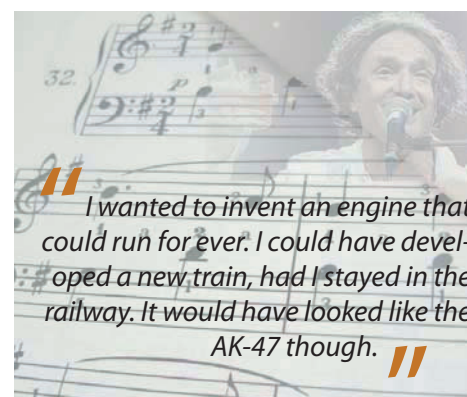
For educational and scientific research purposes, the Department founded the Centre for Weapon Systems comprising the lab with ballistic tunnel 50 m long.

The Department and its associates are engaged in numerous projects dealing with current issues in areas of weapons and defense equipment design.

Particular emphasis is placed on projects with multi-disciplinary approaches, armaments modernization programs and on development of dual-purpose technologies.

The main research fields of the Department members:

- Interior ballistics
- Rocket propulsion
- Combustion
- Physics of explosion
- Aerodynamics
- Flight dynamics
- Projectiles and warheads design
- Artillery systems design
- Launchers
- Fire control systems
- Rocket design
- Rocket system integration
- Guidance and control of projectiles
- Weapon efficiency
- Ballistic protection
- Measurement and testing of weapon systems
- Standardization of explosive materials storage and maintenance
- Special weapons and protection, etc.



"I wanted to invent an engine that could run for ever. I could have developed a new train, had I stayed in the railway. It would have looked like the AK-47 though."



Mikhail Kalashnikov (1919 -)

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Full Professors:
Dr. Slobodan Jaramaz, Dr. Đorđe Blagojević, Dr. Momčilo Milinović.
Associate Professor:
Dr. Dejan Micković.
Teaching and Research Assistant:
Mgr. Predrag Elek.
Associate:
Dr. Marko Miloš.





Naval Architecture

HISTORY AND TRADITION

The Department of Naval Architecture was founded in 1948 and is today the only such department in Serbia and Montenegro. The founder of the Department was Academic Jakov Hlitičijev. He was followed by a number of distinguished

STAFF 3 professors, 3 teaching and research assistants, 2 associates

DATE FOUNDED 1948

DISTINGUISHED ALUMNI

- Academic Jakov Hlitičijev, First Head and founder of the Department

DISTINGUISHED PROFESSORS

- Prof. Stevan Stevović, Founder of the Department
- Prof. Nenad Zrnčić, member of Serbian Academy of Science and Arts
- Prof. Borivoje Ribar
- Prof. Borislav Džodžo
- Prof. Branislav Bilan

COOPERATION WITH FOREIGN UNIVERSITIES

- University of Southampton, United Kingdom
- University of Duisburg-Essen, Germany
- Delft University of Technology, The Netherlands
- Technical University of Athens, Greece
- Technical University, Denmark

COOPERATION WITH INDUSTRY

- Development Centre for Ship Technology and Transport Systems (DST), Duisburg, Germany
- Via Donau, Vienna, Austria
- Shipyards belonging to the association Dunav brod
- Jugoregistar (Serbian register of shipping)
- Yugoslav River Shipping Company (JRB)
- Intermost (member of Vinci group)

professors and experts in different fields of naval architecture.

During the last sixty years, the growth of Serbian shipbuilding industry was enormous, resulting in completion of more than 2300 seagoing ships and inland vessels that today operate worldwide. This would not be possible without more than 400 naval architects who graduated from the Department of Naval Architecture in Belgrade. In addition, numerous naval architects educated at our Department, work at foreign universities, research facilities, institutes and shipyards. Some of them have successfully continued their postgraduate and doctoral studies in the Netherlands, Great Britain, Italy, Denmark, Canada, USA and other countries.

UNDERGRADUATE AND POSTGRADUATE STUDIES

Naval architecture is a profession based on the centuries of experience in shipbuilding. Therefore, our Department aims to offer an educational approach based on balanced combination of traditional craftsmanship and application of the modern engineering methods and advanced software. Students are taught to design ship lines plans, to perform calculations of ship structure, ship resistance and propulsion, and to solve various problems of ship stability, ship strength, seakeeping, maneuvering, etc. Knowledge obtained through undergraduate courses enables naval architects to design both seagoing and inland vessels. Postgraduate courses make naval architects capable of working in research facilities and various institutes.

LABORATORY EQUIPMENT

The Department possesses equipment/instruments for measurement of various kinds of ship

vibrations, for instance, ship structure vibrations, engine and equipment vibrations, torsion vibrations of shaft lines, power absorption, noise etc. Amongst measurements performed on vessels on the Danube and Sava, this equipment was also used for diverse measurements done on patrol vessels on the Irawadi River in Burma.

RESEARCH AREAS AND REFERENCE PROJECTS

- Development of risk-based ship stability regulations (for which members of Department were awarded with RINA-Lloyd Register Ship Safety Award)
- Seakeeping and dynamic stability of ships
- Mathematical models for evaluation of resistance and propulsion characteristics of high speed craft
- Numerical methods in ship structural design
- Development in classification of ship hull structures
- Wave induced loads on ships
- Design of shallow draught and inland vessels in general
- Measurement and analysis of vibrations, noise and power absorption
- Feasibility studies regarding inland waterway transport.

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Full Professors:

Dr. Milan Hofman, Dr. Dejan Radojčić, Dr. Milorad Motok.

Teaching and Research Assistants:

Mgr. Aleksandar Simić, Mgr. Igor Bačkalov, Mgr. Jasna Jovović.



Members of the Department of Naval Architecture receiving the Royal Institution of Naval Architects and Lloyd's Register Education Trust Ship Safety Award for 2007.



Internal Combustion Engines

HISTORY & TRADITION

The first lectures in Internal Combustion Engines at University of Belgrade, date back in 1919, just after the WW-I. It was only 22 years after Rudolf Diesel for the first time, managed to operate his engine successfully. Education and research have been enriched and supported widely with first dedicated lab facility built in early 1931.

Standing on its long history and tradition, the Internal Combustion Engines Department (ICED)

STAFF 2 professors, 3 teaching and reasearch assistants, 1 associate

DATE FOUNDED 1948 (lectures from 1897)

DISTINGUISHED ALUMNI

- Prof. Dr Rade Jankov, ICED, Famous lecturer and innovator
- Prof. Dr Radivoje Trifunović, ICED, Famous lecturer and innovator
- Prof. Dr Dušan Gruden, PORSCHE AG, Well known expert
- Prof. Dr Zoran Filipi, University of Michigan, Well known professor
- Prof. Slobodan Dobrosavljević, First head of ICED (1948)
- Prof. A.I. Kosicki, writer of the first textbook in Serbian for ICE (1935)

COOPERATION WITH FOREIGN UNIVERSITIES

- University of Michigan, Ann Arbor, USA
- University of Manchester, University of Loughborough, Imperial College, King's College, Queen Mary College, London, United Kingdom
- TH Aachen, TU Muenchen, TU Darmstadt, Germany
- TU Graz, Austria

focuses itself today on a well-founded teaching and innovative and recognized research for practical applications in the field of internal combustion engines and compressors.

EDUCATION

The field of ICE, continually grows and develops faster than ever in every aspect of engine design, its process understanding and control, efficiency, manufacturing and maintenance. Today, defining the main goals in education for an engine specialist presents extremely challenging, demanding and, most of all, responsible task.

Having in mind engine as a heat machine, we in ICED, believe in soundly founded theoretical and practical background in thermal and fluid sciences, as a base for further special training in ICE. Modern facilities, vivid presentations, individual approach to each student and problem-solution oriented lectures in extremely interesting topics in engine design, combustion control, mixture formation, mechatronics, and charging provides our students with in-detail up-to-date theoretical knowledge and understanding on the most fascinating and fastest dynamical object on Earth.

Laboratory facilities, one of the largest at the Faculty, designed, equipped and used regularly for research activities gives students unique and rear opportunity to learn, feel and experience in vivo many aspects of testing ICE and participate in our research projects.

Based on current requirements and global technical knowledge and achievements, lectures, both class and laboratory, are continually updated every year, and so, fitted to an engineer intending to work in the field of ICE. in the future.

LABORATORY

ICED encompasses eight engine test cells, single-cylinder research engine cell, fuel injection and mixture formation laboratory, ignition and electric gear laboratory, high capacity multi-purpose bench for valve/port flow measurements, piston compressor test facility and turbo-compressor test laboratory.

RESEARCH

- ICED focuses research mainly in the fields of:
- engine simulation techniques
- turbo charging
- measurement and mechatronic systems and techniques applied to engine control and diagnostics.

PROJECTS (FROM THE REFERENCE LIST)

- Development of Turbocharged SI engine (prototype).
- Development of Tank/Armored Vehicle CI Engine (boosting from 550 to 880 kW).
- Research & Development of High-pressure diesel injection system (prototype testing& production).
- Research & Development of the range of Turbochargers for CI engines.
- Research & Development of the range of Roots blowers (prototype testing).

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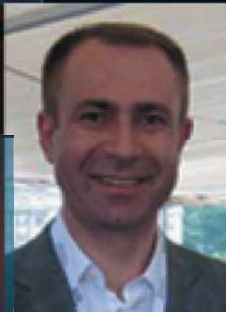
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Web site: www.mas.bg.ac.yu/obrazovanje/odseci/mo/odseci-mo.html
motori.mas.bg.ac.yu



Full Professor:
Dr. Miroljub Tomić.
Assistant Professor:
Dr. Miloš Cvetić.
Teaching and Research Assistants:
Mgr. Dragan Knežević, Mgr. Slobodan Popović, Mgr. Nenad Miljić.



Motor Vehicles

The development of advanced intelligent vehicles, their systems and components continues to offer exciting and challenging work for highly motivated and well educated young people.

Research, design and development in the area of automotive engineering has become a wideranging branch of engineering, encompassing electronics, computing, materials science and ergonomics, as well as the traditional core subjects of mechanical engineering science.

The objective of the Department is an advanced education of students able to create products of the future, which in the near and distant future, will meet and satisfy the needs of the user.

STAFF 6 professors, 3 teaching and research assistants, 3 research associates
DATE FOUNDED 1946
DISTINGUISHED ALUMNI

- Prof. Aleksej Lebedev, First MV lecturer
- Prof. Milan Cvetnić,
- Prof. Miroslav Nenadović
- Prof. Mihailo Borisavljević
- Prof. Jovan Todorovic, Long term Head of the Department

COOPERATION WITH FOREIGN UNIVERSITIES

- Università di Palermo, Italy
- Universities of Skopje, Banja Luka, Ljubljana, East Sarajevo

- RMIT, Melbourne, Australia
- NTU Athens, Greece

COOPERATION WITH INDUSTRY

- Toowoomba Foundry, Australia
- Mercedes Benz, Germany
- Zastava Cars, Zastava Trucks, Ikarbus, FAP, IMT, IMR, PPT and many more from Serbia and former Yugoslavia countries.

New technologies, such as integrated active and passive vehicle safety systems, application of new materials and electronic components in addition to new vehicle drives (electric, hybrid, etc.) impose challenging engineering problems for the future, requiring a broadly-based multidisciplinary education.

The Department of Motor Vehicles is concerned with all aspects of R&D of motor vehicles and their trailers both from education at BSc, MSc, and PhD levels point of view, as well as in offering R&D services to evaluate new technologies and to improve automotive product engineering processes. The Department provides services to the industry in form of R&D, certification and approval testing, application of CAD/CIMM/ICT technologies, mechanical design assessment and consultancy. Our curriculum is internationally recognized for continually educating the most qualified and well-rounded experts in the field of automotive engineering.

The Department has over 60 years of experience in teaching, advising and placing graduates in the automotive industry and related positions. So far 1.250 students have graduated from the Department of Motor Vehicles.

Students at our Department can follow the following courses: Fundamentals of Motor Vehicles, Vehicle Systems, Vehicle Dynamics, Vehicles Performance, Design of Vehicles 1, Quality of Service, Design of Vehicles, Skill Praxis 1, System Effectiveness, Vehicle Drive and Running Gears, Automotive Friction Systems, Vehicle Mechatronics, Vehicle Body, Vehicle Testing, Vehicle Maintenance, Systems Engineering, Forensic Engineering, Skill Praxis 2, etc.

Automotive employment opportunities exist in every country and in all parts of the world. The employment and career opportunities that our Department degrees offer are very wide and without limits.

Motor Vehicle Center is an organizational unit for science-research activities within the Department, comprised of the following units:

1. CIAH Laboratory
- FRIMEKS Laboratory for Automotive
2. Friction Mechanisms and Braking Systems
3. LAFI – Laboratory for Automotive Forensic Engineering
4. System Effectiveness Unit
5. Vehicle Body Structure Unit
6. Vehicle Design Unit
7. Vehicle Life Cycle Management Unit

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Full Professors:

Dr. Živan Arsenić, Dr. Čedomir Duboka, Dr. Gradimir Ivanović.

Associate Professors:

Dr. Branko Vasić, Dr. Branislav Rakićević.

Assistant Professor (Dozent):

Dr. Dragan Aleksendrić.

Teaching and Research Assistants:

Mgr. Ivan Blagojević, Mgr. Saša Mitić, Dr. Vladimir Popović.



Railway Mechanical Engineering

In research and teaching, the Railway Mechanical Engineering Department is mainly focused on rail vehicles. Its development is tightly connected with the development of domestic railway industry.

From the early beginnings of the Department to date, Department members successfully contributed to dozens of realized projects of rail vehicles.

Cooperation with the industry, especially in coach manufacturing, shows that the high technical level and quality has been achieved, which made possible significant export business of domestic companies in the last decades to:

- Hungary,
- Poland,
- former Soviet Union,

STAFF 2 professors, 2 teaching and research assistants

DATE FOUNDED 1946

DISTINGUISHED ALUMNI

- Prof. Svetozar Zorić, first lecturer 1897.
- Prof. Vladimir Farmakovski, First Chief of the Department

COOPERATION WITH FOREIGN UNIVERSITIES

- Vienna University of Technology, Austria
- University of Sheffield, United Kingdom

COOPERATION WITH INDUSTRY

- GOŠA, Smederevska Palanka
- Železnice Srbije, Beograd
- ŠINVOZ, Zrenjanin
- ŽELVOZ, Smederevo
- MSK, Kikinda
- Livnica Kikinda, Kikinda
- Prva petoletka, Trstenik

- Greece,
- Croatia,
- Slovenia,
- Iran.

This experience shows that the collaboration with industry has always given the best results and stimulation for further research and teaching activities as well.

A large number of graduation theses was realized on concrete problems of design, testing and maintenance of railway vehicles. Themes of several master and doctoral theses were initiated by developing problems within projects.

As one of the recent research projects we can mention is the development of elements for energy absorption in collision of railway vehicles, where elements are being shaped, analyzed and tested. Design, calculation methodologies and technology of hydrodynamic gearing for railway traction vehicles are under research as well.

Many analyses and researches are done partially with specific software developed in the Department, such as: gauge calculation, strength FEM calculations in elastic and plastic area, calculations of suspension, calculation of forces in buffing and draw gear in curves, calculation of eigenvalues and calculation of ride stability, derailment safety, guiding forces in curves, wheel wear index etc.

Considering the size of a rail vehicle, most of the Department tests are performed in real service conditions - on track, as well as in railway factories. For these tests, the Department is equipped with all the necessary measuring equipment.

Recently the following tests have been performed:

- determination of the coefficient of flexibility, inclination pole position, center of gravity;
- eigenvalue tests, including eigenvalues of the car body as elastic body, tests of the structure sections buckling, static strength of carbody structure, impact test, test of dynamical behavior according to UIC 518, comfort test UIC 513, air tightness test of the coaches for 200 km/h, etc.

In the laboratory conditions several assemblies were also tested: fatigue test of the bogie frame and bolster beam, tests of different rubber elements, axle box water tightness, crashworthiness of elements for passive safety etc.

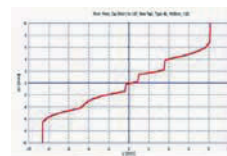
Tel: +381 11 3370 351

Fax: +381 11 3370 364

E-mail: vlucanin@mas.bg.ac.yu

Web site: www.mas.bg.ac.yu/obrazovanje/odseci/zm/odseci-zm.html

Full Professor:
Dr. Vojkan Lučanin.
Assistant Professor:
Dr. Goran Simić.
Teaching and Research Assistants:
Mgr. Ivan Aleksić, Mgr. Dragan Milković.





General Machine Design

The Department of General Mechanical Design deals with machine system components that are of great importance for all mechanical engineering domains, and for the design of machines and their components. In the structure of modules that exist at Faculty of Mechanical Engineering, this is the domain of main importance.

The Department covers education and research fields of general sense of Machine Design. These are Machine elements (gears, bearings, fasteners, etc.), Fracture (fatigue, endurance, strength), Vibration and noise generation, Design of machine systems (product development, optimization, etc).

Departmental courses provide a broad basis of knowledge, practical and analytical skills needed to become a successful engineer.

The Department has been a component of the Faculty of Mechanical Engineering since the Faculty was founded, and we are proud to be

one of the most active research departments in Serbia.

Experimental research is performed in laboratories oriented to testing objects or to testing various phenomena:

- Laboratory for gears and gear drives
- Laboratory for bearings
- Laboratory for fatigue and strength
- Laboratory for vibration and noise.

RESEARCH

Research in the area of Machine elements predominantly contains gears and a gear drive which includes bearings, shafts, couplings, fasteners, springs etc. Belt and chain drives, friction drives are also a part of the Department interest. Research is mainly experimental. Gear research includes gear teeth geometry, durability, endurance, strength, service stresses (stress spectrums) etc. Also, gear research is oriented to generation of vibration and to noise emission of gear drives. For the purpose of gear testing the eight testing rigs are developed and used for the kind of testing. The main action principle "back to back" provides efficient testing process in duration until failure of tested component. This testing rig was used for testing different kinds of rotating components. For the purpose of bearing testing and inspection a few testing rigs are prepared and used. Testing of bearing load capacity, friction, operating characteristics was carried out. Bearing quality inspection is special activity oriented to the market needs.

Research in the area of fracture contains testing of failure probability of gears, screws, connecting rods and other machine parts. For this purpose besides back to back systems, hydraulic pulls machines are applied. The new pulls machine is

purchased. Research in the area of failure theory contains processes before crack arises and hypothesis of damage accumulation.

Research by applying numerical methods contains modelling and FE analysis for the stress conditions determination and for natural vibration analysis (modal analysis).

Research in the area of Machine design contains methods in product development, design parameters optimization etc. For the purpose of optimization, a set of multicriterion optimization including genetic algorithm optimization is available.

The students are welcome to be introduced with research activities, especially experimental work at the Department. The students can become familiar with designs and testing methods, and make some simple experiments by themselves.

We got a license for machine elements testing for industrial and market purpose (LIMES-Laboratory for machine elements and systems testing).

STAFF 8 professors and 2 teaching and research assistants.

DATE FOUNDED 1919

DISTINGUISHED ALUMNI

- Academician Prof. Vladimir Farmakovski
- Prof. Dušan Vitas

COOPERATION WITH FOREIGN UNIVERSITIES

- Technical University Braunschweig, Germany
- University of Erlangen-Nurnberg, Germany
- University of Bologna, Italy
- Technical University Karlsruhe, Germany
- Vienna University of Technology, Austria

COOPERATION WITH INDUSTRY

- IMR Belgrade
- Goša, Smederevska palanka
- TENT, Obrenovac

Tel: +381 11 3302 473

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Email: rmitrovic@mas.bg.ac.yu

Web site: omk.mas.bg.ac.yu/



Full Professors:

Dr. Miodrag Janković, Dr. Milosav Ognjanović, Dr. Mileta Ristivojević, Dr. Radivoje Mitrović, Dr. Božidar Rosić.

Assistant Professors (Dozents):

Dr. Aleksandar Marinković, Dr. Tatjana Lazović.

Teaching and Research Assistants:

Mgr. Zoran Stamenić, Mgr. Dragiša Skoko.



Engineering Materials and Welding, Tribology, Fuels and Combustion

Education and research activities of the Department, include three engineering areas: Engineering Materials and Welding; Tribology; Fuels and Combustion.

ENGINEERING MATERIALS AND WELDING

The historical significance of materials science in Serbia is recognized since 1895, when the course of Mechanical Technology and Department were introduced at the Technical Faculty of the Great School. Since WWI, this course is being advanced up to present day. Over the last 100 years, material scientists have made unprecedented advances in developing revolutionary materials that shape everyday life. The advanced materials (polymers, ceramics, composites, biomaterials and nano-materials) are a few examples of materials that have a fundamental impact on life in the 21st century. In designing a structure or a device, it is quite a challenge to the engineer to select from a vast number of materials, those that suit best the intended purpose. Mistakes can cause disasters. Material characteristics have to be considered when selecting a material. It is not only a matter

of design properties, but often service behaviour of materials plays a dominant role (creep, fatigue and corrosion etc.) causing rupture. Therefore, microstructure, material properties and service behaviour are the keywords in understanding engineering materials. Management of material microstructure enables modification of different properties and service behaviour by applying different treatments and processings. An important aspect of our activities is also welding science. Research activities of the Laboratory of Engineering Materials and Welding include: service behaviour and testing of all kinds of engineering materials; remaining life, structural integrity & reliability and failure of components; welding and deposition procedures. Our activities include a large number of completed projects, mostly for industrial applications and research. A total of over 150 projects include 5 international and also 5 EUREKA projects being realized.

TRIBOLOGY

Tribology Laboratory (TriboLab) is dedicated to education and research in all the aspects of tribology. Interdisciplinary character of the tribology and presence of tribological processes in most of mechanical systems demand researches in all fields of industry, where tribological activities can achieve significant technical and economical effects. The main research activities of TriboLab are: Friction and wear characteristics of materials (metals, polymers and ceramics) and their improvements – coatings and composite materials; Lubricants – application, recycling and monitoring. Lubrication systems and failure diagnostic of tribomechanics systems. TriboLab realized a great number of projects financed by the Serbian Government or Serbian industry

and one by the EU:EUREKA project E!3240 Automobile Steel Material Parts Substitution With Aluminium (ASMATA). The members of the staff have cooperation with the universities abroad mainly through the Balkan Tribological Association. TriboLab is one of the founders of Serbian Tribology Society.

FUELS AND COMBUSTION

Fuels and Combustion Laboratory (FCL) is unique in Serbia due to the extensive education and wide research activities comprising: Characterization of fossil and alternative fuels; Experimental and computational research in combustion, energy production and utilization, prediction of emissions, environmental engineering, chemical kinetics, burners and combustors. The FCL has realized numerous research and development projects supported by Serbian Government, Serbian industry, USA DOE and EU, in combustion of lignites, multifuel premixed burners, small scale biomass boilers and furnaces, fluidized bed combustion, micro-gas turbine burners, deSOx and deNOx systems, characterization of pulverized coal, liquid and gaseous biofuels and pollutants formation. The FCL is equipped with modern measuring equipment for velocity, pressure, temperature, flow control, flue gas composition, infra-red thermography, visualization and data acquisition. Besides, FCL has up to date desktop and notebook computers and licensed specialized software (FLUENT, Chemkin).

STAFF 8 professors, 4 teaching and research assistants, 4 associates

DATE FOUNDED 1966

DISTINGUISHED ALUMNI

- Prof. Dušan Veličković

- Prof. Milan Radovanović

COOPERATION WITH FOREIGN UNIVERSITIES

- Institute Karpenko, Ukraine

- Institute for Welding, Timisoara, Romania

- Drexel University, Philadelphia, USA

COOPERATION WITH INDUSTRY

- EPS, Serbia

- US Steel Serbia

Tel: +381 11 3370 375

Fax: +381 11 3370 364

E-mail: vsijacki@mas.bg.ac.yu

Web site: www.mas.bg.ac.yu/obrazovanje/katedre/-nas-pr.html

Full Professors:

Dr. Mirosljub Adžić, Dr. Anđelka Milosavljević, Dr. Aleksandar Sedmak, Dr. Vera Šijački-Žeravčić.

Associate Professors:

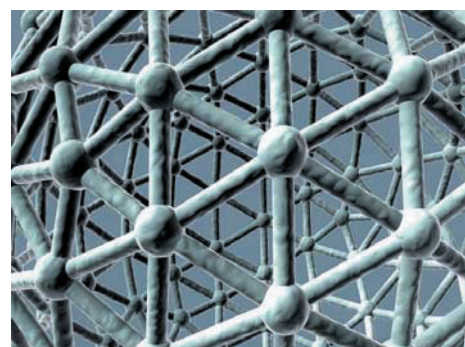
Dr. Radica Prokić-Cvetković, Dr. Dragoslava Stojiljković.

Assistant Professors (Dozents):

Dr. Olivera Popović, Dr. Zoran Radaković.

Teaching and Research Assistants:

Mgr. Gordana Bakić, Mgr. Aleksandar Vencel, Mgr. Miloš Đukić, Mgr. Vladimir Jovanović.



Strength of Structures

Strength of structures consists of peruse and application of numerical and experimental methods necessary for finding stress and strain of statically, dynamically and thermally stressed construction. Finite elements method (FEM) is basic numerical method for structure calculations. Experimental methods of measuring stress are extensio-metric (measuring tape) and photo-elastic. Solids modelling, in other words copying physical into computer model of realistically installed and loaded structure in its exploitation is the main task in researching its strength, as well as strain. Diagnostic of structures' realistic behavior with overcome of its problems rounds the activity of the Department of Strength of Structures. For years, the Department has successfully cooperated in calculations of various constructions with other Faculty departments, as well as with several distinguished, and regionally well-known companies.

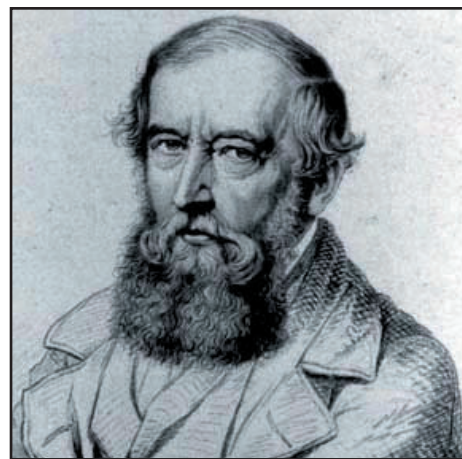
POSSIBILITIES:

- Modelling and computation of the complex constructions and problems.
- Diagnosis of the behavior and the failure of the constructions.
- Reliable forecast of response and work construction in exploitation.
- Determination of the elements for decisions (life cycle, recovery, reconstruction, optimization, verification of the solution, crack propagation).
- Experimental method in construction design.
- Statical, dynamical and thermal analysis.
- Nonlinear analysis.
- Heat transfer analysis.
- Crack and fracture analysis.
- Distribution of the membrane and bending, normal and shear stresses.
- Distribution of the deformation energy.
- Measuring of the stress (optical and strain gages).

APPLICATION FIELDS:

- Ski-lifts
- Excavators
- Plants
- Railway vehicles
- Motor vehicles
- Rotary furnaces and mills
- Steam-boilers
- Cisterns and pressure vessel
- Machines and tools
- Process equipment
- Ship-buildings
- Other constructions.

“Calculating replaces, while geometry stimulates thinking.”



Jacob Steiner (1796-1863)

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Web site: www.mas.bg.ac.yu/obrazovanje/katedre/otpornost-konstr/ok-nas-pr.html

Full Professors:

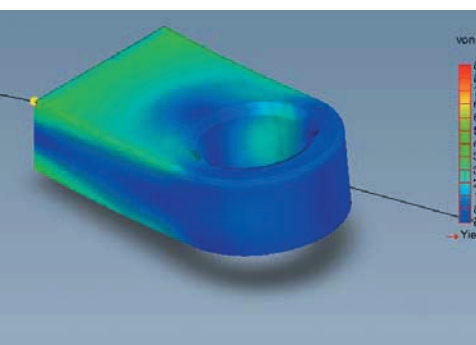
Dr. Taško Maneski, Dr. Milorad Milovančević.

Associate Professor:

Dr. Vesna Milošević-Mitić.

Assistant Professors (Dozents):

Dr. Nina Anđelić, Dr. Momčilo Dunjić, Dr. Igor Balać.



Sports

Students' life is about much more than academic work, and the students' system provides an excellent opportunity for you to get involved in all kinds of sport, and a whole host of other activities alongside your degree.



Faculty of Mechanical Engineering is a big community with a passionate spirit - we encourage involvement and participation at every level, whatever your ability.

Faculty boasts a wide range of sports teams and societies, so from the Mechanical Engineering Students' Association to the Chess Club, the Rugby Club to the Aero Club (EuroAvia) whatever your interests, there is likely to be something to suit you.

The Faculty has a great sporting heritage. We are represented in over thirteen different sports including football, basketball, handball, volleyball, waterpolo, and table tennis, all of which have weekly practices and regular inter-faculty matches.



Since 2006 Faculty is the host to online distance chess match played between Univ. of Belgrade and Univ. of Texas at Dallas. Several of our students are on the University team. Current status off this battle for Trans-Aatlantic Cup is 1:1.



Each spring UB-FME students participate at the regional, mechanical engineering students gathering, famous "Mašinijada".



Our teams are enthusiastically supported by the students who attend all Faculty matches armed with megaphones, banners and loud voices!



Since the first "Mašinijada", our students won the most gold medals!



Activities

Our students excel in music as well as sport, and the Faculty boasts students club which is regularly used for parties and promotions of various things. We have several students and one professors' band



which performs to a high standard and holds regular concerts. Our students are also highly represented in many major University of Belgrade orchestras and choirs.



With several clubs and societies to choose from, students time at the Faculty should never be dull. The range of interests is wide – sports, music, drama, student bulletin, to mention but a few: students main problem will be choosing which societies to join.

Students at the Faculty enjoy a wealth of opportunity to involve themselves in music, as listeners and performers, and at all levels. The University's Orchestra, offers a great range of opportunities, including performances, recitals, masterclasses and coaching. Other organisations within the Faculty cater for almost every other conceivable interest, from soul to jazz, from classical to contemporary.

Regardless of students level of expertise, she/he can become involved in any club or society in which she/he are interested. If a society or team is not available, there is normally support for those wishing to establish one.



When student get to the Faculty a good way of following a current interest or taking up a new one is to join one of the many clubs and societies run by Mechanical Engineering students unions, clubs and societies. The Faculty have over 10 affiliated societies based on the campus, which reflect the wide spectrum of student inter-



ests at the Faculty and include national (eg Arabic), subject (eg Aeromodelling), arts (eg music), religious (eg Orthodox Christian), sports (eg basketball, football, rugby) and general interest societies. The list is ever-changing. Alternatively, if student can not find something that reflects what he is interested in, he can start a society himself – Faculty of Mechanical Engineering offers help and institutional support.





Alumni and Friends (αλμαβ)

ALUMNI - ECHO OF THE QUALITY AND IMPACT

In 2005 UB-FME has established a special enterprise - Foundation of the Faculty, in which Alumni association (αλμαβ) plays an important role. Two conferences were held at the Faculty (Dec.2005,



Oct.2007) and sections throughout Serbia and world are formed. Prof.Dr. Žarko Spasić is leading the collection of valuable data on our Alumni network and more information on activities is available at: [http://alumni.mas.bg.ac.yu \(.rs\)](http://alumni.mas.bg.ac.yu (.rs)), or by [alumni@mas.bg.ac.yu \(.rs\)](mailto:alumni@mas.bg.ac.yu (.rs)).

Alumni contribute to the life of the Faculty in many ways. They maintain a voice in the affairs of the Faculty by becoming representatives on the Faculty Parliament and the Alumni Association Board. Often graduates offer valuable advice during course reviews and help with future recruitment.

UB-FME's alumni also play a vital role in the continuing development of the Faculty through their professional and financial contributions.

CAREERS SUPPORT

Faculty is renowned for its high graduate employment rates. Students have the opportunity, through the Alumni Network and other focused careers events, to benefit from the experience of more than 20,000 former students.

As a graduate student you will also have free access to the Faculty's Careers resources for three years after graduation.

VISITING PROFESSORS



Prof. Konstantinos-Dionysios Bouzakis,
Aristoteles University, Thessaloniki



Univ.-Prof. Dr. Hans-Joachim Bungartz,
TU München, Fakultät für Informatik



Prof. Dr.-Ing. Harald Meerkam,
Friedrich-Alexander-Universität, Lehrstuhl für
Konstruktionstechnik



Prof. Kornel F. Ehmann, Ph.D.
Northwestern University,
Evanston, Illinois
(UB-FME Alumni)



Desimir Jevtić, Ph.D.
Former Serbian Prime Minister



Dragutin Zelenović, Ph.D.
Former Serbian Prime Minister



Aleksandar Šoštar
Olympic gold medalist
Serbian Vice-Minister of Sports



Nebojša Čović, Ph.D.
Former Serbian Vice-Prime Minister,
President, FMP, Serbia



Borivoje Mikić, Ph.D.
Professor, Board of Directors,
Massachusetts Institute of Technology, USA



Nenad Hrisafović, Ph.D.
Architect of Ariane 3, EU, France



Milun Babić, Ph.D.
Former Serbian Minister



Nenad Popović, Ph.D.
President, ABS Holdings, Russia



Dragan Popović
CEO, Thermal Power Plants "Nikola Tesla",
Serbia



Predrag Hrnjak, Ph.D.
Professor,
University of Illinois at Urbana-Champaign,
USA



Srećko Nijemčević
CEO, Ikarbus, Serbia



Dragan Šutanovac
Serbian Minister of Defense



Branislav Grujić
CEO, PSP Farman Holdings, Russia



† Milivoje Simonović, Ph.D.
Former Serbian Minister of Education



Dragan Dilas
Mayor of Belgrade



Dušan Gruden, Ph.D.
Former R&D Director,
Porsche AG, Germany



Radivoje Mitrović, Ph.D.
Former Serbian Minister of Science



Tadija Jurković, Ph.D.
Former Lead Research Engineer,
Opel AG, Germany

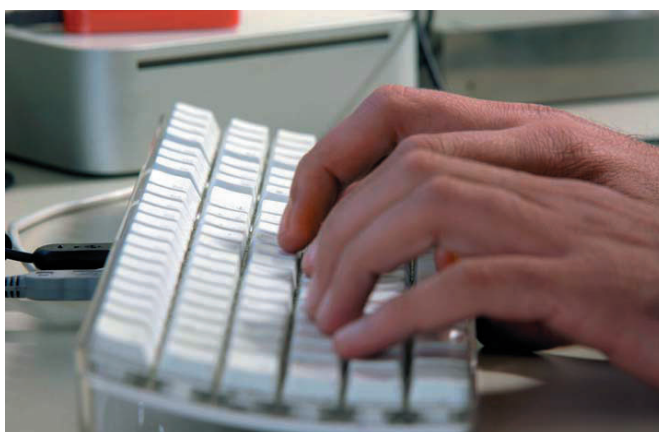
Faculty of Mechanical Engineering apologizes to all other honourable alumni who are not mentioned due to the lack of space.

Innovation Centre

The Innovation Centre (IC) at the University of Belgrade, Faculty of Mechanical Engineering (UB-FME) aims to increase the level of innovation and entrepreneurial capability of Mechanical Engineering students. We hope to foster a culture of innovation by encouraging creative thinking and action; providing enhanced access to entrepreneurship education; and providing business strategy and planning assistance to students.



The vision of IC-UB-FME is: to strengthen Faculty of Mechanical Engineering's reputation for developing entrepreneurial thinking and activity; to encourage continuous learning by involving students (bachelor, master and Ph.D.) in all aspects of the Centre; to develop a one-stop entrepreneurial resource hub for students; to increase student business formations based on non-traditional technology; to use IC's expertise in intellectual property and competitive advantage to accelerate business development; to create economic growth for the local economy.



The main goals and objectives of IC-UB-FME are: to provide various entrepreneurial resources for students; to facilitate cross-campus collaboration on entrepreneurial projects; to provide real experience through entrepreneurial co-ops; to increase economic development in Serbia through student start-ups arising from the Centre and Business Technology Incubator; to promote partnerships between Mechanical Engineering students and local industry.

Business Technology Incubator

www.bitf.rs



The Business & Technology Incubator has been established as a partnership between the four technical faculties of the University of Belgrade (Mechanical, Civil, Electrical and Technological/Metallurgical Engineering), the Municipality of Palilula and the Democratic Transition Initiative. The project has also received support from the Organization for Security and Cooperation in Europe (OSCE).

Establishment of Incubator based on international experiences and best practices has the following goals:

- To encourage and support students in starting up their own businesses and keep them stay in Serbia
- To develop a pool of young and well trained entrepreneurs who will in the future create a new business core of the city
- To create the conditions for practical application of the results obtained through science and research activities of university professors and their associates, by spinning-off private enterprises and transfer of knowledge and technologies.



The aim of the Incubator is to give support in the early stages of business development in the form of subsidized overhead (office and research space and technological and telecommunication infrastructure), administrative assistance (legal, accounting, etc.), as well as business counseling (planning, management, marketing, etc.).

The Incubator has been given its own space in the Campus of Technical Faculties Belgrade (old building of the Faculty), Ruzveltova 1A, second floor and will provide 400+1000 square meters of space to selected businesses.



Entrepreneurship Certificate appropriation, BITF, Sept. 2008



Hours weekly	1 st year		2 nd year		3 rd year	
	1 st	2 nd	3 rd	4 th	5 th	6 th
1	Mathematics 1	Mathematics 2	Mathematics 3	Thermodynamics B	Fluid mechanics B	Electrical and electronics engineering
2						
3						
4						
5	Mechanics 1	Basics of strength of constructions	Mechanics 2	Mechanics 3	Numerical methods	Control engineering
6						
7						
8						
9	Constructive geometry and graphics	Engineering graphics	Machine elements 1	Machine elements 2	Manufacturing technology	Elective course 6.3.5
10						
11						
12						
13	Strength of materials	Engineering materials 1	Engineering materials 2	Elective course 4.4.5	Elective course 5.4.5	Elective course 6.4.5
14						
15						
16						
17	Physics and measurements	Basics of sociology and economics	Elective course 3.5.5	Mechanical engineering praxis	Elective course 5.5.5	Final course with a report (B.Sc. work) 6.5.5
18						
19						
20						
21	English 1	English 2	Elective course 3.5.5	Mechanical engineering praxis	Elective course 5.5.5	Final course with a report (B.Sc. work) 6.5.5
22						
23						
24						
25	Programming	Computational tools	Elective course 3.5.5	Mechanical engineering praxis	Elective course 5.5.5	Final course with a report (B.Sc. work) 6.5.5

Bachelor Studies - ECTS-180

In Diploma certificate of B.Sc. studies, the **title: Bachelor of Science (B.Sc.)** from the Latin **Baccalaureus Scientiæ** in **Mechanical Engineering – three year studies** will be stated. A Diploma Supplement will contain a list of courses the student has attended and passed exams in, and possibly the name of a specialization area when student has earned it by choosing a prescribed group of courses. A student may or may not have a certain specialization area. Abbreviations: B.Sc.ME or BSc ME.

Master Studies - ECTS-120

In Diploma certificate of M.Sc. studies, the **title: Master of Science (M.Sc.)** from the Latin **Magister Scientiæ** in **Mechanical Engineering** (Dipl.-Ing. in Serbian) will be stated.

A Diploma Supplement will contain a list of courses the student has attended and passed exams in, as well as the name of the obligatory specialization module from a certain department he/she has taken and completed. Abbreviations: M.Sc.ME or MSc ME.

Courses of elective modules are given in the section on **Study Modules**.

Hours weekly	1 st year		2 nd year	
	1 st	2 nd	3 rd	4 th
1	COURSE OF ELECTIVE MODULE 1.1.5	COURSE OF ELECTIVE MODULE 2.1.5	COURSE OF ELECTIVE MODULE 3.1.5	Master (M.Sc.) thesis (Diploma work) 4.9
2				
3				
4				
5				
6	COURSE OF ELECTIVE MODULE 1.2.5	COURSE OF ELECTIVE MODULE 2.2.5	COURSE OF ELECTIVE MODULE 3.2.5	
7				
8				
9				
10				
11	Mechanics M or Fluid mechanics M 1.3.5	COURSE OF ELECTIVE MODULE 2.3.5	COURSE OF ELECTIVE MODULE 3.3.5	
12				
13				
14				
15				
16	Thermodynamics M or Mechatronics 1.4.5	Elective course 2.4.5	Elective course 3.4.5	
17				
18				
19				
20				
21	Elective course 1.5.5	Elective course 2.5.5	Elective course 3.5.5	
22				
23				
24				
25				
		Skill praxis M of elective module 2.8		

ECTS	1 st year		2 nd year		3 rd year	
	1 st	2 nd	3 rd	4 th	5 th	6 th
5	Advanced course of mathematics 1.1	Advanced course of mechanics or fluid mechanics 2.1	Elective course 3.1	Ph.D. thesis proposal preparation	Ph.D. thesis writing	Preparation work on Ph.D. thesis public defense
5	Numerical methods 1.2	Elective course 2.2	Elective course 3.2	Laboratory, research, publication (work on thesis)		
5	OMSR and communication 1.3	Elective course 2.3	Laboratory, research, publication (work on thesis)			
5	Elective course 1.4	Laboratory, research, publication (work on thesis)				
10	Laboratory, research, publication (work on thesis)					
Obligatory teaching work as help in exercises on lower levels of studies						

Doctoral Studies- ECTS-180

In Diploma certificate of Ph.D. studies, the **title: Doctor of Philosophy (Science) (Ph.D.)** from the Latin **Philosophiæ Doctor** in the **field of Mechanical Engineering** will be stated.

A Diploma Supplement will contain date of enrollment, specialization area, a list of courses the student has attended and passed exams in, the data on student's teaching experience, papers published and projects' participation, and finally, the date of Ph.D. thesis defense, thesis title, name of the Mentor (Supervisor), and names of Ph.D. committee members. Abbreviations: Ph.D.ME or PhD ME.

More information about system of studies may be found in Academic Studies Guide (printed booklet or pdf e-version on site).

Admission Procedures and Standards

International students follow essentially the same procedures as all domestic students in applying for admission to the Faculty of Mechanical Engineering. No special admission form is required.

A candidate's cultural background and international experiences are highlighted positively in the selection process, as Faculty continues its historic commitment to cultural diversity.

Undergraduate international students are strongly advised to have a minimum of €5,000 per annum, in addition to fees. Possession of these financial resources is essential for each full calendar year a student spends in Belgrade. The Faculty will not be able to finance students if for any reason their funds from overseas are restricted before the end of their course.

Qualifications for International Candidates

1. Documented achievement in a challenging pre-university program or secondary school.
2. English fluency (students are strongly advised to take TOEFL).
3. Excellent performance on admission test.

When to apply

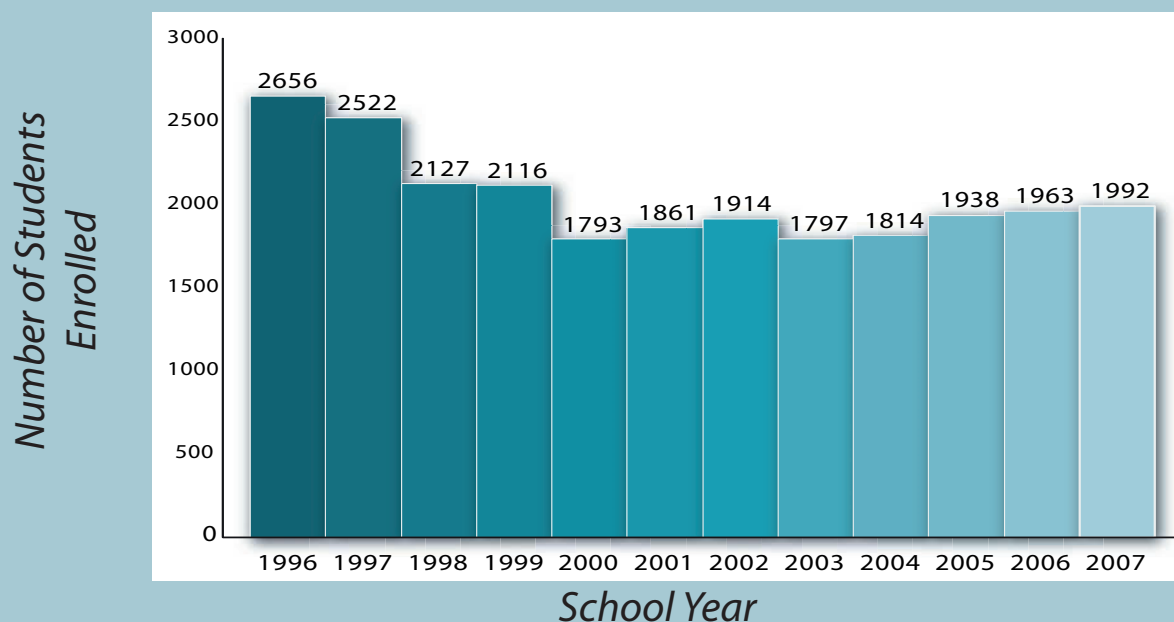
The opening date for applications for admission in October is: 21st June.



Ezddin Ali Farag Hutli
PhD student

“Being an international PhD student, I was a long way from family, friends and home. But, because of people in my surrounding, I was able to adapt quickly to the culture different from my own. Also, my commitment to study as hard as I can, and research opportunities that were given to me, sincere support and guidance of mentor, allowed me to dive deeper into Mechanical Engineering science.”

Student Numbers



The diagram shows the total numbers of enrolled students, i.e. enrolled to all five years of studies.

After passing of the accreditation procedure (Dec.2007 - Apr.2008) of the study programmes, the Faculty is allowed to admit the following maximal enrollment numbers for each year of studies: **540 bachelor, 416 master and 50 doctoral students.** These totals do not include visiting students..

ORGANIZATIONAL STRUCTURE

- Faculty council with its President;
- Dean;
- Vice-deans for teaching process, finances and research and business;
- Heads of chairs - 24 Chairs – 15 specialized and 9 general;
- Heads of laboratories - 30 laboratories, 2 laboratories – accredited by The Accreditation Agency of the Republic of Serbia, 4 laboratories in accreditation process;
- Secretary General, Head of finances, Head of library, etc.;
- Administrative units for students, finances, building maintenance, etc.;
- Library with over 100,000 items;
- Publishing service.

STAFF (AS OF SEPT. 2008)

- Full professors 75
- Associate professors 30
- Assistant professors (Dozents) 37
- T&R Assistants 59
- Researchers 30
- Laboratory personnel 20
- Administrative personnel 160

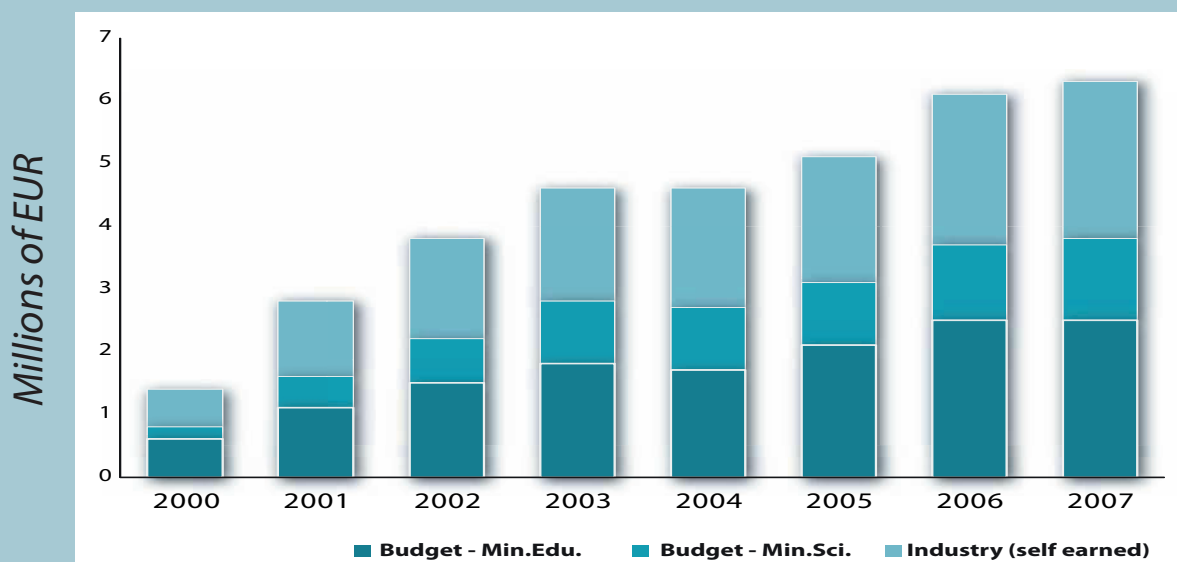
NUMBER OF ALUMNI

1. Dipl.Ing. (5 years of studies): 18,966 (Oct. 1948 - Sept. 2008)
2. Magisters (Mgr.) (2 additional years of study with thesis): 1,387 (Jan. 1966 - Sept. 2008)
3. Doctorates (just defense of theses): 643 (Jan. 1955 - Sept. 2008)

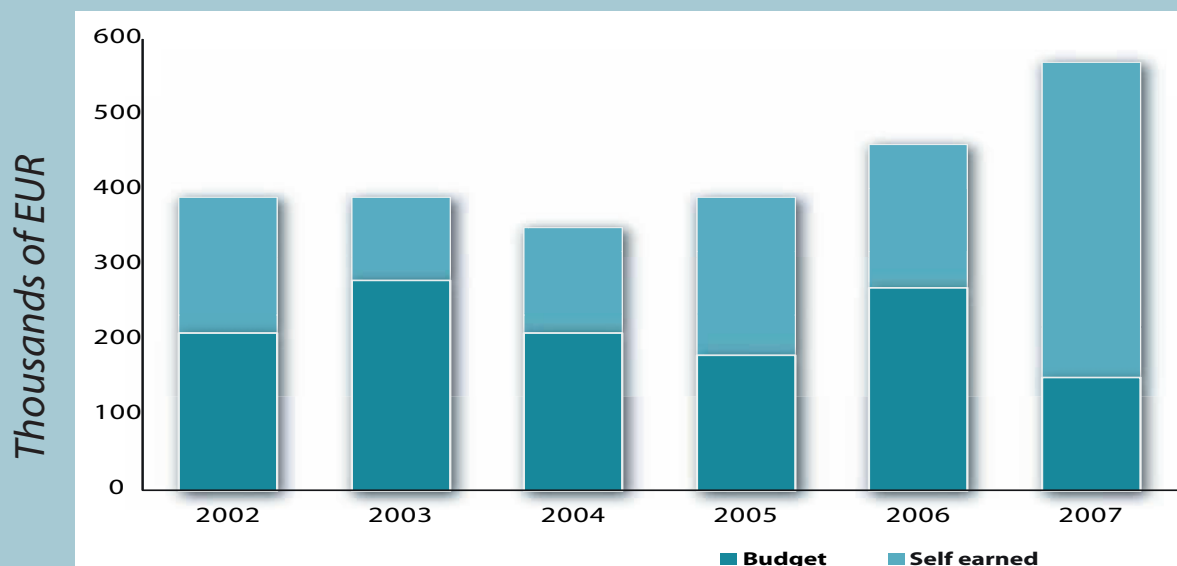
BUILDINGS

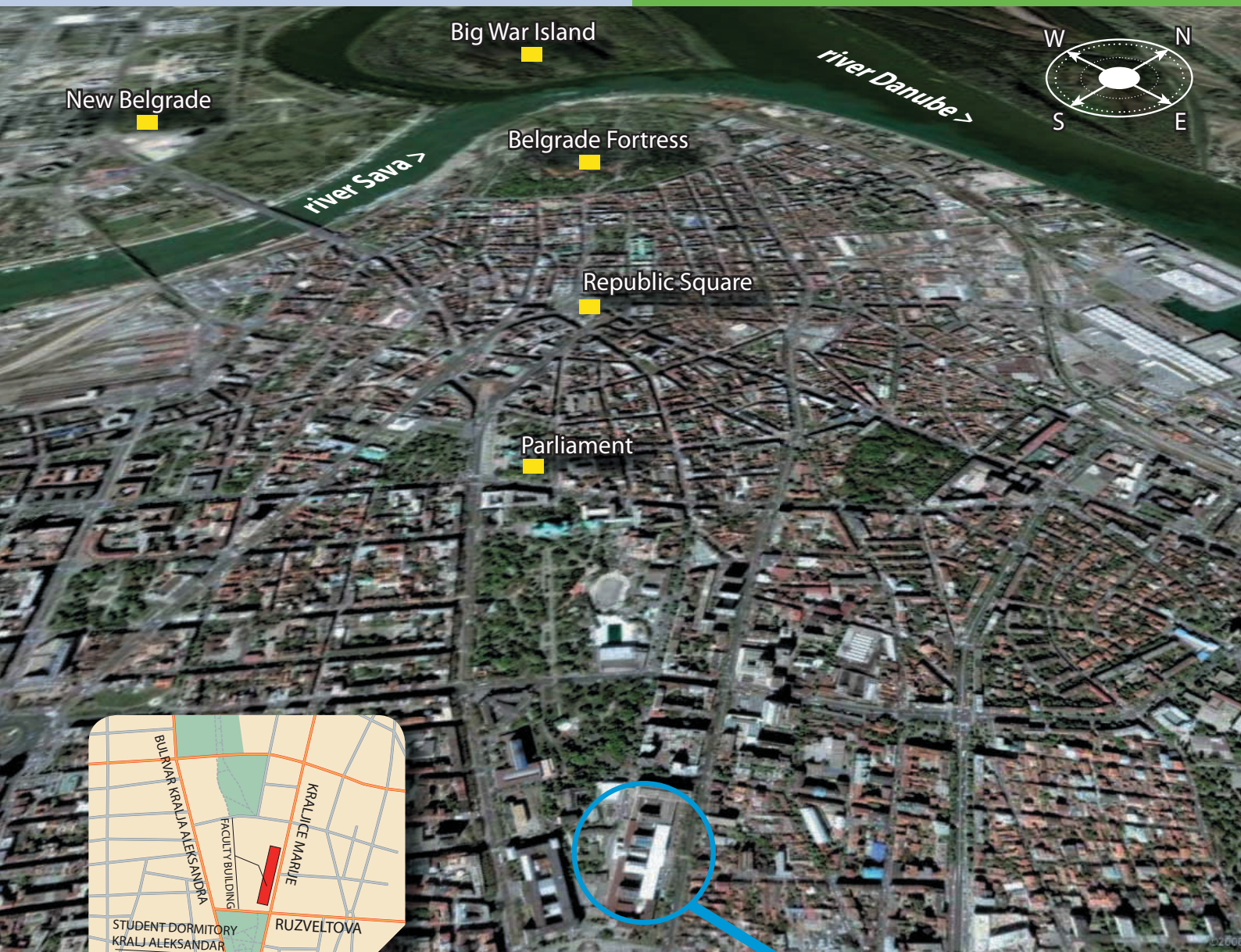
- New building 32,239 m²
- Old building 4,115 m²
- Wind tunnel building 516m²
- Steam power substation building 1,303 m²
- Altogether 38,173 m²
- 30 lecture rooms
- 4 amphitheatres
- 3 celebration rooms
- 4 rooms for numerical laboratories
- 30 laboratories
- 118 offices
- student cafe, cafeteria with bakery, restaurant
- 2 internet alleys with 30 free accesses places

Turnover (Income)



Cost of Operation





HOW TO GET TO THE FACULTY

You can reach the Faculty building in several ways. It depends on how you will get to Belgrade.

If you arrive by:

BUS

Easiest way to get to the Faculty building from Belgrade Bus Station is to take tram no.2 or no.7, direction Bulevar Kralja Aleksandra.

TRAIN

Easiest way to get to the Faculty building from Belgrade Train Station is to take tram no.2 or no.7, direction Bulevar Kralja Aleksandra..

PLANE

Easiest way is to get a cab. Other option is to take a shuttle bus (operated by JAT) which goes every hour, or to take public bus no.72 to Zeleni venac and after that bus no.65 to the Faculty building.



Faculty building

Wind tunnel building

Faculty old building

[www.mas.bg.ac.yu \(.rs\)](http://www.mas.bg.ac.yu (.rs))

How to find out more

Our programmes

To find out more about our programmes, please contact the head of department of your interest listed in the departmental entries in this brochure. Alternatively, take a look at the relevant web pages, which contain details of programme changes and new developments.

Your qualifications

If you have any questions on suitability of your qualifications for a particular programme, please contact our admissions officer listed in the relevant fact-file.

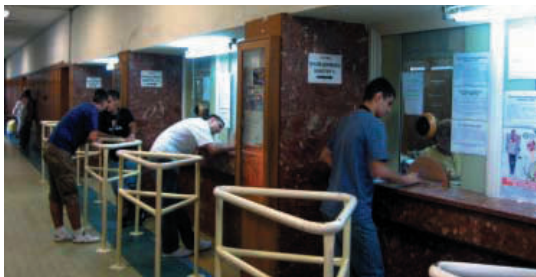
How to apply

If you have general questions about the application process, fee status, or how we will reach a decision, please contact the Faculty:

Tel: +381.11. (33-70-350; 33-70-339; 33-02-251; 33-02-254)

Web: [http://www.mas.bg.ac.yu \(.rs\)/](http://www.mas.bg.ac.yu (.rs)/)

Email: mf@mas.bg.ac.yu, dekan@mas.bg.ac.yu (.rs)



Semester Dates

For full details please see website:

[http://www.mas.bg.ac.yu \(.rs\)/](http://www.mas.bg.ac.yu (.rs)/)

Winter Semester

29 September - 16 January

Spring Semester

9 February - 15 May



Visiting the Faculty

Before you apply

You, your family and friends are welcome to visit the Faculty. Our international admission officer will provide the ideal opportunity not only to go round the building but also to meet the academic staff.

You will have the opportunity to:

1. Go round our buildings;
2. Visit academic departments;
3. Talk to students, lecturers and admissions staff;
4. View accommodation;
5. Try out our catering and enjoy in students' bar;
6. Find out how to apply;
7. Listen to talks on academic subjects, money matters and all aspects of student life.

If you would like to come, please contact us by phone or email and we will arrange the visit.

After you apply

If the department you have applied to offers you a place or an interview (for post-graduate students only), they may invite you to a departmental open day door where you will have the opportunity to meet students and staff and attend specific talks and tours.

For further information please contact us.

